

## STRATEGIES FOR REGULATING THE MOTIVATION OF FUTURE TEACHERS, DEMOGRAPHIC AND ACADEMIC VARIABLES: AN EXPLORATORY STUDY

Sofia Pellisson <sup>1</sup>; Evely Boruchovitch <sup>1</sup>

### ABSTRACT

Motivation regulation strategies are important because they influence the motivation level to begin and complete a task. This research sought to examine whether future teachers report using strategies to regulate their motivation, whether there are relations among these strategies and the participants' demographic and academic life characteristics, and which characteristics of the sample predict the report of using these strategies. Participants were 295 students of different licentiate courses from a public university who responded to a characterization questionnaire and a scale of motivation regulation strategies. Data were analyzed quantitatively using descriptive and inferential statistics. Statistically significant differences were found among motivation regulation strategies reported and students' gender, age, course semester and area of knowledge of the course. It is suggested that these variables be considered in intervention actions to promote the use of motivation regulation strategies among future teachers.

**Keywords:** self-regulation; motivation; teacher education

### RESUMO

As estratégias de regulação da motivação são importantes, porque influenciam o nível de motivação para começar e completar uma tarefa. Esta pesquisa buscou examinar se futuros professores relatam utilizar estratégias para regular sua motivação, se há relações dessas estratégias com as características demográficas e de vida acadêmica dos participantes e quais características da amostra predizem o relato do uso dessas estratégias. Participaram 295 estudantes de diferentes cursos de licenciaturas de uma universidade pública, que responderam a um questionário de caracterização e a uma escala de estratégias de regulação da motivação. Os dados foram analisados quantitativamente pela estatística descritiva e inferencial. Diferenças estatisticamente significantes foram encontradas entre as estratégias de regulação da motivação relatadas e o gênero, a idade, o semestre e a área de conhecimento do curso dos estudantes. Sugere-se que essas variáveis sejam consideradas em ações interventivas para promover o uso de estratégias de regulação da motivação entre futuros docentes.

**Palavras-chave:** autorregulação; motivação; formação de professores

## Estrategias de Regulación de la Motivación de Futuros Profesores, Variables Demográficas y Académicas: Un Estudio Exploratorio

### RESUMEN

Las estrategias de regulación de la motivación son importantes, porque influyen el nivel de motivación para empezar y completar una tarea. En esta investigación se buscó examinar si futuros profesores relatan utilizar estrategias para regular su motivación, si hay relaciones de esas estrategias con las características demográficas y de vida académica de los participantes y cuales características de la muestra predicen el relato del uso de esas estrategias. Participaron 295 estudiantes de licenciaturas de una universidad pública, que respondieron a un cuestionario de caracterización y a una escala de estrategias de regulación de la motivación. Se analizaron los datos cuantitativamente por la estadística descriptiva e inferencial. Diferencias estadísticamente significantes se encontraron entre las estrategias de regulación de la motivación relatadas y el género, la edad, el semestre y el área de conocimiento del curso de los estudiantes. Se sugiere que esas variables sean consideradas en acciones interventoras para promover el uso de estrategias de regulación de la motivación entre futuros docentes.

**Palabras clave:** autorregulación; motivación; formación de profesores

<sup>1</sup> State University of Campinas – Campinas – SP – Brazil; [sofiape@live.com](mailto:sofiape@live.com); [evely@unicamp.br](mailto:evely@unicamp.br)

## INTRODUCTION

The perspective of self-regulated learning stands out in the school and academic context, due to its important contributions to the process of learning to learn. Zimmerman (2002, 2015), one of the main theorists of self-regulation of learning approach, states that self-regulated students actively participate in this process, planning, monitoring, controlling, and regulating their thoughts, feelings, motivations and actions, whenever necessary, to achieve a certain goal.

Students can use strategies to regulate different aspects of their learning (Kim, Brady, & Wolters, 2020; Panadero, 2017). Among them, motivation to learn could be highlighted. Motivation is essential for getting started and continuation of self-regulated learning process, as it encompasses the definition of goals and the perception of competence to carry out a task, interest, value and outcome expectations (Schunk, Meece, & Pintrich, 2008; Wolters, 2011). Considered as a complex and multidimensional construct, motivation can be defined as the process by which activities are instigated and sustained (Schunk et al., 2008). Specifically, in the educational context, motivation refers to the student's willingness to engage and persist in a task (Wolters, 2003).

Motivational regulation can be defined as a set of activities through which individuals act intentionally to initiate, maintain, or supplement their level of motivation, necessary to begin or complete an activity or achieve a specific goal (Wolters, 2003, 2011). It involves the use of strategies, employed intentionally and deliberately to influence motivation, which may be different depending on age, gender, context, and cultural characteristics (Schwinger & Otterpohl, 2017; Wolters, 2003). Among the studies that investigated the relation between the reported use of motivational regulation strategies and gender of higher education students, some revealed that certain strategies were more reported by women (Góes & Boruchovitch, 2017; Schwinger & Otterpohl, 2017; Wolters & Benzon, 2013). On the other hand, others found no significant differences between these two variables (Ljubin-Golub, Petričević, & Rován, 2019). Although some strategies were reported more by History students (Wolters & Benzon, 2013), no significant differences were observed in the students' reported use and area of knowledge of the course (Góes & Boruchovitch, 2017). The impact of variables such as course semester and course time on motivational regulation strategies does not seem to have yet been investigated.

In research by Wolters and Rosenthal (2000), Wolters (2003), and Wolters and Benzon (2013), six motivation regulation strategies most used by students at different levels of education from different countries were identified: self-consequating strategies, environmental structuring, regulation of situational interest, regulation of performance goals, regulation of mastery goals, and regulation of value. More specifically, the self-consequating strategy refers to rewards that

students give to themselves for completing a school task. Environmental structuring strategy is related to reducing distractions and organizing the study environment, aiming for greater concentration to complete the task. The regulation of situational interest concerns the attempt to make the task more pleasant and interesting, increasing immediate pleasure during its completion. Students can associate the tasks with a game or a challenge, trying to show themselves that carrying out the activity can be fun. The regulation of performance goals aimed at good performance consists of using thoughts and internal speech regarding school or academic results, such as thinking about carrying out the task to obtain good grades. The regulation of mastery goals aimed at learning more encompasses the use of thoughts or self-instructions by the student, focused on the importance of carrying out the task, because it is relevant either to develop academic skills or to improve their performance according to criteria established by themselves (Wolters, 2003; Wolters & Rosenthal, 2000). The student then performs the task thinking about the learning it will provide (Schwinger, Von Der Laden, & Spinath, 2007; Schwinger, Steinmayr, & Spinath, 2009). Finally, the regulation of value strategy corresponds to students' effort, through self-verbalizations and self-instructions, to recognize and make the content of the task more interesting, useful or important for their learning (Paulino, Sá, & Silva, 2015a; Wolters & Benzon, 2013).

Using regulatory strategies to sustain or improve motivation can help students stay engaged in academic activities (Bzuneck & Boruchovitch, 2016; Kim, Brady, & Wolters, 2018; Wolters, 2003; Wolters & Benzon, 2013). However, in addition to the quantity of strategies used, it is necessary to evaluate the quality of the strategies to be used. Students who evaluate whether the chosen strategy was effective in improving their motivation tend to be more dedicated and persistent in carrying out tasks, which can have a positive effect on their academic performance (Engelschalk, Steuer, & Dresel, 2017; Grunschel, Schwinger, Steinmayr, & Fries, 2016; Wolters, 2003).

The literature shows that teachers have an important role in promoting the use of these motivational regulation strategies (Schwinger & Otterpohl, 2017; Trautner & Schwinger, 2020; Won, Wolters, & Mueller, 2018). It is up to teachers to know, present these strategies and instruct students to regulate their motivation. However, although this knowledge on the part of the teacher and the future teacher is relevant, and the evidence shows that demographic and academic life variables have an impact on the use of these strategies, it appears that there are few studies that have investigated the motivational regulation strategies among future teachers taking these variables into account (Alonso-Tapia, Abello, & Panadero, 2020; Góes & Boruchovitch, 2017; Kryshko, Fleischer, Waldeyer, Wirth, & Leutner, 2020; Ljubin-Golub et al., 2019; Schwinger & Otterpohl, 2017). Furthermore, national research about this topic is

incipient. In fact, there is only one publication regarding students on teacher education courses. In this sense, the present research aims to: a) examine whether students from different licentiate courses report using strategies to regulate their motivation; b) investigate relationships between motivational regulation strategies, demographic (gender and age) and academic life variables (course, course semester, course time and area of knowledge of the course) of these students; and c) verify which demographic and academic life variables predict the reported use of these strategies.

## METHOD

### Participants

The sample was composed of 295 students from various licentiate courses at a public university located in the interior of the State of São Paulo, Brazil. Of these, 192 were female (64.75%) aged between 18 and 49 years old ( $M=22.83$ ). The most frequent courses were licentiate in Pedagogy ( $n=59$ ; 20.00%), Mathematics ( $n=44$ ; 14.92%), Biological Sciences ( $n=41$ ; 13.90%), Physics ( $n=24$ ; 8.14%) and Physical Education ( $n=23$ ; 7.80%). The majority of courses were in the area of Human Sciences ( $n=116$ ; 39.32%), most students were in their 4th course semester ( $n=51$ ; 17.29%) and full-time/daytime ( $n=187$ ; 63.39%).

### INSTRUMENTS

Two instruments were used to collect the data described next.

#### *Demographic and Academic Life Questionnaire*

This questionnaire was aimed at obtaining information from students about variables: age, gender, course time, course semester and course in which they were enrolled.

*Motivational Regulation Strategies Scale for University Students* (Wolters & Benzon, 2013) - Translated into Portuguese, by Boruchovitch, Góes and Felicori (2016).

This scale aims to understand the different motivation regulation strategies reported by university students to sustain or maintain effort, persistence or the desire to complete an academic task. It consists of 30 Likert-type items with seven response options, which can range from 1 - never to 7 - always. The items are organized into six factors. In factor 1 - Regulation of value (6 items), items refer to the students' effort to make the content more interesting, useful or important to learn and, as an example of an item, it is possible to mention "I make an effort to relate what we're learning to my personal interests." In factor 2 - Regulation of Performance goals (5 items), items represent the tendency of students to remind themselves about the importance of doing a good job or getting good grades in the activities they need to carry out and, as an example of item, one might point out: "I remind myself about how important it is to get good grades." In factor 3 - Self-consequating (5 items), items correspond to the strategies that students report using to self-reward when completing or carrying out a task and, as an example of an item, the following

can be mentioned: "I promise myself some kind of a reward if I get my readings or studying done." In Factor 4 - Environmental structuring (4 items), items reflect the strategies used by students to control or organize the study environment in order to reduce elements that can cause distraction and improve concentration to carry out the prescribed task. As an example of an item, the following can be mentioned: "I change my surroundings so that it is easy to concentrate on the work". In Factor 5 - Regulation of situational interest (5 items), items indicate strategies that try to make studies more enjoyable and fun and, as an example of an item, we have: "I try to get myself to see how doing the work can be fun". In Factor 6 - Regulation of mastery goals (5 items), items concern students' efforts to improve their understanding or learn as much as they can and, as an example of an item, the following can be mentioned: "I challenge myself to complete the work and learn as much as possible." There are no items with reversed scoring, so the higher the student's score in each factor, the more frequent the report of using motivational regulation strategies.

The internal consistency of the scale, measured by Cronbach's alpha, was high for all factors, ranging from 0.77 to 0.91, in a study carried out with 215 students from a university in Texas, in the United States (Wolters & Benzon, 2013). Cronbach's alpha values for the six factors were also high and ranged from 0.79 to 0.92 in the pilot study carried out with 42 Brazilian university students (Góes & Boruchovitch, 2017). Also estimated in the present research, the alpha values for the six factors were similar to those obtained by the original authors and in the study carried out with the Brazilian sample, varying between 0.79 and 0.95.

#### Data collection procedure

Data collection was carried out after the research was approved by the Ethics Committee (CAAE 25584419.6.0000.8142). Initially, the coordinators of the licentiate courses were contacted to present the research to them and to authorize data collection. Due to the Coronavirus pandemic, data was collected online by institutional email and in virtual classrooms during remote classes. Collection by institutional email took place through an invitation sent to students in the months of August 2020 and February 2021. Collections in virtual classrooms were carried out throughout the second semester of 2020 and the first semester of 2021 on days and time agreed in advance with teachers.

The objectives of the research and the absence of losses due to non-participation were explained by the first author during the collections in the virtual rooms and were also written in the invitation sent by email. Participants were then instructed to access a link to a Google Form that directed them to the Free and Informed Consent Form (ICF), the demographic and academic life questionnaire and the scale. Participants should first indicate whether they consented to participate in the research. Afterwards, those who

agreed to participate answered the other instruments. In the virtual rooms, collections lasted approximately 30 minutes. The majority of students participated in collections in virtual rooms (n=237; 80.33%). Student participation by institutional email was much lower (n=58; 19.66%).

### Data analysis

Data were analyzed using the Statistical Analysis System for Windows (SAS System), version 9.2 software. The total values of the scale, the means by factors, by items and standard deviations were calculated. Using the Kolmogorov-Smirnov and Shapiro-Wilk tests, it was verified that the data did not showed a normal distribution. Therefore, the Mann-Whitney non-parametric tests were used to compare the scale scores and the categorical variables gender and course time; and Kruskal-Wallis, to compare scale scores among the variables age, course semester, most frequent courses and area of knowledge of the course. To carry out the comparative analyses, age and course semester were transformed into categorical variables. Furthermore, for these analyses, age, course semester and area of knowledge were grouped as follows: students under 20 years old, between 20 and 29 years old and 30 years

old or over; studying from the 1st to the 3rd course semester, from the 4th to the 7th and from the 8th to the 10th; and Licentiate in Human Sciences, Licentiate in Exact Sciences and Licentiate in Biological Sciences and Health Professions. Spearman's correlation coefficient was used to analyze correlations between motivation regulation strategies and the numerical variables age and course semester. The results of the correlations were interpreted according to the criteria proposed by Cohen (1988). Finally, multiple linear regression analysis (with Stepwise selection criteria), with the variables transformed into ranks, was used to study which demographic and academic life variables predict the report of use of motivational regulation strategies. Cronbach's alpha was used to estimate the internal consistency of the scale.

### RESULTS

Table 1 presents data relating to students' self-reports regarding the use of motivational regulation strategies, with the total values per factor and the most and least reported items in each factor.

The highest scores were found in Factor 1 - Regulation of value (M=5.10) and the lowest in Factor 5 - Regulation of situational interest (M=2.96). The item with the

**Table 1 - Descriptive Statistics of Participants' Scores by Factor and by Items on the translated to Portuguese version of Motivational Regulation Strategies Scale for University Students of Wolters and Benzon (2013).**

	Average	S.D.	Minimum	Median	Maximum
<b>Factors</b>					
1 - Regulation of Value	<b>5.10</b>	0.95	2.00	5.17	7.00
2 - Regulation of Performance Goals goals	5.00	1.31	1.40	5.00	7.00
3 - Self-consequating	4.09	1.77	1.00	4.20	7.00
4 - Environmental Structuring	4.73	1.07	1.50	4.75	7.00
5 - Regulation of Situational Interest	<b>2.96</b>	1.15	1.00	2.80	6.60
6 - Regulation of Mastery Goals	3.90	1.30	1.00	3.80	7.70
<b>Most reported item by factor</b>					
Regulation of value - item 3	<b>5.27</b>	1.23	1.00	5.00	7.00
Regulation of performance goals - item 11	5.22	1.34	1.00	5.00	7.00
Self-consequating - item 14	4.31	1.88	1.00	5.00	7.00
Environmental Structuring - item 20	5.23	1.25	1.00	5.00	7.00
Regulation of sit. interest - item 25	3.92	1.51	1.00	4.00	7.00
Regulation of mastery goals - item 27	4.15	1.66	1.00	4.00	7.00
<b>Least reported item by factor</b>					
Regulation of value - item 5	4.89	1.46	1.00	5.00	7.00
Regulation of performance goals - item 10	4.61	1.60	1.00	5.00	7.00
Self-consequating - item 15	3.84	1.88	1.00	4.00	7.00
Environmental Structuring - item 18	4.43	1.39	1.00	4.00	7.00
Regulation of sit. interest - item 21	<b>1.95</b>	1.32	1.00	1.00	7.00
Regulation of mastery goals - item 30	3.64	1.61	1.00	4.00	7.00

Note. N=295

highest score was from Factor 1 - Regulation of value, item 3 "I make an effort to relate what we're learning to my personal interests" (M=5.27) and the item with the lowest score was from Factor 5 - Regulation of situational interest, item 21 "I make studying more enjoyable by turning it into a game" (M=1.95).

Table 2 presents results of the comparative analyses between the scale scores and the students' categorical variables.

According to results in Table 2, statistically significant differences were found between the report of use of motivational regulation strategies and some demographic and academic life variables of the students.

Female participants mentioned using significantly more strategies from factors 2 – Regulation of Performance Goals (Z=4.09; p=0.001) and 3 - Self-consequating (Z=2.43; p=0.015). Students in the Human Sciences area reported using significantly more strategies from factor 3 - Self-consequating (X<sup>2</sup>=6.44; p=0.040) than those in the Exact Sciences area. Students over 30 years old obtained significantly higher scores in factors 4 – Environmental Structuring (X<sup>2</sup>=8.71; p=0.013) and 6 – Regulation of Mastery Goals (X<sup>2</sup>=7.79; p=0.020). Participants who were in the initial semesters (1st to 3rd) reported using significantly more strategies from Factor 2 – Regulation of Performance Goals (X<sup>2</sup>=9.33; p=0.009). Furthermore,

**Table 2** Scores of the Total Sample on the translated to Portuguese version of Motivational Regulation Strategies Scale for University Students of Wolters and Benzon (2013) in Relation to Gender, Areas of Knowledge, Age and Course Semester.

Factors	Gender				Areas of knowledge				
	Male n=104; Fem n=191				Humanities n=116; Exact Sciences n=102; Biological n=77				
	Masc	Fem	Z	p*	Humanities	Exact Sciences	Biological	X <sup>2</sup>	p**
Factor 1	4.96	5.18	1.72	0.085	5.13	5.00	5.19	1.97	0.373
Factor 2	4.59	5.22	4.09	<b>0.001</b>	5.20	4.83	4.91	4.32	0.116
Factor 3	3.76	4.28	2.43	<b>0.015</b>	4.34	3.75	4.18	6.44	<b>0.040</b>
Factor 4	4.83	4.67	1.21	0.226	4.73	4.78	4.65	0.39	0.822
Factor 5	2.98	2.95	0.17	0.865	3.10	2.92	2.79	4.22	0.121
Factor 6	3.78	3.96	1.17	0.243	3.97	3.96	3.71	1.60	0.450

  

Factors	Age					Course Semester				
	<20 n=58; 20-29 n=213; >=30 n=24					1-3 n=73; 4-7 n=132; 8-10 n=90				
	<20	20-29	>=30	X <sup>2</sup>	p**	1-3	4-7	8-10	X <sup>2</sup>	p**
Factor 1	5.17	5.09	5.08	0.40	0.818	5.15	5.15	4.99	1.15	0.563
Factor 2	5.27	4.96	4.70	3.88	0.143	5.24	5.11	4.64	9.33	<b>0.009</b>
Factor 3	4.18	4.13	3.56	2.17	0.338	4.30	4.18	3.80	3.69	0.158
Factor 4	4.72	4.66	5.30	8.71	<b>0.013</b>	4.68	4.70	4.80	0.99	0.609
Factor 5	3.14	2.92	2.84	3.08	0.215	3.10	2.88	2.96	3.19	0.203
Factor 6	3.92	3.82	4.49	7.79	<b>0.020</b>	3.96	3.98	3.72	2.08	0.354

Note. \*p value referring to the Mann-Whitney test. \*\*p value referring to the Kruskal-Wallis test.

there were no statistically significant differences between the factors of the motivational regulation strategy scale and the course and course time variables, revealing that students from different licentiate courses and from both course time declared using motivational regulation strategies in a similar way.

Table 3 presents the results of correlations among numerical variables.

The data in Table 3 indicated negative and weak significant correlations between the scores of factors 2 – Regulation of performance goals (r=-0.189; p=0.001), 3 - Self-consequating (r=-0.153; p=0.009) and 5 - Regulation of Situational Interest (r=-0.134; p=0.022) and age. The older the students, the less likely they were to report using these three strategies. Furthermore, significant

negative and weak correlations were observed between the scores of factors 2 - Regulation of performance goals (r=-0.211; p=0.0003) and 3 - Self-consequating (r=-0.152; p=0.009) and the course semester. Therefore, students tend to report less use of these two strategies as they progress through the course semesters.

In order to better understand the relation between demographic and academic life variables with the scores in the translated to Portuguese version of Motivational Regulation Strategies Scale for University Students, multiple linear regression analyses were carried out, considering the variables age, gender, course semester, course time and course knowledge areas as independent variables. The results are presented in Table 4.

**Table 3 - Correlation Indices (r) and Significance Levels (p) Between the Numerical Variables and the Scores of the translated to Portuguese version of Motivational Regulation Strategies Scale for University Students of Wolters and Benzon (2013).**

	Factor 1 Regulation of value	Factor 2 Regulation of performance goals	Factor 3 Self-consequating	Factor 4 Environmental Structuring	Factor 5 Regulation of situational interest	Factor 6 Regulation of Mastery Goals
Age	r= -0.07059 p= 0.2267	-0.18943 <b>0.0011</b>	-0.15286 <b>0.0085</b>	0.06334 0.2782	-0.13363 <b>0.0217</b>	0.03025 0.6048
Course Semester	r= -0.07628 p= 0.1914	-0.21152 <b>0.0003</b>	-0.15203 <b>0.0089</b>	0.03973 0.4966	-0.09287 0.1114	-0.10527 0.0710

Note. N=295. r=Spearman correlation coefficient.

**Table 4 - Multiple Linear Regression for the Subscale Scores of the translated to Portuguese version of Motivational Regulation Strategies Scale for University Students of Wolters and Benzon (2013).**

Selected variables	Categories	Factor 2 – RegulationPerformance goals			Factor 3 – Self-consequating			Factor 5 – Regulation of Situational Interest		
		β (EP)*	Value-p	R <sup>2</sup> Partial	β (EP)*	Value-p	R <sup>2</sup> Partial	β (EP)*	Value-p	R <sup>2</sup> Partial
Gender	Male (ref.)	---			---					
	Female	39.18 (10.04)	<b>&lt;0.001</b>	0.0569	22.44 (10.28)	<b>0.030</b>	0.0156			
Age	Continuous variable (ages)	-0.17 (0.06)	<b>0.004</b>	0.0268	-0.14 (0.06)	<b>0.017</b>	0.0234	-0.13 (0.06)	<b>0.022</b>	0.0179

Note. N=295. \* β: value of the estimate or angular coefficient (slope) on the regression line. EP: standard error of beta. R<sup>2</sup>: coefficient of determination. Factor 2 - R<sup>2</sup> Total: 0.0837, Intercept (EP): 147.12 (12.14), p<0.001. Factor 3 - R<sup>2</sup> Total: 0.0390, Intercept (EP): 154.11 (12.44), p<0.001. Factor 5 - R<sup>2</sup> Total: 0.0179, Intercept (EP): 167.87 (9.92), p<0.001.

It can be seen from Table 4 that gender and age were selected as factors significantly related to the scores on the translated to Portuguese version of the Motivational Regulation Strategies Scale for University Students (Wolters & Benzon, 2013). Apparently, these two variables have predictive potential in relation to the reported use of strategies in Factors 2 – Regulation of performance goals (β=39.18; R<sup>2</sup>=0.0569; p<0.001) and 3 - Self-consequating (β=22.44 ; R<sup>2</sup>=0.0156. Students with the highest scores in these two factors were females and youngers. Furthermore, it was found that age appears to have predictive potential regarding the reported use of Factor 5 strategies – Regulation of Situational interest (β= -0.13; R<sup>2</sup>=0.0179; p=0.022). Students with the highest scores in this factor were the youngest. No significant relationships were observed between any demographic and academic life variables with the scores of factors 1 - Regulation of value, 4 - Environmental Structuring and 6 – Regulation of mastery goals.

## DISCUSSION

The objective of the present study was to examine whether students from different licentiate courses report using strategies to regulate their motivation. The results revealed that, in general, students reported using motivational regulation strategies; however, some strategies were mentioned more than others. The strategies in the Regulation of value factor were the most recommended by participants, while those in

the Regulation of Situational Interest factor appeared less frequently. These strategies were also the most and least reported in research by Kryshko et al. (2020) and Schwinger and Otterpohl (2017), as well as in the pilot study to examine the adequacy of the translated to Portuguese version of the Motivational Regulation Strategies Scale for University Students of Wolters and Benzon (2013) to the Brazilian context (Góes & Boruchovitch, 2017).

The item with the highest average, “I make an effort to relate what we’re learning to my personal interests” seems to indicate that students, in order to maintain their motivation for studying, consider the interest and usefulness of the content to be studied and learned, also relating it to other dimensions of their life than just the academic one (Paulino et al., 2015a; Wolters & Benzon, 2013). Alonso-Tapia et al. (2020) highlight that students’ personal interests may often diverge from the learning objectives proposed by teachers and that, in these cases, a possible alternative would be to rethink the way in which teachers demonstrate the usefulness or relevance of what they intend to teach. Item 21, “I make studying more enjoyable by turning it into a game”, which had the lowest score in the present study, was also the least reported in the study by Góes and Boruchovitch (2017). It is speculated that this strategy requires more time from students, or is probably not known by students in general.

Regarding the second and third objectives of this research, relationships were found between the reported use of motivation regulation strategies and demographic and academic life variables of the participants. It was also found that some variables had predictive potential in reporting the use of these strategies. Female students mentioned more frequently the use of the strategies Regulation of Mastery Goals, Self-consequating and Regulation of Situational Interest. These results are similar to those of the studies by Góes and Boruchovitch (2017) and Schwinger and Otterpohl (2017) and diverge from the research by Ljubin-Golub et al. (2019), who found no relation between the reported use of motivational regulation strategies and gender. However, Schwinger and Otterpohl (2017) emphasize that the literature is still incipient and does not present a consensus about how gender can influence the choice and use of motivational regulation strategies. However, there is evidence that the motivational beliefs of male students differ from those of female students (Roeser, Midgley, & Urda, 1996) and that these beliefs influence regulation of motivation (Wolters & Benzoni, 2013). Furthermore, both in the research by Góes and Boruchovitch (2017) and in the present study, the samples were not balanced in relation to gender, having been composed of a greater number of female participants, which makes it impossible to draw more precise conclusions about the relation between the report of use of motivation regulation strategies and the gender of participants. Thus, the data from the present study signal the need that these relations continue to be investigated in the future research, using gender-balanced samples.

Younger students reported regulating their motivation, using the strategies Regulation of performance goals, Self-consequating and Regulation of Situational interest. However, no research was found that examined this relation in Higher Education. In this sense, it is possible to hypothesize that younger students and those in the initial course semesters may focus on grades and good academic performance, rather than in the value that the learning of the task can provide, even for other areas of their lives. Furthermore, the results indicate that these students try to make the task enjoyable during its execution and use rewards as soon as the activity is completed to motivate themselves.

On the other hand, it is suggested that older students and those in the final course semesters use other ways to influence their motivation to learn, or that they have already adapted better to the demands of Higher Education and, therefore, make use of motivational regulation strategies more moderately. Research in the area of motivation that considered the participants' age and course semester shows that there is less reference to the use of motivational regulation strategies by students who are older students and in more advanced years of their university courses (Paulino, Sá, & Silva, 2015b;

Rufini, Bzuneck, & Oliveira, 2012). Data obtained in the present study seem to indicate that older students and those in the final semesters of their courses may be those who would benefit most from psychoeducational interventions aimed at promoting strategies for regulating motivation to learn.

Finally, Human Sciences students reported using the Self-Consequating strategy more than those in Exact Sciences, indicating that they tend to self-motivate themselves for study tasks through rewards they promise themselves if they complete them. Significant differences between motivational regulation strategies and the participants' course knowledge area were not found by Góes and Boruchovitch (2017).

Although the present study was valuable in identifying motivation regulation strategies most and least reported by future teachers and verifying possible influences between the reported use of these strategies and the demographic and academic life variables of these students, it also had some limitations. Among them, the use of self-report scales, which do not allow establishing causal relations between results and do not measure whether, in fact, the reported strategies were employed. Furthermore, responses can be impacted by social desire, when the participant responds to items trying to make a good impression on the researcher and not in accordance with the way they actually act or would act. Another limitation concerns the gender variable, which was not balanced in this research. Furthermore, the study was carried out with students from a single, renowned public university in Brazil, which may indicate that this sample may be different when compared to students from other institutions. Further, different procedures were used to collect data. Despite the excellent internal consistency of the Motivational Regulation Strategies Scale for University Students (Wolters & Benzoni, 2013) obtained in the present sample, factor analysis of the Brazilian version of this scale has not yet been carried out.

It is hoped that future research will advance knowledge, overcoming the limitations of the present study; that use other forms of measures to investigate whether the reported motivation regulation strategies are truly used by students to improve their motivation for studies, such as observing behavior or by means of activities that involve the application of these strategies. It is also recommended that, when including demographic variables in the analyses, new studies seek more balanced samples, especially in relation to gender and that they extend to students from different Higher Education institutions, from different areas, including courses aimed at teaching. It would also be interesting for further research to include other variables of interest that may be associated with motivation regulation strategies, such as measures of academic performance and procrastination. Thus, it will be possible to assess whether the reported use of these strategies is related

to student performance or time management for studies. Finally, future interventional research should be conducted to promote the teaching of motivation regulation strategies, especially in teacher education courses, as they can favor the learning of these students, as university students, who in turn, will be able to teach them to their future students, thus encouraging their use.

### FINAL CONSIDERATIONS

In general, the students in this research reported using different strategies to regulate their motivation. Among the most reported, students mentioned regulating their motivation for studying, considering the value of the content to be learned beyond the academic learning it can provide, and also relating it to their personal interests. Furthermore, it was evident that some variables seem to have a greater impact on the use of these strategies, especially the age, area of knowledge and course semester of the participants. These findings can be useful for developing intervention programs that seek to teach or improve the knowledge that future teachers have about motivation regulation strategies, directing the work to certain groups of students, for example, focusing the strategies on students in the male gender and in the areas of Exact Sciences and Biology, and also improving the strategies of students of different ages and in all semesters of the courses. In addition to specific interventions, it is considered that this important theme should be included in the curriculum of teacher education courses, since knowing different strategies for regulating motivation and knowing which one works best for each situation can benefit students' academic performance.

It is hoped that this study can inspire the continuation of research on this topic and that the regulation of motivation of students in teacher education courses can be strengthened throughout all course semesters, so that students benefit from it to improve motivation for learning, as students, in the academic context and so that they can encourage the use of motivation regulation strategies during their future teaching practice.

### REFERENCES

- Alonso-Tapia, J., Abello, D. M., & Panadero, E. (2020). Regulating emotions and learning motivation in higher education students. *The International Journal of Emotional Education*, 12(2), 73–89. <https://www.um.edu.mt/library/oar/handle/123456789/65093>
- Boruchovitch, E., Góes, N. M., & Felicori, C. (2016). *Tradução consentida da Motivational Regulation Strategies Scale for University Students (Escala de avaliação das estratégias de regulação da motivação de alunos universitários) de Wolters, C. A., & Benzon, M. B. (2013)*. Manuscrito não publicado. Universidade Estadual de Campinas, São Paulo, SP.
- Bzuneck, J. A., & Boruchovitch, E. (2016). Motivação e Autorregulação da Motivação no Contexto Educativo. *Psicologia Ensino & Formação*, 7(2), 73–84. <https://dx.doi.org/10.21826/2179-58002016727584>
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Routledge. <https://doi.org/10.4324/9780203771587>
- Engelschalk, T., Steuer, G., & Dresel, M. (2017). Quantity and quality of motivational regulation among university students. *Educational Psychology*, 37(9), 1154–1170. <https://doi.org/10.1080/01443410.2017.1322177>
- Góes, N., & Boruchovitch, E. (2017). Escala de avaliação das estratégias de regulação da motivação de alunos universitários: um estudo piloto. *Revista De Estudos E Investigación En Psicología Y Educación*, 1, 169–173. <https://doi.org/10.17979/reipe.2017.0.01.2488>
- Grunschel, C., Schwinger, M., Steinmayr, R., & Fries, S. (2016). Effects of using motivational regulation strategies on students' academic procrastination, academic performance, and well-being. *Learning and Individual Differences*, 49, 162–170. <https://doi.org/10.1016/j.lindif.2016.06.008>
- Kim, Y. E., Brady, A. C., & Wolters, C. A. (2018). Development and validation of the brief regulation of motivation scale. *Learning and Individual Differences*, 67, 259–265. <https://doi.org/10.1016/j.lindif.2017.12.010>
- Kim, Y., Brady, A. C., & Wolters, C. A. (2020). College students' regulation of cognition, motivation, behavior, and context: Distinct or overlapping processes?. *Learning and Individual Differences*, 80, 101872. <https://doi.org/10.1016/j.lindif.2020.101872>
- Kryshko, O., Fleischer, J., Waldeyer, J., Wirth, J., & Leutner, D. (2020). Do motivational regulation strategies contribute to university students' academic success?. *Learning and Individual Differences*, 82, 101912. <https://doi.org/10.1016/j.lindif.2020.101912>
- Ljubin-Golub, T., Petričević, E., & Rován, D. (2019). The role of personality in motivational regulation and academic procrastination. *Educational Psychology*, 39(4), 550–568. <https://doi.org/10.1080/01443410.2018.1537479>
- Panadero, E. (2017). A Review of Self-regulated Learning: Six Models and Four Directions for Research. *Front. Psychol*, 8, 422. <https://doi.org/10.3389/fpsyg.2017.00422>
- Paulino, P., Sá, I., & Silva, A. L. (2015a). Crenças e estratégias da motivação na aprendizagem: Desenvolvimento de uma Escala. *Psicologica*, 58(1), 65–87. [https://doi.org/10.14195/1647-8606\\_58-1\\_4](https://doi.org/10.14195/1647-8606_58-1_4)
- Paulino, P., Sá, I., & Silva, A. L. (2015b). Autorregulação da Motivação: Crenças e Estratégias de Alunos Portugueses do 7º ao 9º Ano de Escolaridade. *Psicologia Reflexão e Crítica*, 28(3), 574–582. <https://doi.org/10.1590/1678-7153.201528316>
- Roeser, R. W., Midgley, C., & Urđan, T. C. (1996). Perceptions of the school psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology*, 88, 408–422. <http://dx.doi.org/10.1037/0022-0663.88.3.408>
- Rufini, S. E., Bzuneck, J. A., & Oliveira, K. L. (2012). A qualidade



- da motivação em estudantes do ensino fundamental. *Paidéia*, 22(51), 53-62. <https://doi.org/10.1590/S0103-863X2012000100007>
- Schunk, D. H., Meece, J. R., & Pintrich, P. R. (2008). Motivation: Introduction and Historical Foundations. In D. H. Schunk, J. R. Meece, P. R. Pintrich (Eds.), *Motivation in education: Theory, research, and applications*. (3th ed., pp. 1–49). Upper Saddle River, N. J.: Pearson.
- Schwinger, M., Otterpohl, N. (2017). Which one works best? Considering the relative importance of motivational regulation strategies. *Learning and Individual Differences*, 53, 122–132. <https://doi.org/10.1016/j.lindif.2016.12.003>
- Schwinger, M., Steinmayr, R., & Spinath, B. (2009). How do motivational regulation strategies affect achievement: Mediated by effort management and moderated by intelligence. *Learning and Individual Differences*, 19, 621–627. <https://doi.org/10.1016/j.lindif.2009.08.006>
- Schwinger, M., Von Der Laden, T., & Spinath, B. (2007). Strategien zur Motivations regulation und ihre Erfassung [Motivational regulation strategies and their measurement]. *Zeitschrift für Entwicklungs psychologie und Pädagogische Psychologie*, 39, 57–69. <https://doi.org/10.1026/0049-8637.39.2.57>
- Trautner, M., Schwinger, M. (2020). Integrating the concepts self-efficacy and motivation regulation: How do self-efficacy beliefs for motivation regulation influence self-regulatory success? *Learning and Individual Differences*, 80, 101890. <https://doi.org/10.1016/j.lindif.2020.101890>
- Wolters, C. A. (2003). Regulation of motivation: Evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist*, 38, 189–205. [https://doi.org/10.1207/S15326985EP3804\\_1](https://doi.org/10.1207/S15326985EP3804_1)
- Wolters, C. (2011). Regulation of motivation: Contextual and social aspects. *Teachers College Record*, 113(2), 265–283. <https://doi.org/10.1177%2F016146811111300202>
- Wolters, C. A., Benzou, M. B. (2013). Assessing and predicting college students' use of strategies for the self-regulation of motivation. *The Journal of Experimental Education*, 81(2), 199–221. <https://doi.org/10.1080/00220973.2012.699901>
- Wolters, C. A., Rosenthal, H. (2000). The relation between student's motivational beliefs and their use of motivational regulation strategies. *International Journal of Educational Research*, 33, 801–820. [https://doi.org/10.1016/S0883-0355\(00\)00051-3](https://doi.org/10.1016/S0883-0355(00)00051-3)
- Won, S., Wolters, C. A., & Mueller, S. A. (2018). Sense of Belonging and Self-Regulated Learning: Testing Achievement Goals as Mediators. *The Journal of Experimental Education*, 86(3), 402-418. <https://doi.org/10.1080/00220973.2016.1277337>
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41(2), 64–72. [https://doi.org/10.1207/s15430421tip4102\\_2](https://doi.org/10.1207/s15430421tip4102_2)
- Zimmerman, B. J. (2015). Self-Regulated Learning: Theories, Measures, and Outcomes. In J. D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences* (pp. 541-546). Oxford: Elsevier. <https://doi.org/10.1016/B978-0-08-097086-8.26060-1>

Received on: June 20, 2022

Approved on: December 3, 2023