

## Emotional self-regulation and affective states of *Stricto Sensu* postgraduate students<sup>1</sup>

### ARTICLE

1

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### Abstract

The objective was to identify the levels of adaptation of emotion regulation strategies and the probabilities of association between emotional self-regulation for sadness, joy and anger, and affective states of graduate students. For this, 58 graduate, master and doctoral students from two programs at a Federal University participated, who filled out a characterization questionnaire and the Life Satisfaction, Positive Affect and Assessment of Emotional Regulation Strategies scales. of Adults. Data were analyzed quantitatively, using descriptive statistics with a measure of central tendency, with the help of SPSS 20 software. The results show that, despite the difference between the number of participants per program, students have used satisfactory strategies, since there was no minimum score on any of the subscales – sadness, anger and fear. When associated with the study categories, it was found that Life Satisfaction has a high positive correlation with Joy and positive Affect. In addition, it is clear that students who had a low feeling of satisfaction with life, do not show animation and engagement in everyday activities. The absence of adaptive strategies for negative emotions tends to directly affect the subjects' positive affect and feelings of well-being. It is suggested the development of new studies, with an enlarged sample and that accompany the formative process of the students, in order to understand the influences of the strategies used in the academic performance.

**Keywords:** Emotional aspects. Adaptive strategies. Academic context.

### Autorregulação emocional e estados afetivos dos estudantes de pós-graduação *Stricto Sensu*

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## Resumo

Objetivou-se identificar os níveis de adaptação das estratégias de regulação emocional e as probabilidades de associação entre a autorregulação emocional para tristeza, alegria e raiva, e estados afetivos de alunos de pós-graduação. Para isto, participaram 58 alunos de pós-graduação, mestrado e doutorado, de dois programas de uma Universidade Federal, os quais preencheram um questionário de caracterização e as escalas de Satisfação com a vida, de Afeto Positivo e de Avaliação das Estratégias de Regulação Emocional de Adultos. Os dados foram analisados quantitativamente, por meio de estatística descritiva com medida de tendência central, com o auxílio do *software* SPSS 20. Os resultados apontam que, apesar da diferença entre o número de participantes por programa, os alunos têm utilizado estratégias satisfatórias, visto que não houve pontuação mínima em nenhuma das subescalas – tristeza, raiva e medo. Quando associadas às categorias de estudo, verificou-se que a Satisfação com a Vida apresenta correlação positiva alta com a Alegria e com o Afeto positivo. Além disso, percebe-se que os discentes que apresentaram baixo sentimento de satisfação com a vida, não demonstram animação e engajamento em atividades do cotidiano. A ausência de estratégias adaptativas para emoções negativas tende a afetar diretamente no afeto positivo e no sentimento de bem-estar dos sujeitos. Sugere-se o desenvolvimento de novos estudos, com amostra ampliada e que acompanhe o processo formativo dos alunos, a fim de compreender as influências das estratégias utilizadas no desempenho acadêmico.

**Palavras-chave:** Aspectos emocionais. Estratégias adaptativas. Contexto acadêmico.

## 1 Introduction

Human well-being can be influenced by various external and internal factors, including relational, cognitive and emotional aspects, among others. The fact that a person passes a selection process, for example, can trigger a positive emotional state that favors their well-being. On the other hand, stressful situations in the workplace tend to cause states of dissatisfaction, triggering negative emotions such as anger (Bandura, 2005).

These aspects are fundamental to the composition of human behavior. Bandura (1999), forerunner of Social Cognitive Theory, states that human behavior is made up of a triad, namely: personal factors - expectations, beliefs, knowledge; environmental factors - resources, physical environment, or even socio-structural; behavior - choices, verbal

statements, course of action. These aspects work in a reciprocal way, i.e. they influence and are influenced by each other (Azzi, 2014).

Bandura (2005) points out that human beings are responsible for their courses of action, playing the role of agent, with characteristics such as proactivity, self-reflection, self-regulation, self-organization and others. In this sense, the individual is capable of acting with intent, anticipating possible outcomes, reacting and reflecting on their practice. These steps help with another construct used by Social Cognitive Theory, Self-Regulation (Bandura; Azzi; Polydoro, 2008).

Self-regulation is a process of managing one's own actions, feelings, motivations or even thoughts in order to achieve a certain goal. This mechanism is internal and can take place consciously or unconsciously. This phenomenon is made up of cognitive sub-processes that guarantee the effectiveness or otherwise of self-regulation: self-observation - which provides important information to support the establishment of achievable goals; judgment - identification of whether a particular action is beneficial or not to the process; self-reaction - consists of action, or not, through the consequences of the performance acquired, i.e. the individual can enjoy self-rewards for having achieved the proposed objective or even remain inactive due to the frustration of a negative result (Bandura, 1991; Bandura; Azzi; Polydoro, 2008; Schunk, 2012; Azzi, 2014).

The personal belief that the individual has about their abilities, together with their skills to achieve a certain result, can enhance the process of self-regulation, given the motivational impulse it can generate. This belief is called self-efficacy by Bandura (1999) and is responsible for determining how people think, feel, motivate themselves and behave (Bandura; Azzi; Polydoro, 2008).

Self-efficacy can be developed through four main sources: direct experience, which is the experience lived and interpreted by the individual themselves; vicarious experience, which is the experience of close and significant people who motivate and inspire the subject; social persuasion, which is the encouragement or criticism of close people; and affective and physiological states, which are changes in mood, emotional state, anxiety, stress and others (Bandura, 1998; Nina, 2015). The level of self-efficacy

belief can influence human behavior and enhance the process of self-regulation, motivating the individual to strive to achieve successful results.

The self-regulation construct is broad and applicable to any context, be it behavioral, academic, motivational, health provider, affective, among others (Zimmerman, 1989; Bandura, 1998; Bandura; Caprara; Barbaranelli, 2003; Bzuneck; Boruchovitch, 2016). With regard to emotional or affective self-regulation - which is the focus of this study - the subject administers and manages their emotions, whether positive or negative, reflecting on the possible consequences of each affective course of action adopted and applying strategies to assist in this process, which can be adaptive or not (Bandura; Caprara; Barbaranelli, 2003; Kopp, 1989).

In this sense, it is worth noting that emotions are innate and subjective reactions of each human being to a given situation and are related to a stimulus that can be internal or external and try to promote physiological, behavioral and cognitive changes (Damásio, 1996; Magalhães, 2013; Sroufe, 1982). Planalp (1999) discusses five factors that make up emotions and their possible reactions, which are: precipitating events - situations that, when assessed by the subject, can be characterized as precursors to a certain emotion; physiological changes - the body's responses to each emotion presented; expression of emotion - which consists of externalizing these responses; regulation of emotion - which is based on managing these emotions and can modify the emotional state presented and also control their physiological reactions.

Cruvinel and Boruchovitch (2019) point out that this flow can be enhanced if the individual reflects on their own emotions, presenting an active and critical conscious stance on the affective behaviors adopted during the process. Garber, Walker and Zeman (1991) corroborate the process of emotional self-regulation when they propose a model, derived from Information Processing Theory, a cognitive perspective for more effective emotional management. This model is made up of five stages: (1) perception of the emotion, when the subject perceives the physical and physiological signs, and identifies the current emotion; (2) identification of the cause that motivated this emotion; (3) setting goals, the individual creates achievable goals and objectives to modify this

emotional state; (4) identification of possible responses, for each stipulated goal the subject must raise possible results in order to solve the problem; (5) evaluation of the results, in this last stage the individual analyzes the results acquired at the end of the process.

Understanding this process and applying it effectively is beneficial in terms of mental health, given that individuals with better affective performance are able to deal with their emotions, achieving success in their social relationships and a sense of satisfaction and well-being with life. However, people who have difficulty regulating themselves emotionally can acquire mental disorders and psychosomatic illnesses (Cruvinel; Boruchovitch, 2019).

There are some strategies that are used in order to enhance, or not, the process of emotional self-regulation. These are known as coping strategies and can be conscious or unconscious, interfering in the emotional state presented in a behavioral and cognitive way: rumination - exhaustive thinking about the emotion presented and the precepting event; pleasurable activities - engaging in pleasurable activities, such as watching films, going for walks and reading, which can bring satisfaction to the individual by improving the negative emotion; externalization - externalizing through physical or verbal aggression such as swearing; social support - seeking affective-social support with friends, family, can promote happy feelings; withdrawal from the event - seeking to move away from the event that provoked negative emotions or even isolation; suppression of expression - the individual seeks to hide the negative feeling; positive re-evaluation of the situation - when the subject resignifies the motivating situation, through a cognitive re-evaluation such as thinking of happy things, thinking it could have been worse, or just not thinking (Gross, 1998; Garnefski; Kraaij; Spinhoven, 2001; Bortoletto; Boruchovitch, 2013; Cruvinel; Boruchovitch, 2019).

These coping strategies can be seen in isolation, with each individual presenting a specific strategy, or they can be related to each other with the aim of achieving effectiveness in the emotional self-regulation process and consequently emotional stability (Bortoletto; Boruchovitch, 2013). Failure in the emotional management process,

also known as "emotional dysregulation", can be related to the use of some non-adaptive strategies, such as: rumination, isolation or lack of reaction, self-mutilation, binge eating, suicide and others (Cruvinel; Boruchovitch, 2019). The use of these strategies can be extremely damaging to the mental health of any individual, causing illnesses such as depression and anxiety and, consequently, compromising performance in the emotional, social and even academic spheres (Caprara et al., 2012).

It is also worth noting that the effectiveness of managing emotions can increase over the years, given the individual's accumulation of experiences and the increase in personal beliefs. Thus, an adult may find it easier to control and manage their emotions than an adolescent who is in the process of forming and maturing their ideas and attitudes (Bandura, 1999).

However, in both age groups, it is necessary to maintain emotional stability, since effective emotional self-regulation can generate a status of satisfaction and well-being with life, which are basic prerequisites for good performance, especially in training and academic aspects. When it comes to training professionals, whether in education or related areas, emotional control is an important factor in learning, favoring the expansion of knowledge (Santos; Primi, 2014).

In the context of postgraduate studies, this management of emotions is fundamental, given the incidence of students with a certain emotional destabilization, anxiety crises, stress, depression, syndromes and others. This illness can cause students to lose interest in continuing the course, affecting their learning process and compromising their professional experience (Brandtner; Bardagi, 2009; Batista et al., 2016).

Many postgraduate students study, work and play important roles in their homes. This situation can emotionally destabilize students if they are unable to self-regulate, causing dissatisfaction with life, compromising basic functions, fragility in well-being and in their interpersonal relationships (Bandura; Caprara; Barbaranelli, 2003). In other words, if a person can manage and control their emotions, they tend to achieve a state of emotional stability and enjoy good results in the professional, educational/academic,

relational and personal areas (Caprara et al., 2012). In this sense, this study aims to identify the levels of adaptation of emotion regulation strategies and the probabilities of association between emotional self-regulation for sadness, joy and anger, and affective states of postgraduate students.

## 2 Method

This article is characterized as quantitative, descriptive and exploratory empirical research, which brings the researcher closer to reality. In addition, quantitative data can make it possible to understand the phenomenon through a larger context, listing common characteristics and describing them in order to analyze and relate them to the research objective (Andrade, 2009; Gatti, 2004).

### 2.1 Locus and participants

Fifty-eight students from two postgraduate programs - at master's and doctoral level - at a federal university took part in the survey. Of the total, 41 (69%) participants are regular students in a postgraduate program in Education (academic master's) and 17 (31%) are master's students in the Postgraduate Program in Public Security (professional). The sample was characterized by convenience, i.e. those who agreed to take part in the research made up the group.

Most of the sample was made up of women (69%), while the remainder (31%) was made up of men. Their ages ranged from 22 to 57. Regarding marital status, the majority (36.2%) of participants reported being married, 27.6% said they were single, 19% in a stable union, 15.5% divorced and the remainder (1.7%) reported widowhood. With regard to occupation, 82.8% of the students work with an average workload of  $\pm$  34.9 h/s. The number of participants who received leave to attend postgraduate courses (41.4%) did not differ significantly from the amount who said they did not receive leave (43.1%), and 17.2% said they were not working at the moment. It is worth noting that the majority of participants (82.8%) do not receive any kind of incentive grant and have to pay for their own research and academic expenses.

## 2.2 Data collection procedures and instruments

The students were informed about the subject and the aims of the research, as well as given the necessary guidance on the collection instruments. Those who were willing to take part received the instruments and assistance as soon as they requested it.

Initially, data was collected from students in the Postgraduate Program in Education, and then from students in the Postgraduate Program in Public Security. The data collection instruments used were:

- i. **Characterization questionnaire:*** Prepared by the authors, made up of closed questions with the aim of obtaining socio-demographic, academic, professional and personal data on the students.
- ii. **Adult Emotional Regulation Strategies Assessment Scale (Boruchovitch; Bortoletto, 2010):*** made up of 92 items, 4-point likert type, and subdivided into three subscales: joy, with 22 items and a score ranging from 22 min to 88 max; sadness and anger, with 35 items each and a score ranging from 35 to 140 points. It should be noted that the higher the score, the more adaptive the strategies the participants used. Cronbach's Alpha coefficient for the overall scale was  $\alpha = 0.82$ , and the scores for the subscales were sadness ( $\alpha = 0.58$ ), joy ( $\alpha = 0.61$ ) and anger ( $\alpha = 0.69$ );
- iii. **Positive Affect Scale (Lent et al., 2011):*** developed through a Social Cognitive Model of Job Satisfaction, it consists of a set of subscales that aim to assess specific factors such as support goals, working conditions, positive affect, among others (Ramos, 2015). The subscale used, which refers to the participants' positive affect, was translated by Azzi, Ferreira and Casanova (2016). It is a Likert-type scale and is measured using 9 items with intervals ranging from 1 (very rarely or never) to 5 (very often). Duffy and Lent (2009) carried out a study in which this scale achieved a Cronbach's Alpha coefficient of  $\alpha = 0.92$ ;
- iv. **Life Satisfaction Scale (Diener et al., 1985):*** Validated by Azzi, Ferreira and Casanova (2016), this scale is also of the likert type and is made up of 5 items ranging from 1 (strongly disagree) to 7 (strongly agree), showing a Cronbach's Alpha coefficient of  $\alpha = 0.88$ , according to Lent et al. (2011).

## 2.3 Ethical aspects

In order to ensure reliability, anonymity and the data obtained, the participants were given a Free and Informed Consent Form, which certifies their interest in taking part



in the research. It is worth mentioning that this study was approved by the Human Research Ethics Committee under CAEE No. 97278718.5.0000.0018.

## 2.4 Data analysis

Three techniques were used to analyze the data obtained: one to test the reliability of the scale in the sample of this study and two techniques to test the associations between the variables: Factor Analysis and Correspondence Analysis.

9

### 2.4.1 Scale Reliability Analysis

Testing reliability is essential to check that the scale is consistent and can reflect the variable being measured. Cronbach's Alpha (Cronbach, 1951) is the common measure used to assess the reliability of a scale. In general, a scale is reliable when the Cronbach's  $\alpha$  value is greater than or equal to 0.70; substantially lower values indicate an unreliable scale.

### 2.4.2 Factor Analysis

The Factor Analysis (FA) technique is a multivariate statistical interdependence technique that seeks to summarize the relationships observed between a set of interrelated variables, in search of common factors (Fávero et al., 2009). The idea is to represent a set of original variables observed in a smaller number of intrinsic factors, whose main objective is to define the underlying structure of a data matrix (Maroco, 2007).

In summary, it can be said that Factor Analysis is a statistical technique used to identify a relatively small number of factors (indices) that can be used to identify relationships between a set of many interrelated variables.

However, in order to apply the technique, a number of assumptions must be met: normality test; analysis of the correlation matrix - values equal to or greater than 0.30; adjustment of the Factor Analysis - analysis of the Kaiser-Meyer-Olkin (KMO) statistic,

whose values range from 0 to 1. The closer the value is to 1, the more suitable the technique is for use. As for the classification of the KMO value, there is a recommendation of Excellent with a value of 0.90 - 1.00; Good with 0.80 - 0.90; Average with 0.70 - 0.80; Fair with 0.60 - 0.70; Poor but still acceptable with 0.50 - 0.60 and Unacceptable with 0.00 - 0.50 (Pestana; Gageiro, 2005; Fávero et al., 2009).

The data was adapted and applied to the multivariate technique, after which Barlett's test of sphericity was carried out, which checks whether the correlation matrix is equal to the identity matrix, and the analysis of the anti-image matrix, which indicates, by means of the Sample Adequacy Measure (SAM), whether the variable studied is suitable for the application of the technique. This means that the closer the coefficient of this measure (MAA) is to 1, the more valid the application of this technique will be. In order to understand whether a variable is significant for the construction of indices (factors), it must have a MAA value equal to or greater than 0.5.

In order to determine the number of equations needed to construct the indices, the Kaiser criterion was used, which makes it possible to determine factors that have eigenvalues greater than 1. Values that do not have this coefficient are discarded from the analysis. The extracted factors are then rotated using the Varimax method, so that every factor can maximize the information of the variables in the indices.

As for the factor scores (indices) for each graduate student, they are calculated by multiplying the individual values assigned to each question, which contain factor weights. This can be better understood after standardizing the values obtained, which can be better evaluated on a scale of 0 to 1 or 0 to 100%. Factor Analysis was carried out using SPSS software, version 24.0.

### 2.4.3 Correspondence Analysis

Correspondence analysis is an interdependence technique used to effectively represent the structure of the data obtained. Its main feature is that it reduces the amount of data analyzed without losing significant information. It also manages to transform rows and columns of tables into units of correspondence, promoting better data representation

and facilitating the construction of graphs. This analysis uses exploratory statistics to verify associations or similarities between study variables, whether they are qualitative or continuous categorical variables (Fávero et al., 2009).

There are two types of Correspondence Analysis, namely: simple - which consists of applying double-entry contingency tables; multiple - which refers to multiple-entry contingency tables. For the analysis to be validated, it is necessary to follow some basic criteria. The first is the chi-square test ( $\chi^2$ ), which verifies the existence of dependence between the study variables (Pestana; Gageiro, 2005). In this case, the hypotheses submitted to the test are: H0: the variables are independent; H1: the variables are dependent.

After rejecting hypothesis H0 in the above test, the chi-square test ( $\chi^2$ ), the  $\beta$  criterion must be calculated, which verifies the dependence between the study variables, testing the hypotheses: H0 - the categories of variables are independent and H1 - the categories of variables are dependent. If the value obtained by  $\beta$  is  $\geq 30$ , it is assumed that hypothesis H0 has been rejected, meaning that the categories of variables are associated with each other.

The second basic criterion for validating the analysis corresponds to calculating the percentage of inertia, which is the variation explained by each dimension. Ramos et al. (2008) state that when simple correspondence analysis is used, the associations between the variables are diffused in a bidirectional plane and for the results to be valid, the sum of the percentage of inertia of the dimensions analyzed, 1 and 2, must be  $\geq 70\%$ . Another important assumption for this type of analysis is the confidence coefficient, which refers to the probability of one variable being associated with another. To do this, a procedure is used based on the difference between the observed and expected frequencies, known as the residual, which is given by (Ramos et al., 2008),

In order to know the probability of one category of variable being associated with another, it is necessary to calculate the confidence coefficient, using a procedure based on the residuals, which is defined by the difference between the expected and observed frequencies.

With the result of the residuals, the confidence coefficient ( $\gamma$ ) is calculated, which makes it possible to check the significance of the residuals. For the associations between the variables to be considered significant, the value of the confidence coefficient must indicate a moderately significant probability - (1) - or a strongly significant probability - ( $\gamma$ )  $\geq 700.00\%$ . The "Statistica" application, version 6.0, was used to carry out the correspondence analysis. In all the tests, the value for rejecting the null hypothesis was set at  $\alpha = 5\%$  ( $p \leq 00.05$ ).

### 3 Results and Discussion

#### Scale Reliability Analysis

Kline (1986) shows that for cognitive tests, such as intelligence tests, a commonly accepted value is 0.80, for ability tests a more appropriate cut-off point is 0.70, when it comes to psychological constructs, values below 0.70 can be expected due to the diversity of constructs being measured.

In the case of the Scale to assess Positive Affect, Satisfaction with life, Joy, Sadness and Anger in postgraduate students, the Cronbach's  $\alpha$  values found were: 0.86 (Positive Affect), 0.81 (Satisfaction with life), 0.62 (Joy), 0.66 (Sadness) and 0.73 (Anger). These constructs, when studied in other contexts, may have different Cronbach's  $\alpha$  values, as in the study by Duffy and Lent (2009) in which the coefficient achieved was equal to  $\alpha = 0.92$ . In the studies by Boruchovitch and Bortoletto (2010) on the evaluation of emotional regulation strategies in adulthood, a study carried out with undergraduate students, the overall alpha value was  $\alpha = 0.82$ , and in the subscales: sadness ( $\alpha = 0.58$ ), joy ( $\alpha = 0.61$ ) and anger ( $\alpha = 0.69$ ). As for the satisfaction construct, the scale by Lent et al. (2011), which had been validated by Azzi, Ferreira and Casanova (2016), reached  $\alpha = 0.88$ . The Cronbach's  $\alpha$  values found in this study do not differ greatly when compared to the above studies. This data is essential to guarantee the consistency of the reliability of the information, which can be built by applying tests or measurement instruments in a

convergent or parallel manner, attesting to the consistency of the scale on the construct studied (Ramos, 2015).

## **Adaptive Strategies - Emotional regulation of sadness, joy and anger in postgraduate students.**

13

The validation study used to verify the levels of adaptation of emotional regulation strategies provides basic information that guided the understanding of the results obtained. Table 1 provides some guidelines on the scoring of the scale used, such as the minimum and maximum values required for each subscale.

**Table 1** - Scoring guidelines for the Adult Emotional Regulation Strategies Assessment Scale, 2019.

Sub-scale	Total items per scale	Minimum estimated by the scale	Maximum estimated by the scale
Sadness	35	35	140
Joy	22	22	88
Anger	35	35	140
<b>Totals</b>	<b>92</b>	<b>92</b>	<b>378</b>

Source: Boruchovitch and Bortoletto (2010).

To identify the levels of adaptation of emotion regulation strategies, the participants' scores on each subscale should be added up: sadness, joy and anger. The higher the score, the more adaptive the strategies used by the students.

The sum of the scores for the three subscales showed that the averages achieved by the participants were different: sadness (86.4), joy (50.3) and anger (86.1). In addition, 29 students (50%) were found to be below average - taking into account the sum of all the points acquired - in terms of the sadness and joy subscales. This was different for the anger subscale, where 30 students (51.7%) scored below average and 28 students (48.3%) scored above average. Overall, the participants showed similar results, i.e. there was a certain balance in the results regarding the adoption of strategies.

When comparing the students' averages by postgraduate program, there was no great disparity. Public safety students scored above average in all three subscales. This is different from the education students, who scored below the average in all subscales (Table 2). It is worth noting that comparing students from the different programs is unfeasible, since there is a big difference in the number of participants from one program to another - 17 students from the Public Safety program and 41 students from the Education program. Table 2 shows this difference and provides a more detailed look at the scores of students in the two programs.

**Table 2** - Number of postgraduate students in education and public safety at the Federal University of Pará, by classification of strategies for controlling sadness, joy and anger, 2019.

Participants	Sadness		Joy		Anger	
	Below average	Above average	Below average	Above average	Below average	Above average
Public Security	6	11	7	10	8	9
Education	23	18	21	20	22	19

Source: Prepared by the authors (2022).

In view of the data, it can be seen that in the sadness subscale all the students from the two postgraduate programs obtained scores higher than the minimum indicated (35 points), which points to a positive reflection, since it may indicate good use of sadness coping strategies. Behaviors such as "thinking about pleasant things" and "praying for the sadness to pass" were used more by the participants, which shows that they used efficient and adaptive strategies to control sadness, as the literature points out (Cruvinel; Boruchovitch, 2019; Gross, 2008).

In the joy subscale, all the students from the two postgraduate programs achieved positive scores - scores above the minimum score of 22 points - although none of the participants reached the maximum level. In order to maintain their cheerfulness, the postgraduates stated that they usually carry out pleasant activities. In addition, they reported that they are able to study better when they are cheerful, i.e. cheerfulness has had a positive influence on their learning process. Maintaining this emotion should be

encouraged, as it tends to prolong feelings of satisfaction and well-being, both physically and psychologically, as pointed out by Cruvinel and Boruchovitch (2010) in a study of children suffering from depression.

With regard to the anger subscale, as with the previous subscales, the students made good use of adaptive strategies - scoring more than the minimum of 35 points - although they didn't score the maximum. The participants stated that they tried to distance themselves from the situation that caused them anger and, in order to reverse this emotional state, they looked for ways to relax and control the emotion. They more often used functional strategies to control anger, which means that the participants recognize the emotion and intend to change this negative emotional state by adopting efficient strategies to do so (Cruvinel; Boruchovitch, 2019).

### **Probability of association between emotional self-regulation for anger, sadness, joy and life satisfaction and affective states.**

Initially, the FA was applied and a considerable number of correlations were obtained with descriptive level values of less than 0.05 (5%) for the variables (questions) used to construct the Self-Efficacy Index, indicating that they are all suitable for the application of the Factor Analysis technique.

The KMO statistic values for Positive Affect (KMO = 0.871), Satisfaction with Life (KMO = 0.724), Joy (KMO = 0.528), Sadness (KMO = 0.508) and Anger (KMO = 0.526) were higher than 0.50, indicating that the Factor Analysis was suitable for the set of variables (questions). In addition, Bartlett's test of sphericity was descriptive ( $p = 0.000$ ), leading to the rejection of the hypothesis that the correlation matrix is an identity matrix. These results support the use of Factor Analysis for the extraction of factors and the estimation of factor scores and subsequently the construction of the Positive Affect, Satisfaction with Life, Joy, Sadness and Anger indices.

Most of the MAA values for the variables (questions) needed to construct the Positive Affect, Satisfaction with Life, Joy, Sadness and Anger indices are individually in

an acceptable range for the application of the Factor Analysis technique, i.e. most MAA values are greater than 0.50.

The factors obtained succeed in restoring: (i) Positive Affect (64.48%), (ii) Satisfaction with life (80.05%), (iii) Joy (73.21%), (iv) Sadness (74.28%) and (v) Anger (64.48%) of the information in the set of variables. However, it is worth remembering that the criterion used to retain the factors was not the %Var returned but the Kaiser criterion.

All the variables (questions) used in the construction of the Positive Affect, Satisfaction with Life, Joy, Sadness and Anger indices have their information satisfactorily returned by the retained factor, as most of the communality values are equal to or greater than 0.30 (30%).

All the variables (questions) used to construct the indices of Positive Affect, Satisfaction with Life, Joy, Sadness and Anger show a majority of moderate correlations ( $r \geq 0.50$ ) with the retained factor (index). In the indices obtained, the positive values of the coefficients of the variables (questions) indicate that the higher the score obtained for a given participant, the greater the Positive Affect, Satisfaction with life, Joy, Sadness and Anger.

After obtaining the indices for Positive Affect (Y1), Satisfaction with life (Y2), Joy (Y3), Sadness (Y4) and Anger (Y5), it was possible to calculate the factor scores for each postgraduate student. Based on the factor scores for each professor, the values obtained were standardized so that they could be evaluated on a scale of 0 to 1 or 0 to 100%.

Once the standardized factor scores for each student had been obtained, they were classified into three different groups. The classification was based on the theory of sample percentiles (Bussab; Morettin, 2013). Therefore, the set of standardized score values was divided as follows: Group 1 - group of postgraduates with the lowest scores (Low Positive Affect, Low Satisfaction with life, Low Joy, Low Sadness and Low Anger); Group 2 - postgraduates with moderate scores (Moderate Positive Affect, Moderate Satisfaction with life, Moderate Joy, Moderate Sadness and Moderate Anger); Group 3 - postgraduates with the highest scores (High Positive Affect, High Satisfaction with life, High Joy, High Sadness and High Anger) (Table 3).



**Table 3** - Sample quartile values for the classification of postgraduate students in education and public security at the Federal University of Pará, based on the standardized scores of the indices of positive affect, satisfaction with life, joy, sadness and anger.

Variable	Classification by Group		
	Bass	Moderate	High
Positive Affect	0 a 22,53%	22,54% a 65,90%	65,91% a 100%
Satisfaction with life	0 a 47,20%	47,21% a 77,44%	77,45% a 100%
Joy	0 a 33,64%	33,65% a 71,64%	71,65% a 100%
Sadness	0 a 33,64%	33,65% a 71,64%	71,65% a 100%
Anger	0 a 39,55%	39,56% a 76,24%	76,25% a 100%

Source: Prepared by the authors (2019).

## Results of the Correspondence Analysis

The values of the descriptive level ( $p$ ) lower than the significance level of 00.05 (5%) and the Beta Criterion ( $\beta$ ) greater than or equal to 30, indicate that both the variables and their categories are dependent (Table 3). Furthermore, it can be seen that the sum of the inertia percentages indicates that more than 70% of the information was returned by the CA. In this way, all the assumptions for using the Correspondence Analysis technique are met. This can be seen from the data presented in Table 4.

**Table 4** - Statistics Resulting from the Application of the Correspondence Analysis Technique to the variables: Positive Affect, Satisfaction with Life, Joy, Sadness and Anger of postgraduate students in education and public safety.

Variables	$\chi^2$	$\beta$	% Inércia	$p$
Positive Affect versus Satisfaction with Life	135,54	65,77	100,0	0,000
Positive Affect versus Joy	120,19	58,10	100,0	0,000
Positive Affect versus Sadness	58,98	27,49	100,0	0,000
Positive Affect versus Anger	11,99	3,99	100,0	0,018
Satisfaction with Life versus Joy	14,22	5,11	100,0	0,003
Satisfaction with Life versus Sadness	29,17	12,59	100,0	0,000
Satisfaction with Life versus Anger	29,17	12,59	100,0	0,000

Joy versus Sadness	121,7 3	58,87	100,0	0,000
Joy versus Anger	141,2 4	68,62	100,0	0,000
Sadness versus Anger	121,4 2	58,71	100,0	0,000

Note:  $\chi^2$  - Chi-Square Value; p - Descriptive Level and  $\beta$  - Beta Criterion Value.

Source: Prepared by the authors (2019)

Table 4 shows that postgraduate students with Low Positive Affect are related to Low Satisfaction with life, Moderate Joy and Moderate Sadness. Postgraduates with Moderate Positive Affect are related to Moderate Satisfaction with life, Low Sadness and High Anger. Postgraduates with High Positive Affect are related to High Satisfaction with life and High Joy.

Of the results found, the following stand out: (i) students with low satisfaction with life also showed low perception of positive affect, i.e. they did not show as much excitement and active engagement in everyday activities; the reverse is also true; (ii) students with more adaptive strategies for regulating joy showed high perception of positive affect and moderate satisfaction with life; (iii) students with less adaptive strategies for controlling sadness showed high and moderate scores for positive affect and satisfaction with life (respectively); (iv) students with more adaptive strategies for controlling anger showed moderate positive affect; (v) students with less adaptive strategies for regulating anger showed moderate satisfaction with life.

Based on these data, it can be highlighted that the negative emotions, sadness and anger, do not seem to affect the feeling of satisfaction with life and well-being of these participants. Despite their negative emotional state, the students said they were able to actively carry out their daily activities, including academic tasks. This picture can be better understood when other external and relational factors are considered which can mediate effective control of emotions and influence the individual's behavior, namely: work environment, support from friends and family, among others (Bandura, 1999). These data are in line with what the literature indicates, when it states that the presence of a negative emotional state can directly affect an individual's performance in both daily

and academic tasks (Caprara et al., 2012; Fried, 2010; Santos; Primi, 2014). Table 5 shows the probability of association between the constructs analyzed.

**Table 5** - Probability of association: (i) between the categories of Positive Affect and the categories of Satisfaction with life, Joy, Sadness and Anger, and also (ii) between the categories of Satisfaction with life and the categories of Joy, Sadness and Anger, resulting from the application of the multivariate statistical technique Correspondence Analysis.

Variable	Category	Positive Affect			Satisfaction with Life		
		Bass	Moderate	High	Low	Moderate	High
Joy	Low	↑	↑	↑	↑	↑	↑
	Moderate	100,00*	↑	↑	95,96*	↑	↑
	High	↑	↑	100,00*	↑	79,35*	↑
Sadness	Low	↑	98,55*	↑	↑	70,85*	↑
	Moderate	99,99*	↑	↑	98,55*	↑	↑
	High	↑	↑	↑	↑	↑	↑
Anger	Low	↑	↑	↑	↑	98,55*	↑
	Moderate	↑	↑	↑	70,85*	↑	↑
	High	↑	70,85*	↑	↑	↑	↑

**Note:** \*Strongly significant probabilities because .

\*\*Moderately significant probabilities, because .

↑ - There was no statistical relationship between these categories

Source: Prepared by the authors (2022).

Table 5 shows that students who indicated more adaptive strategies for controlling anger also used good strategies for maintaining joy and controlling sadness. Students who adopted less adaptive strategies for controlling anger also had the same difficulty with regulating sadness.

Emotional stability is necessary to ensure well-being, feelings of satisfaction and performance in various contexts (Caprara et al., 2012). People who achieve this stability through effective emotion management tend to establish better interpersonal relationships, increasing levels of positive affect and feelings of happiness (Gross; John, 2003). The table below (Table 6) corroborates this information by pointing out the possible associations between the study categories.

**Table 6** - Probability of association: (i) between the categories of Joy and the categories of Sadness and Anger, and also (ii) between the categories of Sadness and Anger, resulting from the application of the multivariate statistical technique Correspondence Analysis.

Variable	Category	Joy			Sadness		
		Low	Moderate	High	Low	Moderate	High
Sadness	Moderate	†	68,27*	†			
	High	†	†	99,91*			
Anger	Low	99,97*	†	†	100,00*	†	†
	Moderate	†	95,45*	†	†	86,87*	†
	High	†	†	100,00*	†	†	100,00*

**Note:** \*\*Moderately significant, because .

\*Strongly significant probabilities, as .

† - There was no statistical relationship between these categories

Source: Prepared by the authors (2022).

The data in Table 6 shows that the participants claim to have effective control over their negative emotions, sadness and anger, as well as being able to adopt positive strategies to maintain happiness, indicating a favorable emotional stability. This stability is fundamental to guaranteeing a sense of physical and psychological well-being, and as a result of this, good performance can be achieved in various contexts, as the students pointed out (Caprara et al., 2012). The opposite can happen if the subject has "emotional dysregulation", i.e. difficulty controlling negative emotions and uses non-adaptive strategies such as isolation, rumination, among others.

As a result, it can be seen that students who indicated more adaptive strategies for controlling anger also used good strategies for maintaining joy and controlling sadness. Students who adopted less adaptive strategies to control anger also had the same difficulty in regulating sadness (Cruvinel; Boruchovitch, 2019). It is essential to achieve effective control of emotions in order to guarantee a sense of well-being and the levels of positive affect that guide the actions and performance of these subjects (Gross; John, 2003).

## 4 Final considerations

Studying the construct of emotional self-regulation is fundamental to understanding aspects of human behavior, such as performance and feelings of satisfaction. This study sought to identify the levels of adaptation of emotion regulation strategies and the probabilities between the variables: emotional self-regulation for sadness, anger, joy and affective states of students from two postgraduate programs.

Although none of the participants achieved a maximum score on the emotion regulation scale, it was noted that the students achieved high scores, some of which were above the established averages and others below the acquired averages. This shows that the students in this study have adaptive strategies, i.e. effective strategies for maintaining a positive emotional state and for controlling and modifying a negative emotional state that can be harmful to psychological health.

It was also noted that negative emotions do not seem to affect the performance of these students, nor their positive affect, such as engagement in postgraduate tasks. This is contrary to what the literature has shown. The small number and disparity between the number of participants were limitations pointed out in this study. For future research, it is suggested that the sample be expanded, considering other postgraduate programs, as well as carrying out a longitudinal survey in order to closely monitor the academic performance of the participants.

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