

# The type of motivation does matter for university preparation

## *O tipo de motivação importa para a preparação da faculdade*

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### Abstract

Using Self-Determination Theory, the relationship between motivation (autonomous and controlled), academic self-efficacy, test anxiety, life satisfaction and academic achievement was studied in a group of pre-university students from Lima-Peru. A total of 252 students of both sexes with ages between 16 and 30 years ( $M_{age} = 17.69$ ) were assessed. Correlational analyses showed the expected relationships among the studied variables. The path analysis performed gave evidence of the fulfillment of the hypotheses proposed for this study since academic self-efficacy mediated the relationship between autonomous motivation and academic achievement and life satisfaction; also test anxiety mediated the relationship between controlled motivation and academic achievement and life satisfaction. The implications of these empirical findings are discussed in relation to pre-university education in Peru.

**Keywords:** Adolescent; Anxiety; Motivation; Personal satisfaction; Self-Efficacy.

### Resumo

*Utilizando a Teoria da Autodeterminação, as relações entre motivação (autônoma e controlada), autoeficácia acadêmica, ansiedade de teste, satisfação com a vida e desempenho acadêmico foram estudadas em um grupo de alunos pré-universitários de Lima-Peru. Foram avaliados 252 alunos de ambos os sexos com idade entre 16 e 30 anos (Média = 17,69). A análise correlacional mostrou as associações esperadas entre as variáveis, e a análise da trajetória mostrou conformidade com as hipóteses propostas, uma vez que a autoeficácia acadêmica mediou a relação entre motivação autônoma, desempenho acadêmico e satisfação com a vida e, por sua vez, a ansiedade de teste mediou*

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a relação entre motivação controlada e desempenho acadêmico e satisfação com a vida. São discutidas as implicações dos resultados empíricos na perspectiva da educação pré-universitária no Peru.

**Palavras-chave:** Adolescente; Ansiedade; Motivação; Satisfação pessoal; Autoeficácia.

In Peru, given the shortcomings of basic education, it is common for most secondary education graduates to have a low educational level (Outes-León et al., 2020). However, parents put a lot of pressure on their children and expect them to be professionals and, therefore, to study in university (Manrique, 2018). Nevertheless, in this transition from secondary to university education, many young people discover that there is a huge gap between the knowledge that they acquired in school and what they need to enter a university (Chávez et al., 2017); and that is why they choose to study in pre-university academies to level themselves up and be able to apply to a university (Manrique, 2018). Currently, there is no information about the student population in pre-university academies, as they are not part of the Peruvian formal education system (Rojas, 2016) that encompasses primary, secondary and university education (Guadalupe et al., 2017).

The pressure on adolescents is exacerbated by the fact that the economic crisis in the country limits access to private university education (Carrillo et al., 2019). This is why most adolescents choose to study in public universities funded by the State, such as *Universidad Nacional Mayor de San Marcos* (UNMSM, National University of San Marcos) and *Universidad Nacional de Ingeniería* (UNI, National University of Engineering) (Manrique, 2018), considered to be the most renowned public universities in Peru (Quacquarelli Symonds, 2020). Nevertheless, entering one of these institutions is not easy. For example, in 2015, just 8.3% (5651) of 67,680 applicants were admitted into UNMSM and just 14.6% (1875) of 12,806 applicants into UNI (Instituto Nacional de Estadística e Informática [INEI], 2015), a situation that forces students to keep applying and continue their pre-university education for periods longer than three years (INEI, 2011).

In these academies, there is a lot of pressure to excel academically: students need to take many subjects to achieve a good performance and obtain an offer of admission in a university, so the academic demand is very high. In addition, the competition among academies is very aggressive given that there are many academies that fight to gain the largest number of applicants accepted into universities since this assures them prestige and, of course, a larger number of students in the future (Manrique, 2018). This makes academy teachers to put a lot of effort and pressure on their students to obtain high grades to get them into a university. Thus, many students are enclosed in a system in which they can be pressured by their families, academy teachers and, of course, by themselves, to meet the expectation of being a university student. But this generalized and constant pressure can actually be harmful as it can produce anxiety, stress, frustration, depression, existential crises, and even suicidal behaviors (Chávez et al., 2017). Therefore, it is clear that for many young people entering a university can be a difficult task that takes a long time, so motivation is required to persist (Ryan & Deci, 2019) and achieve the academic performance (Jeno et al., 2018) needed to be admitted into university (Chávez et al., 2017).

Motivation is the capacity to act that people possess; even by saying, "I am motivated" they express the desire to act out of inspiration (Ryan & Deci, 2017). But motivation also responds to various reasons in human actions, reasons that are studied by Self Determination Theory (SDT) (Deci & Ryan, 2000, 2016). For more than four decades, SDT has studied individuals' internal resources to achieve their potential and regulate their behavior in different aspects of life (Deci & Ryan, 1985; Ryan & Deci, 2017) and has also studied the contextual factors (associated with culture) that impact positively or negatively on the capacity for self-motivation and personal aspirations (Deci & Ryan, 2008; Van den Broeck et al., 2016).

These internal personal resources and environmental factors were initially studied with the traditional distinction of extrinsic and intrinsic motivation to later develop a proposal that details the types of motivation according to their degrees of experience of autonomy (Deci & Ryan, 2016). Hence, SDT introduces the

Organismic Integration Theory (OIT) and replaces this traditional conceptualization with a new one typified by autonomous and controlled motivation (Ryan & Deci, 2017). Autonomous motivation refers to the personal capacity to have volitional experiences, to be able to freely decide one's actions according to genuine interests, while controlled motivation refers to actions that are driven by external or partially internalized contingencies (Ryan & Deci, 2000, 2017). Specifically, OIT proposes a subdivision of motivation associated with the way in which individuals regulate their behavior: external, introjected, identified, and intrinsic (Deci & Ryan, 2000; Ryan & Deci, 2020). These four regulations are studied as a motivational continuum that groups them into two broad categories: controlled motivation and autonomous motivation, which describe different levels of internalization regarding one's will or ownership of one's behavior (Ryan & Deci, 2017; Yu et al., 2018).

In this continuum, external and introjected regulation are brought together into controlled motivation (Domenico & Ryan, 2017; Ryan & Deci, 2017). External regulation is the inclination to act in order to obtain benefits or avoid punishment (Deci & Ryan, 2016), which is evidenced in students who wish to study to obtain some reward (Ryan & Deci, 2020). Introjected regulation describes the pressure that individuals feel in order to feel proud, while avoiding shame and guilt (Deci & Ryan, 2008; Vansteenkiste et al., 2010), such as achieving something to satisfy their ego (Ryan & Deci, 2019).

Then, identified and intrinsic regulation are brought together as part of autonomous motivation (Ryan & Deci, 2020). In identified regulation, individuals act because they understand the importance of what they do (Oga-Baldwin et al., 2017), and this can be seen in pre-university students who consider learning important (Vansteenkiste et al., 2009). And, finally, in intrinsic regulation, individuals act spontaneously (Deci & Ryan, 2000; Domenico & Ryan, 2017), as they feel pleasure, joy or fun when doing something (Deci & Ryan, 2016), and this is shown in adolescents when they study and are free to choose how they learn (Wang et al., 2016).

Self Determination Theory also studied the advantages and disadvantages of each type of motivation. It was able to identify that controlled motivation is harmful, since it reduces commitment, creativity, persistence (Ryan & Deci, 2017), academic self-efficacy (Wang et al., 2016), generating educational maladjustment, drop-outs (Aelterman et al., 2019), superficial learning, and high levels of test anxiety (Vansteenkiste et al., 2010), the latter being specifically detrimental to pre-university students. In contrast, autonomous motivation is beneficial and of better quality as it generates or improves psychological well-being (Domenico & Ryan, 2017; Roth et al., 2019), learning (Deci & Ryan, 2016), persistence (Ryan & Deci, 2019; Skinner et al., 2017), obedience to rules (Aelterman et al., 2019), academic performance (Wang et al., 2016), life satisfaction (Roth et al., 2019; Ryan & Deci, 2016), and reduces test anxiety (Vansteenkiste et al., 2018).

Benefits of autonomous motivation (Deci & Ryan, 2000) have also been found in empirical studies associated with academic self-efficacy (Wang et al., 2016). Academic self-efficacy is the confidence that individuals have in their abilities to perform educational tasks (Bandura, 1994, 1997), which allows predicting an appropriate academic performance (Diseth et al., 2012; Doménech-Betoret et al., 2017). Self-efficacy can even mediate the relationship between motivational variables and academic performance (Honicke & Broadbent, 2016; Wang et al., 2016) and also life satisfaction (Diseth et al., 2012). In addition, academic self-efficacy reduces test anxiety (Roick & Ringeisen, 2017) and favors life satisfaction (Antaramian, 2017; Burger & Samuel, 2017; Toros et al., 2018).

Among the disadvantages of controlled motivation, an increase in test anxiety can be noted (Roick & Ringeisen, 2017). This type of anxiety would reduce the level of attention and the ability to remember what was studied during evaluative situations (Spielberger, 1980) causing students to score low (Sung et al., 2016). In fact, empirical evidence shows that controlled motivation increases test anxiety while autonomous motivation reduces it (Vansteenkiste et al., 2010). On the one hand, this shows that motivational variables are related to test anxiety and test anxiety to academic performance (Vansteenkiste et al., 2010). On the other hand, test anxiety reduces life satisfaction levels (Çikrikci et al., 2018), also evidencing that motivational variables are related to anxiety, which in turn is associated with life satisfaction (Martela et al., 2019).

Likewise, several studies have related the types of motivation (autonomous and controlled) to academic performance in school. For example, on the one hand, controlled motivation is related to superficial learning (Vansteenkiste et al., 2010) and causes low academic performance (Ryan & Deci, 2016; Wang et al., 2016). And, on the other hand, autonomous motivation favors learning (Ryan & Deci, 2016) predicting a better academic performance (Deci & Ryan, 2016).

Finally, as mentioned above, autonomous and controlled motivation are related to life satisfaction. Life satisfaction is an individual's assessment of their life (Pavot & Diener, 1993), of various experiences that they perceive as being positive or negative (Diener et al., 2013; Martínez, 2004). According to studies by Vansteenkiste et al. (2010), controlled motivation negatively affects life satisfaction. But autonomous motivation was associated with a better level of life satisfaction (Guo, 2018; Roth et al., 2019; Ryan & Deci, 2016).

Despite many studies, SDT constructs have not been studied in pre-university adolescents in Lima, a population that has been studied very little (even in Peru), who belong to a very particular educational context that is not part of regular education and that puts a lot of pressure on them to excel (as previously described). In this way, this study aims at correcting this lack of empirical evidence by researching the relationship between types of student motivation (autonomous and controlled), academic self-efficacy, test anxiety, life satisfaction and academic performance in a group of pre-university students.

This study is important as it examines constructs that have been previously studied by SDT (e.g., autonomous and controlled motivation), but in a group of individuals who are exposed to constant pressure and have not been studied before. Thus, this study wishes to hypothesize, as previously stated, that academic self-efficacy and test anxiety mediate the relationship between motivation (autonomous, controlled) and performance and life satisfaction, taking into account that academic self-efficacy and test anxiety have been found to mediate the relationship between motivational variables and the different variables proposed in this study (Diseth et al., 2012; Honicke & Broadbent, 2016; Vansteenkiste et al., 2010; Wang et al., 2016). In addition, the study also poses the question whether it is possible that this high-pressure environment is beneficial to students and that, contrary to the literature, controlled motivation is adaptive. It has been discussed that, in some contexts (e.g., family), control would be beneficial as it would respond to cultural contexts (e.g., collectivism) and precepts (e.g., obedience, loyalty, etc.) to be achieved when people are motivated in a controlled manner (Soenens et al., 2018). However, from a SDT perspective, no evidence has yet been found that controlled motivation can be beneficial, although no specific studies have been carried out on this group of participants who are in such a high-pressure environment.

## Methods

### Participants

Responses from 252 students from a pre-university academy in Metropolitan Lima were collected using a non-probability convenience sampling technique (Etikan et al., 2016). The data was collected over two weeks, and all the students from the classrooms that the academy management determined were surveyed. The questionnaires were applied using a paper and pencil format. Of all the participants, 134 reported being men (53.8%), 115 women (46.2%), and three did not report their sex. Age ranged from 16 to 30 years ( $M_{\text{age}} = 17.69$ ,  $SD = 1.49$ ). A total of 137 students (55.9%) were minors. Of these, 194 (76.9%) were from Lima (the capital city), 56 (22.2%) came from provinces, and two students did not report their place of birth (0.9%). The participants had been studying for a period ranging from less than six months to more than

four years. Of these, 163 (64.7%) had been studying for six months to one year, 64 (25.4%) for one to two years, 19 (7.6%) for two to three years, and six (2.4%) for three years or more.

## Instruments

*Demographic Data* – Information was collected on sex, age, place of birth, and the period of time in pre-university education.

*Academic Motivation Type Scale* (Vansteenkiste et al., 2009) – Used to assess autonomous and controlled motivation. It consists of 16 items, eight for autonomous motivation and eight for controlled motivation. For autonomous motivation, four items were used for identified regulation (e.g., “Because it’s an important decision for me”) and also four items were used for intrinsic regulation (e.g., “Because it’s fun”). For controlled motivation, the external regulation also includes four items (e.g., “Because I’m supposed to do so”) and introjected regulation (e.g., “Because I would be ashamed of myself if I didn’t study”). The items had response options on a Likert scale from 1 to 7 (from “strongly disagree” to “strongly agree”). In Peru, this scale was translated and adapted by Mixan (2015) in a group of university students showing good evidence of validity and reliability. In this study, evidence of validity was analyzed using Exploratory Factor Analysis (EFA) with a principal component extraction (Promax rotation). The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was 0.82 and Bartlett’s test of sphericity was significant ( $\chi^2 = 1279.924$ ,  $df = 120$ ,  $p < 0.001$ ). In this analysis, the bifactor structure of the test was replicated and both components accounted for 45.81% of the total variance (autonomous motivation = 26.52%, controlled motivation = 19.30%). Then, the factor loadings of the items showed values of 0.46 and .85 for autonomous motivation and 0.42 and 0.74 for controlled motivation. Cronbach’s alpha coefficient was 0.82 for autonomous motivation (0.69 for identified regulation and 0.76 for intrinsic regulation) and 0.79 for controlled motivation (0.63 for external regulation and 0.72 for introjected regulation).

*Academic Situations Specific Perceived Self-Efficacy Scale* (EAPESA; Palenzuela, 1983) – It is a unidimensional scale that assesses self-perceptions of efficacy in student’s tasks. It consists of 10 items (e.g., “If I put my mind to it, I believe I have enough ability to achieve a good academic record”) with response options on a Likert scale from 1 to 4 (from “never” to “always”). In Peru, the scale was adapted by Dominguez et al. (2012) confirming its unidimensionality and an adequate level of internal consistency ( $\alpha = 0.89$ ) in an adapted version of nine items. In the present study, the original 10-item version was used, and the results showed good evidence of validity. It was observed that the KMO was 0.92 and Bartlett’s test of sphericity was significant ( $\chi^2 = 1009.966$ ,  $df = 45$ ,  $p < 0.001$ ). The principal component analysis confirmed the unidimensionality of the scale which accounted for 49.54% of the variance; and the factor loadings of the items showed values of 0.47 and 0.81. Finally, Cronbach’s alpha coefficient of internal consistency was 0.88.

*Test Anxiety Inventory* (IDASE; Bauermeister et al., 1983) – This scale assesses the level of anxiety in evaluative situations and has achieved adequate psychometric properties in the United States (Bauermeister et al., 1983). It consists of 20 items (e.g., “The thought that I might do badly interferes with my concentration during exams”), which are answered on a Likert scale from 1 to 4 (from “almost never” to “always”). In Peru, Villegas et al. (2012) replicated its unidimensionality and achieved a good level of reliability for a 19-item version ( $\alpha = 0.95$ ). In the present study, the inventory’s 20 original items were analyzed, gathering good evidence of validity and reliability. Thus, by means of the EFA, the KMO test showed a value of 0.92, and Bartlett’s test of sphericity was significant ( $\chi^2 = 1798.100$ ,  $df = 190$ ,  $p < 0.001$ ). Then, the principal component analysis showed a single factor that accounted for 37.98% of the total variance, and the item factor loadings revealed values between 0.40 and 0.76. The internal consistency was 0.91.

*Satisfaction with Life Scale* (SWLS, Diener et al., 1985) – The scale assesses global life satisfaction. It consists of five items (e.g., “I am satisfied with my life”) with response options on a Likert scale from 1 to 5 (from “totally disagree” to “totally agree” respectively). In Peru, Martínez (2004) found that the items could be organized around a single factor whose internal consistency was 0.81. In this study, the validity analysis was performed with the EFA, the KMO sample fit test was 0.80, and Bartlett’s test of Sphericity was significant ( $\chi^2 = 293.713$ ,  $df = 10$ ,  $p < 0.001$ ). In addition, main component extraction showed a single factor that accounted for 52.07% of the variance. The factor loadings of the items revealed values between 0.61 and 0.83. Finally, Cronbach’s alpha coefficient was 0.76.

## Procedures

Once the sample of students in pre-university academies was determined, the instruments were applied during regular class hours. First, the Informed Consent form was handed out to participants and signed by them according to the ethical criteria of research (Pontificia Universidad Católica del Perú, 2015). Some students were minors; however, the study was carried out according to Law n° 27337 of the Child and Adolescent Code (Congreso de la República del Perú, 2000), which considers adolescents from 16 to 18 as individuals in the full use of their faculties to authorize their participation in the study as they are considered responsible and free to act. This research was approved by the Ethics Committee of Pontificia Universidad Católica del Perú (PUCP, Pontifical Catholic University of Peru), who issued Opinion n° 0263-2016/CEI-PUCP.

## Data Analysis

Initially, the psychometric properties of the instruments were analyzed (principal component analysis and internal consistency). Descriptive (means and standard deviation) and correlation analyses followed. Subsequently, step by step, multiple linear regression analyses were performed to identify predicted relationships among variables. Finally, path analysis was performed using the LISREL 8.5 software (Jöreskog & Sörbom, 2001).

Path analysis is a multivariable method to verify the direct or indirect contributions exerted by a set of independent variables on dependent variables. To assess the model fit studied in the path analysis, Hu and Bentler’s criteria (1999) were considered. These authors suggest using a combination of various fit indexes. Thus, the  $\chi^2$  (chi-square), the RMSEA (Root Mean Square of Approximation), the SRMR (Standardized Root Mean Square Residual) and the CFI (Comparative Fit Index) were used. Values close to 0.06 for the RMSEA and 0.08 for the SRMR show evidence of a good model, and scores equal to or above 0.95 for the CFI show a good model fit, while scores around 0.90 are acceptable (Hu & Bentler, 1999).

## Results

Means, standard deviations and correlations among the variables studied are shown in Table 1. Student’s *t* analysis showed that men reported higher means ( $p < 0.001$ ) of academic self-efficacy than women ( $t(247) = -3.07$ ,  $M_{\text{men}} = 2.83$ ,  $SD_{\text{men}} = 0.52$ ;  $M_{\text{women}} = 2.63$ ,  $SD_{\text{women}} = 0.52$ ). In addition, women showed higher means ( $p < .001$ ) than men when it came to test anxiety ( $t(224.59) = 2.32$ ,  $M_{\text{men}} = 1.97$ ,  $SD_{\text{men}} = 0.49$ ;  $M_{\text{women}} = 2.13$ ,  $SD_{\text{women}} = 0.56$ ). No significant differences were observed between men and women regarding motivation, academic performance, and life satisfaction.

With respect to the correlations among variables (Table 1), the only demographic variable that had a significant relationship with some of the variables studied was age, which correlated positively with autonomous motivation and negatively with external regulation. Autonomous motivation correlated



**Table 1***Means (M), standard deviations (SD) and correlations between the studied variables*

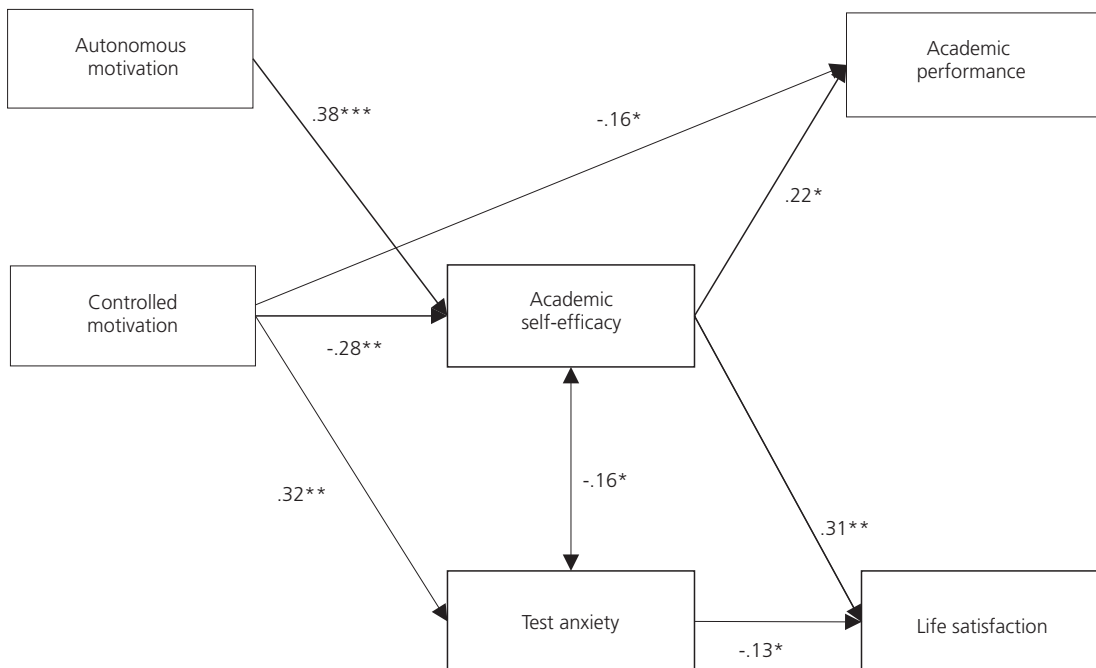
Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1 Autonomous motivation	5.72	0.80										
2 Identified regulation	6.20	0.75	0.85***									
3 Intrinsic regulation	5.24	1.04	0.93***	0.59***								
4 Controlled motivation	3.07	1.14	-0.12*	-0.08	-0.14*							
5 External regulation	2.91	1.17	-0.18**	-0.16*	-0.17**	0.86***						
6 Introjected regulation	3.23	1.37	-0.06	0.00	-0.09	0.91***	0.60***					
7 Academic self-efficacy	2.74	0.53	0.37***	0.31***	0.35***	-0.29***	-0.29***	-0.23***				
8 Test anxiety	2.05	0.53	-0.12	-0.05	-0.15*	0.29***	0.25***	0.26***	-0.32***			
9 Life satisfaction	3.06	0.72	0.22**	0.17**	0.21**	-0.19**	-0.12	-0.21**	0.37***	-0.25**		
10 Academic performance	7.43	2.24	0.18**	0.11	0.19**	-0.20**	-0.17**	-0.19**	0.26***	-0.15*	-0.01	
11 Age	17.69	1.49	0.14*	0.12	0.12	-0.09	-0.13*	-0.03	0.05	-0.03	-0.10	0.10

Note: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

positively with academic self-efficacy, life satisfaction and academic performance, and negatively with controlled motivation. In turn, controlled motivation correlated positively with test anxiety and negatively with academic self-efficacy, life satisfaction and academic performance. In addition, academic self-efficacy correlated positively with life satisfaction and academic performance, and negatively with test anxiety. Test anxiety correlated negatively with life satisfaction and academic performance.

## Path Analysis

The path analysis started by studying the hypothetical model (controlled by sex and age, since both variables showed significant relationships with the variables studied in the model). The hypothetical model

**Figure 1***Path analysis of the studied mediation model*Note: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

(Model 1) revealed the following fit indexes:  $\chi^2 (df = 5) = 15.11, p < 0.01, RMSEA = 0.092, SRMR = 0.035, CFI = 0.95$ . According to Hu and Bentler (1999), some fit indexes are not adequate (e.g., RMSEA).

Since not all fit indexes were adequate, Model 2 was developed to study the direct effects of the motivation variables (autonomous and controlled) on the output variables (academic performance and life satisfaction) as to assess whether these effects, when significant, improved the model fit. Model 2 revealed the following fit indexes:  $\chi^2 (df = 1) = 5.92, p < 0.05, RMSEA = 0.14, SRMR = 0.022, CFI = 0.98$  and as observed again, the RMSEA is far from the optimal fit criteria (Hu & Bentler, 1999).

Given these results, the non-significant paths (to improve the fit indexes) were discarded, and this resulted in Model 3 (the final model), which, in addition to the mediation effects calculated in Model 1, also comprises the direct effect of controlled motivation on academic performance. Model 3 revealed the following fit indexes:  $\chi^2 (df = 7) = 15.91, p < 0.05, RMSEA = 0.073, SRMR = 0.044, CFI = 0.96$ , demonstrating to be fit according to Hu and Bentler's criteria (1999) (Figure 1).

## Discussion

The purpose of this research was to study the relationship among motivation (autonomous and controlled), academic self-efficacy, test anxiety, life satisfaction and academic performance in pre-university students in Lima. SDT and specifically OIT (Deci & Ryan, 2000; Ryan & Deci, 2020) were taken as a reference, whose empirical studies conclude that controlled motivation (of lower quality) has negative effects in educational settings (Deci & Ryan, 2000; Ryan & Deci, 2019), while autonomous motivation (of better quality) favors learning (Deci & Ryan, 2016; Ryan & Deci, 2016). Thus, this study confirms the theoretical relationships suggested by SDT in a sample of students from a pre-university academy who are subjected to a lot of pressure while studying in their attempt to enter a university.

Therefore, the results are consistent with previous studies. Next, some of these similarities with previous research are shown, which validates the findings of this study. Autonomous motivation is negatively related to test anxiety, as Vansteenkiste et al. (2010) found in a group of secondary education students. Autonomous motivation was also found to be positively related to academic self-efficacy and life satisfaction, which is consistent with other studies (Domenico & Ryan, 2017; Ryan & Deci, 2016; Wang et al., 2016). These findings demonstrate the benefits of autonomous motivation in pre-university students who, as explained, are subjected to a lot of stress and discomfort (Chavez et al., 2017).

On the other hand, controlled motivation was observed to be detrimental for pre-university students (and not beneficial as expected in this context), showing negative relationships with academic self-efficacy and academic performance. This result is consistent with Wang's study et al. (2016), who identified that controlled reasons reduced self-efficacy and academic performance in secondary education students in Singapore. Furthermore, as shown in other studies, controlled motivation was found to positively relate to test anxiety and to negatively relate to life satisfaction (Vansteenkiste et al., 2010; Ryan & Deci, 2016). As observed, controlled motivation generates disadvantages in pre-university students by increasing their anxiety and reducing their performance (which is necessary to be admitted into university) (Chávez et al., 2017).

Regarding academic self-efficacy, this variable is positively related to psychological well-being, confirming the studies of Burger and Samuel (2017) and Toros et al. (2018), who concluded that self-efficacy was associated with psychological well-being. Moreover, academic self-efficacy showed a negative relationship with test anxiety and a positive relationship with academic performance (Bandura, 1994, 1997; Roick & Ringeisen, 2017). This is similar to the studies with Peruvian university students by Dominguez et al. (2012), who concluded that the higher academic self-efficacy is, the lower the level of test anxiety and the higher



academic performance are. These findings demonstrate that academic self-efficacy produces optimal conditions for pre-university students to enter university.

Conversely, test anxiety showed a negative relationship with academic performance, demonstrating that high levels of test anxiety are associated with lower academic performance. These results are supported by Sung's research et al. (2016). In addition, test anxiety is negatively related to life satisfaction, which is consistent with studies by Çikrikci et al. (2018) with a sample of 397 secondary education students, in whom they identified that high levels of test anxiety reduced life satisfaction. These findings explain why pre-university students are not admitted into university, scoring low on entrance exams, which increases their levels of discomfort and dissatisfaction with their lives.

According to the path analysis, autonomous motivation has a direct effect on academic self-efficacy and an indirect effect on academic performance and life satisfaction. This is similar to findings in the studies by Diseth et al. (2012), who identified that self-efficacy mediates the relationship between autonomous motivation and academic performance with life satisfaction. In addition, autonomous motivation showed an indirect effect on reducing test anxiety. Even though there is empirical evidence of the benefits of autonomous motivation on academic self-efficacy (Wang et al., 2016) and of the latter on academic performance (Honicke & Broadbent, 2016) and life satisfaction (Antaramian, 2017; Burger & Samuel, 2017; Toros et al., 2018), this finding shows the mediation of academic self-efficacy between autonomous motivation and academic performance in pre-university students, who – while aware of their low academic level (Outes-León et al., 2020) – require their autonomous motivation to be encouraged for developing self-efficacy to improve their performance and psychological well-being (life satisfaction).

As hypothesized, controlled motivation negatively predicted academic self-efficacy and academic performance, but positively predicted test anxiety; furthermore, controlled motivation had an indirect effect mediated by test anxiety by negatively predicting life satisfaction. These results are similar to those of Vansteenkiste et al. (2010), showing that controlling reasons positively predict test anxiety and test anxiety is detrimental to academic performance. Additionally, studies by Martela's et al. (2019) explain that controlled motivation is related to test anxiety and that this variable causes high levels of dissatisfaction with life. Although there is empirical evidence that controlled motivation increases test anxiety (Vansteenkiste et al., 2010) and reduces academic performance (Wang et al., 2016) and life satisfaction (Ryan & Deci, 2016), mediation indicates that, in the pre-university setting, students should be prevented from being guided by controlled reasons, thus avoiding anxiety during entrance exams and being admitted to university.

These results demonstrate the theoretical soundness of SDT given their consistency with its theoretical postulates (Ryan & Deci, 2000) in an academic context that is not usually studied (Chávez et al., 2017). In fact, this is the first research conducted using SDT in this population of students. Probably, the reason why there is no previous research is because usually pre-university academies are hermetic (Rojas, 2016), given that, in many cases, they are criticized as places for training and not for learning, where the important thing is memorizing and not really understanding (Manrique, 2018).

This situation makes an adolescent in an academy aim primarily at improving their performance to "beat others," and be able to enter university; this is clearly an extrinsic goal (Chávez et al., 2017) and usually related to controlled motivation (Deci & Ryan, 2008). Interestingly, in this context, external and introjected regulations together (controlled motivation) fail to achieve a positive effect (Ryan & Deci, 2017), demonstrating that, for pre-university students, these types of regulations come at a cost academically and in relation to their well-being. The results show that regulating behavior in an identified and intrinsic manner (autonomous motivation) is still beneficial for students (Deci & Ryan, 2000), even in this context. However, some might wonder whether it is possible to regulate behavior in an identified and intrinsic manner in

these contexts with a lot of pressure, and the results would indicate yes, as they clearly show the benefits of autonomous motivation on performance and well-being (Diseth et al., 2012). Actually, it is possible that students who focus on these regulations have clearer or more clear-cut interests, and it is also possible that the aspirations of entering university are not related to “making others happy” (Oga-Baldwin et al., 2017), but rather to the achievement of a goal that will allow them, for example, to contribute to their community, their self-realization, etc. (intrinsic goals), as they see university as a space for personal development and growth (Deci & Ryan, 1985).

But don't pre-university students know that academic success in academies leads them to university? It is possible that those in academies who wish to enter university for controlled reasons (Deci & Ryan, 2016; Ryan & Deci, 2020) might not really be convinced that studying is what they see in their future (Vansteenkiste et al, 2009). Although we do not have concrete results to sustain this, it can be observed that there is a negative emotional experience related to these reasons (test anxiety) that prevents academic performance and well-being from increasing (Chavez et al., 2017).

Actually, the results obtained in this study are important, but these are partial results, since there are many variables that could be studied to better understand the effects found in this high-pressure context. Therefore, it is noteworthy that the study has some limitations. Actually, the fact that there are no previous studies on the motivational variables of SDT in this population of pre-university students is a disadvantage. In addition, since this is such a particular population, there is no research from other countries to compare the findings, which is why findings in secondary and university education have been used in this paper.

An important limitation of the study is related to the impossibility of generalizing the results. The study was carried out only in a single pre-university academy when actually there are many others, and although it is possible to imagine that the conditions are the same, this cannot be stated. It would be important to conduct a study with a larger sample of academies and to know a little more about the motivational variables involved in the decision to study at university, such as the teaching styles of the academy teachers and the future aspirations of students. Finally, this research is expected to be the starting point for future studies and contribute to training academy teachers to support their students' autonomy and thus promote their autonomous motivation.

## Conclusion

The applications of SDT in educational contexts focus on identifying the different motivational factors oriented to personal growth and well-being for both teachers and students. Thus, several studies on SDT in school and university contexts at a cross-cultural level confirm the importance of promoting autonomous motivation to optimize learning and well-being, as well as avoiding motivation controlled by different educational and personal disadvantages. Similarly, in this particular sample of pre-university students who are not recognized as part of the formal educational system and who face a stressful academic preparation, the study highlights the importance of promoting autonomous motivation to favor academic self-efficacy, which is necessary to improve the academic performance of students in their university entrance exams and, at the same time, lead to better levels of life satisfaction. In addition, it creates the conditions to guide teachers and students regarding the preconceptions of promoting controlled motivation, thus avoiding the use of reinforcing elements, punishments, or turning to resources that cause students to feel proud or ashamed, as they reduce their levels of academic self-efficacy, increase their levels of anxiety, which finally would prevent them from adequately facing university entrance exams.

## Contributors

I. IRAOLA and L. MATOS contributed substantially to the study idea and design. R. GARGUREVICH, I. IRAOLA, and L. MATOS contributed substantially to the statistical analysis of data. I. IRAOLA contributed substantially to the manuscript preparation. L. MATOS, R. GARGUREVICH contributed substantially to the critical review of the manuscript content. I. IRAOLA, L. MATOS, and R. GARGUREVICH approval of the final manuscript version.

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