ACADEMIC MOTIVATION SCALE: VALIDATION IN PUBLIC HIGHER EDUCATION

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Introduction

The academic motivation of the student of higher education has been the object of several investigations and numerous theories on the subject have been developed, differing in the way in which they perceive or omit personal, social and contextual factors, although they share common concepts and characteristics. The theory of self-determination stands out in the evaluation of the quality and intensity of motivation, described as energy, direction and persistence, as a way of achieving psychological well-being through self-determination (Deci & Ryan, 1985; Menard, Bott, & Crossler, 2017). In this way, the theory of self-determination describes three types of motivation: intrinsic motivation, extrinsic motivation and amotivation (Deci & Gagné, 2005). In turn, associated to the study of motivation have been developed various scales of assessment of motivation in higher education. This research aims at analysing the psychometric properties of the Academic Motivation Scale proposed by Guimarães and Bzuneck (2008), as a contribution to its validation for the Portuguese population and, on the other hand, to know the level of academic motivation in Portuguese public higher education, based on the theory of self-determination.

Self-Determination Theory

(Deci & Ryan, 1985; Deci & Gagné, 2005)

	Intrinsic Motivation	Gratification and interest shown by the individual when exercising an activity of their own volition and their option.
Extrinsic Motivation	Integrated Regulation	Although the individual identifies with the value of the activity, it has no meaning for itself, so that it acts according to what it will achieve with this action.
	Identified Regulation	The individual can feel autonomous even when externally motivated, since he is identified with the purpose of the activity.
	Introjected Regulation	Implies the accomplishment of an activity that does not agree with the individual values, occurring when the individual adopts standards of self-esteem and social approval with which he is not fully identified.
	External Regulation	The inherent action is to obtain a desired result (prestige) or fear of punishment.
	Amotivation	Lack of intention to act, occurring either by the lack of competence to perform the action or by the realization that the realization of the action does not allow the desired results to be obtained.

Methodology

This research aims to know the level of academic motivation in Portuguese public higher education and to analyse the psychometric properties of the Scale of Academic Motivation proposed by Guimarães and Bzuneck (2008) adapted to Portuguese of Portugal, as a contribution to its validation for the Portuguese population. This assessment instrument includes 29 items theoretically divided into three items of intrinsic motivation, four items of Extrinsic Motivation for Integrated Regulatory four items of Extrinsic Motivation by Regulation Identified six items of Extrinsic Motivation for regulation internalized six items of Extrinsic Motivation by Regulation External and six items of demotivation. Like Guimarães and Bzuneck (2008), each item was framed in an affirmative proposition and evaluated on a Likert scale of seven categories (from 1 - No Correspondence to 7 - Total Correspondence). In this context, a quantitative, descriptive and correlational research was developed through the collection of data using an online questionnaire survey applied during the months of May and June of 2018. In this sense, 1157 undergraduate and graduate students were surveyed. (A) (n = 568) and Sample B (n = 589). For the treatment of the data obtained, the statistical programs SPSS 25.0 and AMOS 25.0 were used, and a reference value of 5% was used throughout the statistical analysis.

Results

Factor	Sample A Mean	Sample A Standard deviation	Sample B Mean	Sample B Standard deviation
Amotivation	2.12	1.04	2.12	0.99
Intrinsic Motivation	3.75	1.61	3.72	1.61
Extrinsic Motivation by Integrated Regulation	5.03	1.40	5.07	1.41
Extrinsic Motivation by Identified Regulation	2.99	1.36	2.97	1.24
Extrinsic Motivation by Introjected Regulation	3.32	1.39	3.29	1.32
Extrinsic Motivation by External Regulation	2.66	1.19	2.63	1.14

A **Confirmatory Factorial Analysis** was conducted in Sample A to test a model composed of six correlated factors. The existence of outliers was evaluated by the square distance of Mahalanobis (D2) and the reference values of p1 and p2 (Kline, 2005; Marôco, 2010). Outliers p1 and p2 were lower than .001 and lower D2 to 20, and no outliers were found. It should be noted that, despite the violation of the assumption of continuity and multivariate normality associated with the Likert-type scale, several computational simulation studies show that the results obtained are credible as long as the number of classes of the variable is high and the distribution of class frequencies approaches the normal distribution, which is true (Kline, 2005; Marôco, 2010). The univariate normality was evaluated by the asymmetry (Sk <I3I) and kurtosis (Ku <I10I) coefficients (Kline, 2005; Marôco, 2010), not identifying large deviations from normality. In the analysis, the Maximum Likelihood was used as the estimator.

The results show a reasonable fit of the model, X^2/df **= 4.999, CFI = .818, NFI = .783, RMSEA = .084, 90% CI [. 080, .088],** P **(rmsea <= .05) < .001.** The Extrinsic Motivation Factor by Regulated Identification was removed from the model, since the corresponding indicators do not adequately represent the latent variable (Guimarães & Bzuneck, 2008; Leal, Miranda, & Carmo, 2013) . On the other hand, the elimination of this factor also results in a decrease in AIC, being beneficial to the model (with the Extrinsic Motivation Factor by Regulated Identification, AIC = 1955.517, without the factor, AIC = 1568.262). Therefore, an analysis of the standardized residues and modification indices was carried out, in order to identify possible local sources of this result. Based on this analysis, items 8, 6 and 14 were eliminated and items 28 and 29 were correlated.

The re-specified model showed a good fit, X^2/gl **= 3.322, CFI = .920, NFI = .890, RMSEA = .064, 90% CI [.056, . 067],** P **(rmsea <= .05) < .001.**

A **Confirmatory Factorial Analysis** was conducted in sample B with the objective of validating the presented model. Likewise, no outliers or major deviations from normality were identified and Maximum Likelihood was used as the estimator. The results show a good fit of the model, X^2/gl **= 3.204, CFI = .922, RMSEA = .061, 90% CI [.056, .067],** P **(rmsea <= .05) < .001.**

In order to test the invariance of the previously proposed model between Sample A and Sample B, a Multiple Group Analysis was conducted. In this way, a first analysis was conducted with all the free parameters. The results showed a good fit of the model, X^2 **= (15,** N **= 1157) = 1292.109,** p **< .001, CFI = .921, RMSEA = .044,** P**(rmsea≤.05) = 1.000.** However, the chi-squared test revealed that the measurement model was not invariant between the samples, X^2**(22) = 37.743,** p **= .020**. Based on the analysis, the fixed factor weights of items 1, 19 and 11 were released, it was verified that the fixed correlation model is invariant between both samples, X^2 **(29) = 22.981,** p **= .777.**

Conclusions

The confirmatory factorial analysis revealed that the indicators of the latent variable Motivation Extrinsic by Regulated Identification do not adequately explain the respective variable presenting the lowest Cronbach's alpha, and such evidence is verified in the literature (Leal et al., 2013) , Rodrigues & Joly, 2011, Souza & Miranda, 2017). In turn, evaluating the adjustment indicators of other similar studies (Davoglio, Santos, & Lettnin, 2016; Núñez, Juan, Albo, Izquierdo, & Gregorio, 2005; Smith, Davy, & Rosenberg, 2010; Viana, 2012), it is verified that the present study presents an identical adjustment to the others.

It is concluded, therefore, that the proposed scale model is a robust instrument for the evaluation of academic motivation, taking into account the Self-Determination Theory, although the Extrinsic Motivation by Identified Regulation dimension has not been evaluated given that the respective indicators do not explain in any way the factor. As a proposal for future research it is suggested to construct new indicators that adequately explain the stated factor.

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