Validation Study in the Educational Context of the Portuguese Version of the Multidimensional Work Motivation Scale[1]

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Abstract: The self-determination theory proposes a multidimensional concept of motivation and distinguishes how different types of motivation can be promoted or discouraged. For the application of the theory of self-determination to the educational context, this study aimed to adapt and validate the Multidimensional Work Motivation Scale (MWMS) in the educational context. The scale was answered by 419 teachers from 30 schools from the North and Center of Portugal. Factor analysis indicated that the 19-item scale has the same factor structure as that obtained in the original study. In this study, it was possible to identify that the items that constitute the MWMS are good indicators of constructs to be measured in an educational context and the factors are properly individualized. The scale showed five robust dimensions that permit a broad understanding of motivation, similar to the studies of the original scale. The dimension with the best internal consistency is *demotivation,* while *introjected regulation* obtained the lowest coefficient.

Keywords: self-determination, motivation, questionnaire, teachers

Estudo de Validação em Contexto Educativo da Versão Portuguesa da Escala Multidimensional de Motivação no Trabalho

Resumo: A teoria da autodeterminação propõe uma conceptualização multidimensional da motivação e distingue como os diferentes tipos de motivação podem ser promovidos ou desencorajados. Para a sua aplicação ao contexto educativo, o presente estudo teve como objetivo a adaptação e validação da Escala Multidimensional de Motivação no Trabalho (MWMS). A escala foi respondidapor 468 professores em 30 agrupamentos de escolas do norte e centro de Portugal. A análise fatorial indicou uma escala de 19 itens com estrutura de fatores semelhante à obtida nos estudos originais. Neste estudo foi possível constatar que os itens que constituem o MWMS são bons indicadores dos construtos que se pretendem medir em contexto educativo e que os fatores se encontram devidamente individualizados. A escala demonstrou cinco dimensões robustas que admitem um entendimento lato da motivação, comuns aos estudos da escala original. A dimensão com melhor consistência interna é a *desmotivação* e a *regulação introjetada* é a mais baixa.

Palavras-chave: autodeterminação, motivação, questionário, professores

Estudio de Validación en Contexto Educativo de la Versión Portuguesa de la Escala Multidimensional de Motivación en el Trabajo

Resumen: La teoría de la autodeterminación propone una conceptualización multidimensional de la motivación y distingue como los diferentes tipos de motivación pueden ser promovidos o desalentados. Para su aplicación en el contexto educativo, la presente investigación tuvo como objetivo la adaptación e validación de la Escala Multidimensional de Motivación en el Trabajo (MWMS). La escala fue aplicada a 468 profesores en 30 Escuelas del Norte y Centro de Portugal. El análisis factorial indicó una escala de 19 ítems con una estructura de factores semejante a la obtenida en los estudios originales. En esta investigación fue posible constatar que los ítems que constituyen el MWMS son buenos indicadores de los constructos que se pretenden medir en contexto educativo y que los factores se encuentran debidamente individualizados. La escala demostró cinco dimensiones robustas que admiten una comprensión amplia de la motivación, comunes a los estudios de la escala original. La dimensión con mejor consistencia interna es la *desmotivación*, mientras que la *regulación introyectada* es la más baja.

Palabras clave: autodeterminación, motivación, cuestionario, profesores

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At times of globalization, the contemporary organizational behavior theories need a cross-cultural application (Steers, Monday, & Shapiro, 2004). Hence, the most recent motivation theories focus on this same cross-cultural validation (Steers, Monday, & Shapiro, 2004) and on the application to various

domains of life. The self-determination theory - SDT (Deci & Ryan, 1985) stands out, presenting a multidimensional concept of motivation, permitting the evaluation of the quality of motivation. Therefore, following the adaptation and validation of the Multidimensional Work Motivation Scale (MWMS) to the Portuguese population (Gagné et al., 2015), the main objective of this research is the psychometric adaptation and validation of the scale specifically to the educational context, and the exploration of the psychometric properties of the Motivation Scale.

The Self-Determination Theory

The SDT that in the present study is applies to work in an educational context proposes a multidimensional view on motivation and distinguishes how different types of motivation can be promoted or discouraged, in a continuum of behaviors, ranging from the absence of motivation to externally regulated motivational behaviors that can be progressively internalized, leading to intrinsic motivation. For the SDT, three main categories of motivation are distinguished: demotivation, intrinsic motivation and extrinsic motivation.

First, the concept of demotivation (Deci & Ryan, 2011a, 2011b, 2012; Ryan & Deci, 2011) is defined as the absence of motivation for an activity. Second, intrinsic motivation is defined as the ability to do an autonomous activity, that is, because it is interesting and enjoyable. Third, extrinsic motivation refers to the commitment to activities for instrumental reasons, such as receiving rewards, approving, avoiding punishment and/or disapproval, increasing self-esteem, or reaching a personally valued goal. Taking into account this diversity of instrumental reasons, SDT also specifies different subtypes of extrinsic motivation, which vary in the way they are internalized.

According to the theory, the process of internalization refers to the action oriented by a value of a particular goal or activity that was initially regulated by external factors such as rewards or punishments, so that it becomes internally regulated (Deci & Ryan, 2011a, 2011b, 2012; Ryan & Deci, 2011). A first form of extrinsic motivation that is not fully internalized is the external regulation, which refers to the performance of an activity to obtain rewards or punishments administered by others. On the other hand, introjected regulation refers to the regulation of behavior through the internal pressure of forces such as ego involvement, shame and guilt. This form of internalization is experienced as internal control (Deci & Ryan, 2011b). Finally, the identified regulation refers to the performance of an activity, because it identifies with its value or meaning assumed, so that this form of internalization is volatile.

The identification differs from the intrinsic motivation in the activities in which it is not realized by internal satisfaction, but by the instrumental value it represents. In contrast, internally controlled motivation and demotivation have been the explanation for most desirable results at the behavioral, attitudinal and affective levels (Deci & Ryan, 2011a, 2011b, 2012; Ryan & Deci, 2011). Depending on the research question, however, it is sometimes preferable to use the first order of factors - demotivation, external, introjected, identified and intrinsic motivation – since these motivational subtypes have different attitude results in certain domains, such as motivation for the preservation of the environment (Pelletier, Tuson, Green-Demers, Noels, & Beaton, 1998) and politics (Koestner, Losier, Vallerand, & Carducci, 1996). Therefore, it becomes necessary to develop a scale for each of the different forms of motivation.

The Multidimensional Work Motivation Scale - MWMS

There are scales that are based on SDT in various domains of life, such as the academic (Vallerand et al., 1992) or sports domain (Pelletier, Rocchi, Vallerand, Deci, & Ryan, 2013). Regarding the field of work, Blais, Brière, Lachance, Riddle and Vallerand (1993) published the first scale of motivation based on SDT, in French, despite problems with the internal validity and with the scale of extrinsic regulation (Cronbach's alpha coefficients of only 0.50) which encouraged Tremblay, Blanchard, Villeneuve, Taylor and Pelletier (2009) as well as Gagné et al. (2015) to develop the scale (in French and English). These scales, however, had some problems, such as following the tradition of asking people why they did an activity, which in the workplace could be problematic and led to the development and validation of the MWMS. This is a scale that considers the motivation for work in its field of analysis (Vallerand, 1997) and, for this reason, it was selected to develop its adaptation and validation to the educational context, differing from other measures of motivation for work-oriented tasks (Fernet, Senécal, Guay, Marsh, & Dowson, 2008). MWMS attempts to develop and distinguish itself from previous scales in four different ways.

First, most motivational measures based on SDT follow the tradition of questioning the person through statements that reflect different types of behavioral regulation (Deci & Ryan, 2011b). Examples include statements such as: "Why do you do this work?" (Blais et al., 1993), which are appropriate to the field of sport but can be problematic in the field of work. As employment is defined as a service contract between employee and employer and in exchange for money, the MWMS items reflect this contingency between the workers and the payment they receive more strongly and clearly, and that appears in items such as "Why do you or would you strive in your current job/employment" in order to be able to identify the (current and latent) reasons for the actual work performance.

A second improvement of the MWMS compared to the previous scales refers to the inclusion of the "external regulation" and "introjected regulation" scales, which were created to balance the reasons for the approach and avoidance of work and to avoid confusion between the concepts of "external regulation" and "introjected regulation" (Assor, Vansteenkiste, & Kaplan, 2009). In earlier scales, the items of external regulation were more oriented toward

pursuing rewards and prizes, while the items of "introjected regulation" were more oriented toward avoidance of guilt and shame. Additionally, the MWMS included items that focused on material retributions such as money, as well as social constraints such as being proud that they are important in the work context (Stajkovic & Luthans, 1997).

Thirdly, in the MWMS, it should have caution for the writing of the items to differ from related concepts such as the satisfaction of the needs of autonomy, competence, intrinsic and extrinsic values and a harmonious or obsessive passion for work (Grouzet et al., 2005; Noels, Pelletier, Clément & Vallerand (2003); Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010; Vansteenkiste et al., 2007). For example, the items referring to "demotivation" refer to low satisfaction of the need for competence, for example: "I ask myself, I am not able to perform the most important tasks of this work" (Tremblay et al., 2009), and identification items with the intrinsic value of the affiliation "because, in my opinion, it is one of the best ways to meet people" (Pelletier et al., 2013). Finally, to achieve cross-cultural equivalence, the items were written so as to be interpretable in the various cultures in which the scale was validated.

Next, we will focus on the main objective of this investigation, which consists in the adaptation and psychometric validation of MWMS to the teacher population, and in the exploration of its psychometric properties.

Method

Participants

The sample is made up of 468 teachers from 30 different School groups, offering school levels ranging from pre-school to high school. Of these participants, 374 (79.9%) are female and the rest male.

Regarding the age, 62 (13.2%) participants are up to 40 years of age, 214 (45.7%) are between 40 and 50 years old and 192 (41.0%) are between 50 and 60 years old. In terms of years of experience, the majority, 204 (43.6%) have more than 25 years of professional experience. Regarding academic qualifications, most participants, 411 (87.8%), are licensed.

Instrument

The Multidimensional Work Motivation Scale (MWMS) consists of 19 items and is intended to evaluate the motivation for work. In the adaptation to the educational context, the word work is used, meaning the employment situations in the context of Schools or School groups in which the employer is the State.

The MWMS encompasses five dimensions: (1) Demotivation, which consists in the absence of motivation for an activity; (2) Extrinsic regulation, which refers to commitment to activities for instrumental reasons, such as receiving rewards, approval, avoiding punishment and/or disapproval, increasing self-esteem, or reaching a personally valued goal. External regulation refers to the performance of an activity to obtain rewards or punishments administered by others. This dimension includes two types of regulation: the social and material extrinsic regulation; (3) Identified regulation, which refers to the performance of an activity because it identifies with its value or meaning, so that this form of internalization is volatile; (4) Introjected regulation refers to the regulation of behavior through the internal pressure of forces such as ego-involvement, shame and guilt. This form of internalization is experienced as internal control (Deci & Ryan, 2011b); (5) Intrinsic Motivation, which consists in the ability to do an autonomous activity, that is, because it is interesting and enjoyable.

The items in each dimension are evaluated on a seven-point Likert scale, where 1 = nothing, 2 = very little, 3 = a little, 4 = moderately, 5 = strongly, 6 = very strongly and 7 = completely. In Table 1, the Cronbach's alpha coefficients of the MWMS are displayed as obtained in other languages and in this study.

Table 1

Cronbach's alpha coefficients of MWMS in other languages and in this study

	English	French	Norwegian	German	Chinese	Present Study
Demotivation	0.79	0.81	0.95	0.78	0.87	0.93
Extrinsic Regulation	0.76	0.74	0.84	0.80	0.77	0.90
Introjected Regulation	0.70	0.74	0.79	0.55	0.88	0.77
Identified Regulation	0.75	0.78	0.88	0.65	0.88	0.89
Intrinsic Motivation	0.90	0.88	0.94	0.93	0.89	0.89

Procedure

Data collection. The MWMW was adapted to the educational context (Gagné et al., 2015) in Portugal. In order to adapt the items of the scale to the population of our study, the Portuguese version of the instrument was sent to five judges (three teachers and two psychologists who were knowledgeable on the educational context) to develop the semantic adequacy, certifying the global adequacy of all items to the Portuguese context, so that the adaptation process of the instrument to the semantic adequacy level was considered concluded in accordance with Brislin (1986).

A pre-test was also carried out with 25 teachers to analyze whether the instrument was clearly written and permitted the correct completion.

After the adaptation process, face-to-face contact was made with the Directors of 30 School groups and Secondary Schools, who received explanations on the objectives of the present study and were asked to participate in this study. Additionally, the Director placed a link to complete the questionnaire in the online portal of each school and group. The teachers also received by email the link to the questionnaire and they were asked, in addition to participating in the study, to disseminate it among their fellow teachers under the same conditions. Data were collected between September and December 2015 and 468 valid questionnaires were collected.

Data analysis. The collected data were inserted in a base to analyze: (1) the underlying factor structure and the homogeneity of the items within each of the scales, using exploratory factorial analysis (Principal Axis Factoring); (2) to verify reliability through the internal consistency indicator (Cronbach's alpha); (3) and to verify the psychometric quality of the evaluation model through confirmatory factor analysis (maximum likelihood method). The Statistical Package for the Social Sciences® (SPSS, version 22.0) and Analysis of Moment Structures® (SPSS AMOS, version 19.0) were used to perform the statistical analyses and build the databases.

Ethical Considerations

The principle of participation in this study is based on a free and informed decision about the nature, implications and risks of this participation. The participants received information for the purpose of free and informed consent. This information was provided before they had access to the questionnaire and also at the beginning of the questionnaire itself.

Results

Exploratory Factor Analysis (EFA)

The analysis of the correlation matrix showed significant correlations ($p < 0.001$ and $p < 0.05$) with coefficients between $r = -0.27$ and $r = 0.85$. No overly or perfectly correlated items were observed. Thus, there are no problems at the level of multicollinearity and singularity, respectively (Field, 2013).

Prior to EFA, criteria were established for the retention of items in each of the following scales: (1) saturation ≥ 0.40 of each item in the hypothetical factor and in only one factor; (2) consistency between the factorial solution and the items in each factor; and (3) each factor is represented by at least 3 items (Field, 2013; Osborne & Fitzpatrick, 2012). These criteria were applied and did not lead to the removal of any items.

We verified the factorability of the data matrix, as the KMO value is higher than 0.60 (KMO = 0.85) and the Bartlett sphericity test is significant ($p < .001$). The analysis of commonalities revealed values between 0.42 and 0.97, presenting an average of 0.72, thus reflecting that 72% of the variance associated with the items is common or shared.

EFA was used, by means of the Principal Axis Factoring method with orthogonal rotation (varimax procedure). An analysis of the inflection points in the scree plot and a verification of the eigenvalues were carried out, which led to the extraction of five factors. The scree plot indicated that no more than five factors should be extracted and this solution met the Kaiser normalization criterion (eigenvalue ≥ 1). The five-factor solution extracted explains 71.90% of the total variance. The order of factors is as follows: extrinsic regulation, demotivation, intrinsic motivation, identified regulation and introjected regulation.

The analysis of Table 2 shows that four items present factor loadings < 0.70, but these are considered reasonable (> 0.45). The remaining items have a factor loading > 0.70, which is considered excellent (Field, 2013).

Regardless of the order of factors, in the remaining tables, the information will be presented following the order of dimensions related to the continuum referred in the SDT, that is, starting with the demotivation and ending with the intrinsic motivation. Observing Table 3, it can be verified that the intrinsic motivation correlates negatively with the demotivation ($r = -0.098$) and positively with the introjected ($r = 0.177$) and identified regulation ($r = 0.634$).

Table 2
Factorial structure and commonalities of MWMS

	Factors					h²
	1	2	3	4	5	
I do not struggle because I actually feel that my work is a waste of time.		0.836				0.775
I do little because I think this work is not worth the effort.		0.953				0.973
I do not know why I'm at this work, since it's a pointless job.		0.836				0.753
To get approval from others (for example, my superiors, my colleagues, my family, clients ...).	0.820					0.815

continuation...

	Factors					h²
	1	2	3	4	5	
Because other people will respect me more (for example, my superiors, my colleagues, my family, parents, students ...).	0.771					0.778
To avoid being criticized by other people (for example, my superiors, my colleagues, my family, parents, students ...).	0.721					0.747
Because only if I work hard enough in my job I will get financial rewards (for example, leadership ...).	0.730					0.647
Because only if I try hard enough in my job, they can offer me more job stability (for example, leadership ...).	0.892					0.931
Because I risk losing my job if I do not try hard enough.	0.680					0.568
Because I need to prove to myself that I can.					0.490	0.422
Because it makes me feel proud of myself.					0.477	0.502
Because otherwise I'll feel ashamed of myself.					0.759	0.621
Because otherwise I feel bad about myself.					0.766	0.649
Because I personally consider it important to strive in this work.				0.715		0.707
Because striving in this work is in line with my personal values.				0.806		0.817
Because striving in this work has a personal meaning for me.				0.712		0.682
Because doing my job is fun.			0.678			0.586
Because what I do in my job is stimulating.			0.926			0.919
Because the work I do is interesting.			0.807			0.769
Variance percentage	23.74	13.52	12.84	11.79	10.02	

Table 3
Pearson's correlations among the dimensions

	1	2	3	4	5
1. Demotivation					
2. Extrinsic Regulation	0.455**				
3. Introjected Regulation	0.118*	0.381**			
4. Identified Regulation	-0.161**	-0.065	0.402**		
5. Intrinsic Motivation	-0.098*	-0.084	0.177**	0.634**	

*$p < .05$; **$p < .01$

Reliability

Internal consistency was calculated using Cronbach's alpha coefficient. Analyzing Table 4, it can be verified that the reliability of the MWMS varies between acceptable and high (Marôco, 2011). The dimension with the best internal consistency is demotivation, while introjected regulation has the lowest.

Table 4
Cronbach's alpha coefficients

	n	Mean	S.D.	α	95% Confidence Interval
Demotivation	468	1.79	1.43	0.93	0.92; 0.94
Extrinsic Regulation	468	2.37	1.30	0.90	0.88; 0.91
Introjected Regulation	468	4.75	1.42	0.77	0.74, 0.81
Identified Regulation	468	6.14	0.96	0.89	0.87; 0.90
Intrinsic Motivation	468	5.26	1.15	0.89	0.87; 0.91

Confirmatory Factor Analysis

After EFA, a confirmatory factorial analysis was performed to test the model provided by the authors of the original version (Gagné et al., 2015). This model consists of six factors, plus a second order that encompasses social and material extrinsic regulation.

As no adjustment measure provides a conclusive answer to the adjustment of a model, in this study, a range of adjustment indices was used to test the MWMS structure. In order to verify the adjustment of the model, were used the recommendations of several authors (Brown, 2015, Byrne, 2013, Hair, Hult, Ringle, & Sarstedt, 2013, Marcoulides & Schumacker, 2013).

Absolute indices do not use an alternative model as a basis for comparison, they derive from the adjustment obtained through covariation matrices and ML minimization function. The values of $\chi^2 < 3$ and $p > 0.05$, SRMR < 0.07 and RMR close to 0 are considered good. GFI and AGFI values ≥ 0.95 are considered very good. In this sense, it can be verified through Table 5 that, at the level of absolute indices, the model shows a good to very good adjustment.

Regarding the relative indices, these compare the model tested, an independent model and a saturated model. In the independent model, it is specified that all measured variables are not correlated. The coefficients of NFI, CFI and TLI ≥ 0.95 are considered very good, and the value of RFI is closer to 1 (Brown et al., 2013, Marcoulides & Schumacker, 2013). Therefore, as shown in Table 5, at the level of relative indices, the model tested presents a very good adjustment.

The indices of population discrepancy compare the adjustment of the obtained model, the means, the variances of the sample and those that would be obtained from the population. The RMSEA is a function of discrepancy between an estimated matrix and the population matrix, while at the same time accounting for the complexity of the model. PCLOSE is a significance test of RMSEA to verify that the estimated matrix and population matrix are the same. In this sense, RMSEA ≤ 0.05 (very good) and PCLOSE > 0.05 (Brown, 2015; Byrne, 2013; Hair et al., 2013; Marcoulides & Schumacker, 2013) are sought. Hence, it can be affirmed that the adjustment of the model tested is very good. In addition, it can be affirmed that the population matrix and the estimated matrix are the same, and that the mean error in the model is minimal (Table 5).

Table 5
Adjustment measures of structural model: Maximum likelihood

Adjustment statistics	Model
Absolute Indices	
χ^2/df (p-value)	1.349 (.131)
Standardized Root Mean Square Residual (SRMR)	0.021
Root Mean Square Residual (RMR)	0.035
Goodness-of-fit Index (GFI)	0.987
Adjusted Goodness of Fit Index (AGFI)	0.972
Relative Indices	
Normal Fit Index (NFI)	0.989
Comparative Fit Index (CFI)	0.997
Relative Fit Index (RFI)	0.982
Tucker-Lewis Index (TLI)	0.995
Population Discrepancy Indices	
Root Mean Square Error of Approximation (RMSEA)	0.027
RMSEA 90% confidence interval (LO - HI)	0 - .05
PCLOSE	0.942

Discussion

This research focused on the adaptation and validation of MWMS, an instrument based on the multidimensional concept of motivation inserted in the self-determination theory. This scale had been previously tested in nine different countries and in seven different languages by their authors (Gagné et al., 2015), and showed acceptable behavior.

In this study in an educational context, it could be verified that the items that make up the MWMS are good indicators of the constructs under analysis and that the factors are adequately individualized, similar to what happens in other studies of the scale in 9 countries. The scale demonstrated five robust dimensions that support a broad understanding of motivation. These factors were also observed in studies of the original scale (Gagné et al., 2015).

Concerning the reliability of the instrument, it could be verified that the internal consistency varies between acceptable and high and that only one dimension, of introjected regulation, presents acceptable levels, while the remainder presents high levels of internal consistency. The values found in this study resemble those of the other versions of the scale construction study (Gagné et al., 2015), except for the German version.

With regard to the factor structure of the MWMS, the model indicated by the authors of the original version (Gagné et al., 2015) could be confirmed. The scale showed a structure that includes seven distinct factors, with one second-order factor, which encompasses the social and material extrinsic regulation. In general, the scale adapted and validated to the educational context presented good adjustment indices, similar to the study of the original version (Gagné et al., 2015). Compared with the original version, we also

observed in this study how intrinsic motivation correlates negatively with extrinsic regulation and amotivation. In sum, the MWMS in the Portuguese version is considered equivalent to the existing versions in other languages and proves to be a robust and reliable instrument to measure, in a multidimensional way, the motivation according to the theory of self-determination.

At the level of practical implications, the application of this measuring instrument in the educational context would provide relevant information on the motivational state of the teachers. This information would be relevant for the implementation of measures and practices that are intrinsic to motivation, or something close such as introjected regulation. That in turn could contribute to an improvement of both the teaching and mental health of teachers.

As limitations and similar to other MWMS applications in other languages, no integrated regulation subscale is included, which is a form of extrinsic motivation that is more internalized than the identified regulation. Previously published scales containing an integration of the subscale show that the identified regulation subscale cannot be statistically separated from intrinsic motivation (Mallett, Kawabata, Newcombe, Otero-Forero, & Jackson, 2007; Tremblay et al., 2009; Vallerand et al., 1992).

Additionally, the items that measure the motivation integrated in other scales are questionable in terms of their face value, for example, in items that measure the passion for an activity, for example: "because it has become a fundamental part of who I am" (Tremblay et al., 2009). The enthousiasm for work measures explicitly and simultaneously the integration of people's social identity into the activity and their motivation for it (Vallerand et al., 2003), and thus differs from "mere" motivation.

Finally, the MWMS applied to the educational context offers the opportunity to examine, in educational contexts, the distinction between antecedents and consequences of social or material external regulation. We may consider that, with teachers and similar to the results presented in previous research (Ryan & Deci, 2011), tangible rewards have weak effects on motivation and pride in the accomplishment of the tasks inherent in teaching, while acknowledgement and social rewards can have a more positive impact.

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