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Teacher's motivation for teaching: questionnaire validity evidence

Motivação do professor para o ensino: evidências de validade de instrumento de avaliação

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Abstract

Objective

The teacher's motivation is associated with his/her achievements, health and well-being, which reflect on the quality of teaching. Based on the Theory of Self-Determination, validity evidence of an instrument to assess teacher's motivation for teaching was developed, containing 26 items to be answered on a Likert-type scale.

Method

The questionnaire Teacher's motivation for teaching was applied online in a sample of 509 higher education teachers, 50.39% female and 49.41% male, with ages ranging from 25 to 73 years. Data were analyzed using Exploratory Factor Analysis, using the Parallel Analysis method.

Results

Exploratory Factor Analysis revealed a two factors structure with a few structural problems that required the deletion of some items. The 17-item version of the teacher's motivation for teaching was simple and the estimated adjustment indexes were very good.

Conclusion

The high factor loadings obtained among the items and the two factors to which they clustered allow to consider them representatives of the constructs Autonomous and Controlled Motivation.

Keywords: Factorial analysis; Motivation; Psychological tests; Teachers.

Resumo

Objetivo

A motivação do professor está associada às suas conquistas, saúde e bem-estar, que refletem na qualidade do ensino. Com base na Teoria da Autodeterminação, buscou-se evidência de validade de um instrumento para avaliar a motivação do professor para ensinar, contendo 26 itens a serem respondidos em uma escala do tipo Likert.

Método

O questionário Motivação do professor para o ensino foi aplicado online em uma amostra de 509 professores do ensino superior, 50,39% do sexo feminino e 49,41% do sexo masculino, com idades compreendidas entre os 25 e os 73 anos. Os dados foram analisados por meio da Análise Fatorial Exploratória, utilizando-se o método de Análise Paralela.

Resultados

A Análise Fatorial Exploratória revelou uma estrutura de dois fatores com alguns problemas estruturais que exigiram a exclusão de alguns itens. A versão de 17 itens da motivação do professor para ensinar foi simples e os índices de ajuste estimados foram muito bons.

Conclusão

As altas cargas fatoriais obtidas entre os itens e os dois fatores aos quais eles se agrupam permitem considerá-los representantes dos construtos Motivação Autônoma e Controlada.

Palavras-chave: *Análise fatorial; Motivação; Testes psicológicos; Professores.*

Motivation in the educational framework is a topic of academic and scientific interest that is marked by a considerable increase in the number of published studies in recent years (Patall, 2021, Ryan & Deci, 2021). Although the teachers' motivation for their work is of outstanding importance (Ahn et al., 2021; Orsini et al., 2020; Ryan & Deci, 2016), the investigation have focused mainly on student motivation. Despite this mismatch, there is evidence that teachers' motivation has important consequences for them, which include a sense of accomplishment, health and well-being, besides providing commitment and diligence in their teaching practices. Additionally, motivated teachers tend to support their students' motivation, nurturing their basic psychological needs for autonomy, competence, and belonging (Abós et al., 2018; Han & Yin, 2016).

Han and Yin (2016), supported by other authors, conceptualized the teacher's motivation as the reasons that drive the decision for an activity, the intensity of the effort spent and the persistence in the teaching activity, under the influence of contextual factors. In this connection, Abós et al. (2018) add that the teachers' motivation is clearly revealed in their teaching behaviors. Just like what has been observed in studies on motivation in other human areas – such as school learning, sports, health and organizations, investigators on teachers' motivation have adopted established theories as a reference, with a prevalence of social-cognitive theories, exploring constructs such as self-efficacy beliefs, teachers' satisfaction for teaching and autonomous motivation (Ahn et al., 2021; Gorozidis & Papaioannou, 2014; Han & Yin, 2016; Li et al., 2015; Ryan & Deci, 2019; Stupnisky et al., 2018).

This article reports the survey of validity evidence of an instrument to measure teacher motivation, the Teacher Motivation for Teaching (TMT) questionnaire, using the Self-Determination Theory (SDT) as a reference. It is a broad approach to motivation that focuses on the development and well-being of people, being the basis for studies in different contexts, including educational ones. Proposed by Ryan and Deci (2017, 2019) and Ryan et al. (2021), the SDT assumes that human beings are active, lively and curious organism, with tendencies towards growth, healthy psychological development and self-regulation. For this reason, humans engage in activities that interest them, further developing their personal and interpersonal coherent attitudes.

Based on the multidimensional view that intensity and quality should be distinguished in motivation, SDT postulates the existence of two qualitatively differentiated types of motivation. On the one hand, we have the controlled motivation, composed of forms of extrinsic motivation caused by external and introjected regulation, which are types of less internalization of external demands and values. On the other hand, people can act by autonomous motivation, which includes extrinsic motivation caused by integrated and identified regulation, in which external values and expectations are internalized and integrated (Ryan & Deci, 2017, 2019; Ryan et al., 2021). Due to its limited effects on engagement and persistence, controlled motivation, compared to autonomous motivation, is considered weaker and more fragile. The SDT is the only theory that, in addition

to these motivational forms, includes the condition of total lack of regulation and internalization, which is demotivation.

The internalization of external demands and expectations, according to the SDT, will occur with environmental influences that foster the satisfaction of three basic psychological needs – autonomy, competence and belonging. Hence, frameworks that allow a certain degree of occupational autonomy that increases self-perceptions of competence and of being well connected with people should contribute to the development of autonomous motivation.

Ryan and Deci (2017) pointed out that hundreds of studies, developed in the last four decades, have provided support to SDT, repeatedly proving its practical value. Specifically in relation to teachers' motivation, as a sample, among the results of the study by Ahn et al. (2021), positive relationships were revealed among the measures of teachers' autonomous motivation and those of students, and this relationship was evidenced by the perception that students had about their teachers adopting practices to support their psychological need for autonomy and competence.

Measures for the assessment of teachers' motivation for teaching

Early studies on teacher motivation for teaching, based on the SDT, used general measures related with work, such as the Work Motivation Inventory (Blais et al., 1993) or the Work Extrinsic and Intrinsic Motivation Scale (Tremblay et al., 2009). For Abós et al. (2018), the results of these assessments were limited because the instrument items would report to broad contexts or, otherwise, would not portray the specific teaching setting.

Roth et al. (2007) developed the Autonomous Motivation for Teaching (AMT) scale, based on the *continuum* of self-determination, excluding extrinsic motivation by integrated regulation. In the study, the quality of motivation to perform specific teaching tasks of 1,321 Israeli teachers was assessed, relating it to measures of personal fulfillment and emotional exhaustion. The items internal consistency results (Cronbach's alpha) ranged from 0.68 to 0.76 and the Smallest Space Analysis revealed adequate indices of factor discrimination by the participants. In 2015, Li and collaborators used the same AMT scale to assess the motivation of 767 teachers in Mainland, China. The results of the internal consistency and model fit analyses were also considered adequate (Li et al., 2015).

Taylor and Ntoumanis (2007) related the motivational quality of a group of UK teachers with the self-determination of their students in physical education classes. One of the measures used in the study was an adapted version of the Situational Motivation Scale (Guay et al., 2000), originally designed to assess intrinsic motivation and extrinsic motivation by identified and external regulation as well as demotivation. The 16 items of the scale were adapted to the context of physical education classes for children and adolescents, with an additional four items of extrinsic motivation assessment by introjected regulation. The internal consistency indexes of the items in the subscales, measured by Cronbach's alpha, ranged from 0.70 to 0.93. The instrument was one of the measures used in Ahn's et al. (2021) survey with 35 elementary school teachers from Seoul, South Korea. Following the procedure used by Abós et al. (2018), Ratelle et al. (2007) and Stroet et al. (2015) the items of intrinsic motivation and extrinsic motivation by identified regulation indicated positive correlations. They were further combined to assess autonomous motivation; in the same way, the combination of extrinsic motivation assessment items by external and introjected regulation was considered controlled motivation. Internal consistency indices ranged from 0.79 to 0.88.

A group of Canadian investigators (Fernet et al., 2008) developed and validated the WorkTasks Motivation Scale for Teachers (WTMST), designed to assess five motivational constructs

– intrinsic motivation, extrinsic motivation by identified regulation, introjected regulation, external regulation and demotivation, in relation to six work tasks, present in the teacher’s daily routine: class preparation, teaching, assessment, class management, administrative tasks and complementary tasks. The results of the study with 609 teachers indicated evidence of validity for the evaluation of the predicted constructs, and the instrument was considered suitable for use in investigations on the teachers’ work motivation processes.

The WTMST scale was translated and adapted by Rudnik (2012) for use in research – *Questionário de Avaliação da Qualidade Motivacional do Professor para Determinadas Tarefas* (Teacher Motivational Quality Assessment Questionnaire for Certain Tasks). Using a sample of 500 teachers, they found evidence of validity from the results of the Principal Components Extraction, which revealed 5 factors, to which the items associated with demotivation, extrinsic motivation by external regulation, extrinsic motivation by introjected regulation, extrinsic motivation by identified regulation and intrinsic motivation were clustered. The items’ internal consistency indexes (Cronbach’s alpha) were also considered adequate. The Brazilian version was also used in the survey of Colares et al. (2019) who evaluated the motivational quality of post-graduation professors in accounting sciences from different regions of Brazil.

A version of the WTMST for the Spanish language was implemented by Ruiz (2015), with a sample of 172 teachers. Karbasi and Ghanizadeh (2017) adapted the WTMST to the Persian language in a study with 127 Iranian teachers, involving other educational variables, and the adjustment indices were considered adequate. English teachers from Iran (142) participated in a study, conducted by Ghanizadeh and Royaei (2018), which assessed motivation for teaching through the WTMST, as well as Pinkas (2020) who also used the WTMST, to assess motivation quality of 467 secondary school teachers in Tuzla (Bosnia and Herzegovina). Neves and Coimbra (2018) adapted and validated the scale for the Portuguese language, finding evidence that supported the five-dimensional model of motivation, by Main Components Extraction, and acceptable indices of internal consistency of each subscale items (Cronbach’s alpha), as well as adequate model adjustment, which was verified through confirmatory factor analysis.

Kim and Cho (2014) evaluated the motivational quality and sense of effectiveness of 533 children’s beginner teachers. As a measure, the WTMST was adapted to the investigation context, with three items for each subscale, all answered on a 7-point Likert-type scale. The results of internal consistency of the subscales by Cronbach’s alpha, as well as the fit of the model (Confirmatory Factor Analysis) were considered satisfactory. Ali (2016) also evaluated evidence of validity of the same adapted version of the scale, with junior teachers from Saudi Arabia, reporting satisfactory indices obtained by Confirmatory Factor Analysis and Cronbach’s alpha.

Soenens et al. (2012) adapted the Self-Regulation Questionnaire-Academic (Ryan & Connell, 1989) to the context of teaching motivation. The instrument contained 16 items, covering the four types of motivation provided for in the self-determination *continuum* (Ryan & Deci, 2017, 2019), by external regulation, introjected, identified and intrinsic motivation, obtaining evidence of validity with the relevant samples of teachers.

It can be observed with the description of the instruments developed for the evaluation of the teacher motivation for teaching, based on the SDT, that the items were elaborated to discriminate the qualitatively differentiated types of motivation, theoretically predicted. Some studies with teachers used adapted versions of scales, originally developed to assess motivation at work, with the AMT (Roth et al., 2007) and WTMST (Fernet et al., 2008) being education context-specific assessment proposals. The WTMST (Fernet et al., 2008) has been the most used

instrument in research; however, observing that the teacher's motivation for five teaching tasks is extensive and repeats the same motivation assessment items for each activity evaluated, making its use in research difficult, according to Abós et al. (2018).

The searches for validity evidence of the instruments available, reported in the literature, were largely conducted with small samples. Furthermore, they were based on the use of internal consistency analysis (Cronbach's alpha) and analysis of principal and confirmatory components extraction, obtaining factor loadings and adjustment indices considered adequate or satisfactory. According to Damásio (2012), Cronbach's alpha has important limitations, although it is widely used, because it assumes that all items have the same importance for the factor and that they present a linear correlation with each other. In addition, it assesses consistency (the degree of interrelationship between variables) and not homogeneity, which refers to the dimensionality of the construct.

Damásio (2012) and Hernandez et al. (2017) argue that Exploratory Factor Analysis (EFA) and Principal Component Analysis (PCA) are different techniques, although commonly used in research to analyze the factor structure of instruments. Both assume that the variance of each variable is composed of specific variance (of the variable itself), common variance (shared by all items in the factor or component), and error variance (portion of the item not explained by the component or factor). The PCA considers the specific and common variance, inflating the factor loadings and communalities. In EFA, the objective is to discover the structure of latent constructs in the set of instrument items, with the explained variance being a portion of common variance, extracted from the data set reviewed. In addition, factor loadings that explain between 30% and 40% of the common variance between the factor items would consider a large part of variance unexplained, advising the retention of items with a loading greater than 0.50. As for the criteria for retention of factors, the classic methods of decision making, such as eigenvalues and screeplot, are considered inadequate; the use of Parallel Analysis is indicated, because it has shown greater precision. In this study, validity evidence of a scale for evaluating teachers' motivation for teaching was sought, prepared with items available in the literature and translated into Portuguese, using statistical techniques recommended by scholars of psychometrics today, such as, for example, Damásio (2012), Hernandez et al. (2017).

Method

Participants

The sample consisted of 509 teachers who worked in higher education; 256 (50.39%) were female and 252 (49.41%) male; aged between 25 and 73 years ($M = 44.44$, $SD = 9.56$); 3.33% were postgraduates *Lato Sensu*, 19.21% held a Masters' degree, 43.72% were doctors (PhD) and 33.52% post-doctors; a total of 329 teachers worked in the public school system; 149 in private institutions and 31 teachers in community institutions. It was a convenience sample and met the requirements of an adequate number of participants per item, in a ratio slightly above 10:1 (Borges et al., 2020).

Instrument

Teachers' Motivation for Teaching (TMT)

The TMT, object of this study, was developed considering the Brazilian context from the adaptation of the items contained in the WTMST (Fernet et al., 2008) and in the Motivation to

Teach scale, developed by Wilkesmann and Schmid (2014). The items of the two scales had already been translated, using the backtranslation procedure, respectively by Rudnick (2012) and Bellusci (2015) who assessed the motivation of 586 teachers using the Motivation to Teach. In both studies, evidence of the validity of each instrument was found, with the search for a factor structure performed through analysis of the principal components (PCA) and the Cronbach's alpha as an internal consistency test.

In the TMT, after the initial question "Why do you work in education?", there are 26 items on a Likert scale, with a minimum score of 26 and a maximum of 130, which correspond to qualitatively differentiated types of motivation (extrinsic by external regulation), introjected, identified and intrinsic motivation) and demotivation such as, for example, statement number 1: "Because my employment contract requires me to continue teaching", an item that assesses extrinsic motivation by external regulation.

Procedures

The research was approved by the Research Ethics Committee, and was registered under number 1,489,560 and CAAE number 54254016.6.0000.5231. The questionnaire items were submitted to a pilot study with 21 teachers with different education levels, who were not included in the final sample. Change of question 12 was indicated *If I don't teach, I'll be in trouble – to – If I don't teach, I'll be harmed*. The evaluation was formatted, including the Free and Informed Consent Term, for online application, through the Google Drive tool, and the survey link was informed by e-mail. The data were transferred to the Factor Analysis software to perform the Exploratory Factor Analysis (EFA), using the Parallel Analysis method, through the Robust Unweighted Least Squares (RULS), with Direct Oblimin rotation (Lorenzo-Seva & Ferrando, 2019).

Results

The distribution of TMT scores using Mardia's multivariate normality test revealed values higher than 1 in absolute value for asymmetry (-2,330 to 5,820) and kurtosis (-1,355 to 37,815). In this case, the use of polychoric correlations is recommended. The items polychoric correlation matrix is presented in Table 1.

Table 1
Polychoric Correlations Matrix of Teacher Motivation Teaching Items

Items	1	2	4	5	6	9	10	12	13	14	15	16	18	19	20	22	24
1	1																
2	-0.3	1															
4	0.48	-0.3	1														
5	0.71	-0.5	0.6	1													
6	0.36	-0.1	0.41	0.46	1												
9	-0.4	0.86	-0.3	-0.5	-0.2	1											
10	0.3	-0.1	0.35	0.29	0.54	0.06	1										
12	0.48	0.36	0.47	0.63	0.57	-0.4	0.5	1									
13	0.26	-0	0.37	0.33	0.6	0.1	0.65	0.62	1								
14	-0.2	0.56	-0.1	-0.2	0	0.61	0.02	-0.1	0.14	1							
15	0.42	-0.3	0.6	0.51	0.45	-0.3	0.41	0.63	0.41	-0	1						
16	-0.3	0.65	-0.1	-0.4	-0.1	0.67	-0.1	-0.2	-0	0.54	-0.1	1					
18	-0.3	0.68	-0.2	-0.4	-0.1	0.73	-0.1	-0.3	-0.1	0.58	-0.2	0.66	1				
19	-0.4	0.766	-0.3	-0.5	0.17	0.83	-0.1	-0.4	-0.1	0.53	-0.3	0.67	0.74	1			
20	-0.2	0.56	-0.2	-0.3	0.08	0.62	0	-0.3	0.01	0.45	-0.2	0.61	0.66	0.76	1		
22	-0.2	0.53	-0.2	-0.4	-0	0.6	-0	-0.2	0.01	0.45	-0.1	0.58	0.59	0.65	0.57	1	
24	-0.2	0.6	-0.1	-0.3	-0	0.61	0.05	-0.2	0.05	0.46	-0.1	0.66	0.71	0.68	0.72	0.72	1

The Kaiser-Meyer-Olkin test yielded a value of 0.87, considered good and the Bartlett Sphericity Test presented values, X^2 5739.2 ($df = 325$; $p = 0.000010$), both indicating the suitability of the data for factor analysis. The EFA revealed a 5-factor solution with eigenvalues > 1.0 . However, Parallel Analysis based on the Minimum Rank Factor Analysis recommended the retention of two factors (Table 2).

Table 2

Parallel Analysis based on Minimum Rank Factor Analysis

Variables	% of variance		
	Current data	Random average	95 th percentile random
1	44.9169*	11.9054	13.2124
2	22.2901*	10.8988	12.0595
3	6.4451	10.1003	11.0772
4	4.1787	9.3154	10.0020
5	3.8365	8.6099	9.2464

Note: *Number of factors recommended when the 95th percentile is considered. Number of 500 random polychoric correlation matrices. Raw data permutation method.

The survey of the factor structure carried out with the most used scales to assess teachers' motivation, the AMT (Roth et al., 2007) and the WTMST (Fernet et al., 2008) revealed a structure of 5 factors to which evaluation items of the types theoretically foreseen in the continuum of self-determination were grouped. However, the analyses used were PCA and / or Cronbach's alpha, in small samples. In the present study, with a sample of 509 teachers and the use of more recent analyses recommended for this purpose, 5 factors emerged with eigenvalues greater than 1; however, the recommendation was to retain only 2, which explained 67.2% of the variance

In the factorial matrix of the EFA for two factors, to Factor 1 the items elaborated for the evaluation of extrinsic motivation by external and introjected regulation were grouped, with factor loadings ranging from 0.51 to 0.74. The items originally designed for the assessment of extrinsic motivation by identified regulation and intrinsic motivation were around Factor 2, with factor loadings ranging from 0.66 to 0.87. Consistent with the theoretical model and following the same procedure used by Abós et al. (2018), Ratelle et al. (2007) and Stroet et al. (2015), the items grouped in the factors were considered as indicators of controlled and autonomous motivation, respectively (Table 3).

Some structural problems were identified, not corresponding to the original model proposed. In Factor 2, in addition to the items of extrinsic motivation by identified and intrinsic regulation, all items designed to assess demotivation with a negative factorial load were also added. In addition, item 3 (*I don't know, sometimes I don't know why I'm still a teacher*), item 11 (*I don't know why, I don't feel good as a teacher*), item 21 (*I have no particular interest in being a teacher*), item 23 (*If I could, I would quit this profession*) and item 25 (*I don't know why I'm still a teacher, because this profession's conditions are unbearable*), loaded on both factors. Finally, item 8 (*For the feeling of accomplishment*) loaded on both factors and item 26 (*Because teaching gives me access to other activities such as research, extension, administration*), both originally designed to assess autonomous motivation, did not obtain enough factor loading. Thus, the nine items were excluded and a new EFA, with the same previous method, was performed with the remaining 17 items.

The Kaiser-Meyer-Olkin test provided a value of 0.86 (considered good) and the Bartlett Sphericity Test presented values, X^2 (136) = 5773.7, $p < 0.00001$, both indicating the suitability of the data for factor analysis. The items polychoric correlation matrix can be seen in Table 4. Three factors with eigenvalues > 1.0 were extracted. Parallel Analysis, based on Minimum Rank Factor

Analysis, maintained the two-factor retention recommendation. According to Table 4, the items of the reduced version of the TMT obtained factor loadings ranging from 0.54 to 0.88; it is worth noting that, for 13 items, the loads were greater than 0.70. The items established in the theoretical model were grouped around the two extracted factors, being F1 Autonomous Motivation and F2 Controlled Motivation. The Bentler's Simplicity Index was 0.99 (100th percentile) and the Loading Simplicity Index was 0.63 (100th percentile). These values reveal that each item predominantly represents a single dimension and the overall solution presented a high degree of simplicity. Considering the limitations of the analysis described above, the extracted Cronbach's alpha was 0.91 for Factor 1 and 0.82 for Factor 2, revealing high interrelationships between the items of each subscale, and 0.71 for the total scale.

Table 3

EFA Factor Loads with Direct Oblimin Rotation of Teacher Motivation Teaching Items and Commonalities

Items	F1	F2	h ²
1 Because my employment contract requires me to continue teaching	0.51		0.40
4 Because I am paid for this	0.63		0.46
5 Because the school forces me to teach	0.59		0.60
6 Because this is my job and I would feel guilty if I didn't teach	0.74		0.51
10 Could let people down if I didn't teach	0.67		0.42
12 If I don't teach, I will be in trouble	0.73		0.61
13 If I didn't, I'd be embarrassed	0.74		0.50
15 Because by teaching I keep my job	0.70		0.52
2 Because I take great pleasure in teaching		0.81	0.69
9 I feel fulfilled when I am teaching		0.86	0.76
14 Because during classes I am in a pleasant state of excitement		0.66	0.41
16 Because I find the task of teaching interesting		0.78	0.60
18 Because it's nice to teach		0.83	0.68
19 Because, when teaching, I feel professionally fulfilled		0.87	0.79
22 Because I see my work as important to my students		0.75	0.53
24 Because I consider personally important the task of teaching		0.84	0.65
3 I don't know, sometimes I don't know why I'm still a teacher	0.312	-0.57	0.53
7 I don't feel good working as a teacher		-0.456	0.34
17 Teaching means little to me because I don't see how teaching can help my students		-0.62	0.52
21 I have no particular interest in being a teacher	0.312	-0.55	0.50
23 If I could, I would quit this profession	0.310	-0.64	0.62
8 For the feeling of accomplishment	0.473	0.47	0.31
26 Because teaching gives me access to other activities such as research, extension, administration	0.258	0.18	0.07

Table 4

Exploratory Factor Analysis Factor Loads with Direct Oblimin Rotation of Teacher Motivation Teaching Items and Commonalities

Items	F1 (0.91)*	F2 (0.81)*	h ²
2 Because I take great pleasure in teaching	0.83		1.00
9 I feel fulfilled when I am teaching	0.86		0.96
14 Because during classes I am in a pleasant state of excitement	0.69		0.66
16 Because I find the task of teaching interesting	0.79		0.77
18 Because it's nice to teach	0.83		0.80
19 Because, when teaching, I feel professionally fulfilled	0.88		0.94
20 Because for me the task of teaching is of personal importance	0.78		0.72
22 Because I see my work as important to my students	0.76		0.77
24 Because I consider personally important the task of teaching	0.86		0.99
1 Because my employment contract requires me to continue teaching		0.54	0.68
4 Because I am paid for this		0.65	0.70
5 Because the school forces me to teach		0.66	0.98
6 Because this is my job and I would feel guilty if I didn't teach		0.73	0.68
10 Could let people down if I didn't teach		0.75	0.72
12 If I don't teach, I will be in trouble		0.80	0.87
13 If I didn't, I'd be embarrassed		0.82	0.96
15 Because by teaching I keep my job		0.72	0.80

Note: * α values.

Discussion

The SDT seeks to understand the reasons for people's involvement in achievement activities, presupposing a continuum of self-regulation of extrinsic motivation, which differs in controlled motivation and autonomous motivation; demotivation, which means the absence of intention to act and intrinsic motivation, the most self-determined type, whose motive for performing is the activity itself. From this perspective, teacher motivation for teaching is an important variable in the learning context, associated with personal well-being and the quality of student motivation.

Research on teacher motivation for teaching uses assessment instruments designed for the general work context but adapted for teaching. The measurements by Roth et al. (2007) and Fernet et al. (2008) include specific items of motivation to perform teaching tasks and also refer to operational definitions of qualitatively differentiated types of motivation, theoretically proposed in the continuum of self-determination.

The elaboration of the TMT, based on the combination of items available in the literature, aimed to provide an instrument of simple application and sensitive to capture the motivational quality of Brazilian teachers. To this end, the present study reports the initial steps for its validation. Using exploratory procedures, evidence of factor validity was generated for the TMT, a 26-item scale, designed to assess demotivation, extrinsic motivation by external regulation, introjected, identified and intrinsic motivation. The EFA revealed 2 factors, a parsimonious solution, in view of the high degree of simplicity obtained. The estimated reliability for the model revealed excellent values for all factors and for the overall scale. The high factor loadings obtained between the items and the two factors to which they were grouped allow us to consider them representatives of the Autonomous Motivation and Controlled Motivation constructs.

The extraction of two factors, however, did not support the presence of demotivation assessment items in the scale, a result that can be theoretically explained by the self-determination continuum, which differentiates the quality of motivation and not its absence. According to the SDT, intrinsic motivation refers to the actual engagement in activities for the interest and satisfaction they cause to their authors. In this connection, extrinsic motivation is not simply a counter position to intrinsic motivation, but a motivation category for which qualitatively differentiated reasons for action are provided, moving from instrumental regulation to the integration of events external to the self (Ryan & Deci, 2019). Demotivation, lack of intention to act, is not part of the continuum of control and autonomy and, in the original version of the TMT, demotivation items were presented as an alternative for the teacher to explain the reasons why he continues teaching. The two-factor solution for the 26 items incorporated into the items developed for autonomous motivation (extrinsic motivation by identified and intrinsic regulation), those items associated with the evaluation of demotivation, with negative factor loadings. Exclusion of demotivation items assessment in addition to other items with low factor loadings or that loaded on more than one factor, resulted in a 17-item scale, which fit indices and factor loadings were higher than those obtained with the 26-item version.

Conclusion

This study revealed good evidence of factor validity, criterion validity and reliability for the TMT scores. Additionally, the reduced number of items for the assessment of teachers' autonomous and controlled teaching motivation, compared to other instruments available in the literature,

facilitates the use of the scale in investigations in the area, as well as in teaching situations, in teachers' training courses.

The two-dimensional factor structure, revealed in the present study, was different from the results obtained in previous exploratory studies, with other assessment instruments, which used PCA. However, considering that the content of the items grouped around each of the two factors is in agreement with the SDT, which assumes controlled motivation and autonomous motivation as the qualitative differentiation of teacher motivation. The 5-factor model (demotivation, external regulation, introjected, identified and intrinsic) was not supported by the results of the analyses used here. The first justification is that the items are not necessarily sensitive to capture the subtleties of motivational quality; however, they captured the control and autonomy constructs. The items developed to assess demotivation composed, in a negative way, the autonomous motivation factor, with an improvement in its indicators with the exclusion of negative items. It can be inferred that, for this sample of teachers, the lack of intention to act could not be considered part of the motivation self-determination *continuum*, and could be evaluated as a separate construct of the teacher's motivational quality.

Some limitations and future perspectives ought to be considered. The sample of teachers participating in the study was a convenience sample, obtained through online access. New samples must be composed of teachers in service, teaching at different levels and teaching different modalities, that is, new samples compositions should be more representative samples of teachers.

The results described were the result of exploratory analyses of the instrument, which dimensionality should be checked through confirmatory factor analysis and other types of validity tests.

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