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The validation of a scale measuring teaching styles in the Italian context

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Abstract

The teaching style is important because it influences students' school-related motivation, emotion, and performance. The main purpose of this study is to examine psychometric properties and construct validity of a short version of the Problems In School questionnaire (PIS). A multi-group confirmatory factor analysis (MCFA) is performed to test the scale theoretical structure and the metric invariance across teachers' length of service. Results of MCFA are consistent with the hypothesized scale structure and show measurement invariance across different lengths of teaching service. The reliability of the scales in terms of internal consistency ranged from .61 to .69.

Keywords: confirmatory factor analysis, teaching styles scale, validation

1. Introduction

Teachers vary in the interpersonal styles they rely on to teach and motivate students (Deci, Schwarz, Sheinman, Ryan, 1981; Rigby, Deci, Patrick, Ryan, 1992; Ryan & Grolnick, 1986). Some teachers offer extrinsic incentives and consequences for progress that their students show toward a desirable way of thinking, feeling, or behaving. Here the teacher's goal is to control students' behavior, so that desirable states occurred more frequently than the undesirable ones. This style is relatively controlling. Other teachers teach and motivate by identifying and supporting students' interests and by supporting their internalization of the school's values and program. This style is relatively autonomy supportive, because the teacher's aim is to support students' interest in and valuing of education. The teaching style is important because it influences students' school-related motivation, emotion, and performance: students from the classes of more supportive teachers show more intrinsic motivation, higher levels of perceived competence and more self-esteem than pupils in the classes of more controlling teachers (for reviews, Deci, Vallerand, Pelletier, Ryan, 1991; Reeve, 1996, 2002).

Several studies at school have concentrated on the effects of controlling behavior of teachers, such as giving rigid directives, closely supervising and monitoring, or not allowing students the opportunity to express choices and opinions that differ from those proposed by an adult, compared to behaviors that support the autonomy of students, such as providing possibilities of choice, listening, asking students for their points of view (e.g. Reeve, Bolt, Cai, 1999). A frequently used instrument for the assessment of teaching style is the Problems in Schools Questionnaire

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(PIS; Deci, Schwarz, Sheinman, Ryan, 1981). The PIS investigates whether teachers tend to adopt a controlling versus autonomy supportive teaching style with their students. In the Italian context there is a lack of brief instruments for investigating teaching styles. The present study proposes a short version of the PIS scale adapted for the Italian context and examines the factor structure and measurement invariance of this scale.

1.1. Purpose of the study

The aim of the present study is to examine the factor structure and measurement invariance of a short version of the PIS scale adapted for the Italian context.

2. Methods

2.1. Participants and procedures

The subjects were 443 Italian primary school teachers. The teachers worked in 205 primary schools randomly selected from the population of Italian schools. In each school, one or two 4th grade classrooms were randomly selected and all the teachers of reading and/or mathematics and/or science of each class participated in the study. The teachers completed the questionnaire individually.

2.2. Instrumentation

We used a short version of the Problems In School questionnaire (PIS). The original scale (Deci et al., 1981) was composed of eight vignettes, each of which was followed by four items that represented different behavioral options for dealing with the problem that was posed in the vignette: one was Highly Autonomy Supportive (HA), one was Moderately Autonomy Supportive (MA), one was Moderately Controlling (MC), and one was Highly Controlling (HC). Four subscales were thus included PIS: each scale was composed by all the items representing one of the four behavioral options. However, some works (e.g., Reeve, Bolt, Cai, 1999) showed that the Moderately Autonomy supportive subscale (MA) actually acted more like a Slightly Controlling subscale. For this reason, in the short version of the PIS scale only the Highly Controlling and Highly Autonomy supportive items were used. Moreover, two vignettes were left out because they were not suited for the Italian context.

The short version of PIS used in this study was thus composed of six vignettes, each of which was followed by two items, one was Highly Autonomy Supportive (HA) and one was Highly Controlling (HC). Respondents rated the degree of appropriateness of each option (on a five-point scale) for each of the six situations. Thus there were a total of 12 ratings. For purposes of illustration, one of the vignettes is as follows: “*Giovanni is an average student who has been working at grade level. During the past two weeks he has appeared listless and has not been participating during reading group. The work he does is accurate but he has not been completing assignments. A phone conversation with his mother revealed no useful information. The most appropriate thing for Giovanni’s teacher to do is*”. Teachers rated the appropriateness of these two options: “*Let him know that he doesn’t have to finish all of his work now and see if she can help him work out the cause of the listlessness*” (Highly Autonomy supportive) and “*Make him stay after school until that day’s assignments are done*” (Highly Controlling).

Vignettes and items were translated from English into Italian by the authors and then back-translated by a graduate student fluent in both English and Italian. Independent judges then considered the equivalence of the original and the back-translated versions of the questionnaire. After discussing instances of nonequivalence, the final editing was completed.

2.3. Data analysis

A multi-group confirmatory factor analysis (MCFA) was performed using SPSS AMOS 18. In accordance with the theoretical structure of the scale, the tested model consisted of two factors. Measurement invariance was tested

across three categories of length of teaching service (1-19 years; 20-30 years; 31-42 years), in terms of metric invariance, constraining factor loadings to be equal across different lengths of service. In accordance with recommendation by Chen (2007) for comparing two nested models, cut-off values of $\Delta\text{RMSEA} < 0.015$ were used for testing metric invariance.

3. Results

The tested measurement model had the goodness-of-fit indexes as follows: $\chi^2 = 157,99$ ($df=53$), $p < .001$, $\chi^2/df = 2.99$, $\text{GFI} = .94$, $\text{AGFI} = .92$, $\text{RMSEA} = .07$. The reliability of the subscales in terms of internal consistency was: .61 for Highly Controlling scale and .69 for Highly Autonomy supportive scale. The chi-square difference between the baseline model and the measurement invariance model was statistically significant ($\Delta \chi^2 = 32.8$; $df = 24$, $p < .01$), but the difference in RMSEA was smaller than the cutoff criterion of .015 suggested by Chen (2007). According to this last criterion, the two sub-scales can be considered as substantially invariant across lengths of teaching service. Table 1 shows the results of these analyses.

Table 1. Equivalence of the factor structure of the ASRQ scales across teachers' length of service

Subgroup Comparison	Configural invariance models (Baseline models)	Measurement invariance models
χ^2 (df)	299.4 (159)	332.2 (183)
RMSEA	.045	.043

4. Discussion

The aim of this study was to examine the factor structure and measurement invariance of a short version of the PIS scale adapted for the Italian context.

The results showed that the two-factor structure that was hypothesized in accordance with the theoretical structure of the scale was replicated in an Italian teacher sample. The fit indices showed that the posited two factor model is appropriate to explain our data. This result is in agreement with previous validation studies that used the original version of PIS and proposed a two factor structure for the Highly Controlling and Highly Autonomy supportive items (e.g., Deci et al., 1981; Reeve et al., 1999). Moreover, MCFA showed that the correlation between the two factors was not significant. This is consistent both with the theoretical framework that considers Controlling teaching style and Autonomy supportive teaching style as two opposite point on a continuum representing the possible interpersonal styles on which teachers are used to relied on, and with previous validation studies of the PIS questionnaire (e.g., Reeve et al., 1999; Reeve, 2002).

Furthermore, the two subscales showed a certain degree of internal consistency: Cronbach's alpha was .69 for the Highly Autonomy supportive subscale and .61 for the Highly Controlling subscale. The test of metric invariance revealed the presence of substantial measurement invariance across the three categories of length of teaching service.

This short version of the PIS questionnaire provides a means by which researchers can examine the teaching styles adopted by teachers. More specifically, with this short scale it is possible to investigate whether teachers tend to adopt a controlling versus autonomy supportive teaching style with their students. This could be useful in studies that aim at exploring the effects of the teaching styles on students' motivation, emotion, and performance. This is especially important in the Italian context, where there is a lack of brief instruments for investigating teaching styles.

In conclusion however, some limitations in the present study should be pointed out. First of all the particular composition of the participating sample (i.e. primary school teachers) might limit the generalizability of the results: future studies should include teachers from other school grades and from other countries. Secondly we did not

include in the study an observational measure of teachers' style. We were more interested in constructing a short self-report instrument. Even so, it would still be useful to take into consideration in future validation studies also an external criterion based on teacher behavior in the classrooms.

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