Psicología Educativa
ISSN: 1135-755X
ISSN: 2174-0526
Colegio Oficial de la Psicología de Madrid

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Psicología Educativa, vol. 26, no. 1, 2020, pp. 17-26
Colegio Oficial de la Psicología de Madrid

DOI: https://doi.org/10.5093/psed2019a15

Available in: http://www.redalyc.org/articulo.oa?id=613765724003

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Psicología Educativa (2020) 26(1) 17-26

Psicología Educativa

https://journals.copmadrid.org/psed

Teacher as Social Context (TASC) Questionnaire in the Spanish Setting: Teacher Version

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ARTICLE INFO

Article history:
Received 5 July 2019
Accepted 27 September 2019
Available online 12 November 2019

Keywords:
Self-determination theory
Behavioural engagement
Emotional engagement
Secondary Education

A B S T R A C T

This study pioneered the construction or adaptation of a Spanish version of the Teacher as Social Context (TASC) Questionnaire. The current study included a sample of 410 secondary education teachers in Spain. A confirmatory factor analysis was performed using the maximum likelihood estimation; the factorial invariance of the TASC-Spanish teacher measure across genders was analyzed using a multi-group confirmatory factor analysis. Finally, correlational analyses between the three TASC scales (involvement, structure, and autonomy support) and behavioral and emotional engagement were run. The results of this research confirmed the structure of the original instrument maintaining the three basic domains. The measurement model also proved to be invariant across gender. Besides, this study supports the assumption that teachers' perceptions of their own activity to fulfil students' basic psychological needs show a relationship with students' emotional and behavioural engagement, being teachers' involvement the most determinant domain.

El cuestionario *Teacher as Social Context* (TASC) en España: versión para el profesorado

Palabras clave:
Teoría de la autodeterminación
Compromiso conductual
Compromiso emocional
Educación Secundaria

R E S U M E N

Este estudio ha sido pionero en la construcción o adaptación de una versión en español del cuestionario *Teacher as Social Context* (TASC). El estudio actual incluyó una muestra de 410 profesores de educación secundaria en España. Se realizó un análisis factorial confirmatorio utilizando la estimación de máxima verosimilitud; la invarianza factorial de la versión española del cuestionario TASC entre géneros se analizó utilizando un análisis factorial confirmatorio multigrupo. Por último, se realizaron análisis correlacionales entre las tres escalas TASC (participación, estructura y apoyo a la autonomía) y el compromiso conductual y emocional. Los resultados de esta investigación confirmaron la estructura del instrumento original manteniendo las tres dimensiones básicas. El modelo de medición también demostró ser invariable en función del género. Además, este estudio sustenta la suposición de que la percepción de los profesores sobre su propia actividad en relación con la satisfacción de las necesidades psicológicas básicas de los estudiantes muestra una relación con el compromiso emocional y conductual de estos, siendo la implicación de los profesores la dimensión más determinante.

Self-determination theory (SDT) is a framework of motivation and individual development that recognizes relatedness, competence, and autonomy as three basic psychological needs that are important to be satisfied during an individual's life to develop a good psychological growth and healthy personal well-being (Niemiec et al., 2006). In the teaching context, teachers can fulfil their satisfaction through their teaching behaviour in terms of provision of involvement, structure, and autonomy support (Skinner & Belmont, 1993). Furthermore, Stroet, Opdenakker, and Minnaert (2013) revealed that support for one dimension could not compensate for lack of support for the other dimensions.

Several studies have shown the importance of these three teaching behaviours for various student outcomes regardless of their cultural context. In these researches their importance has been related with students' experiences in the classroom, their academic motivation, positive course evaluations, general life satisfaction or engagement, to mention some of them (Maulana, Helms-Lorenz, Irnidayanti, & Van De Grift, 2016; Sheldon, Abad, & Omoile, 2009; Skinner & Belmont, 1993; Stroet et al., 2013).

To assess teacher behaviours, Wellborn, Connell, Skinner, and Pierson (1988) constructed the Teacher as Social Context (TASC) questionnaire, developing one version for students and another

Cite this article as: Iglesias-García, M. T., Maulana, R., Fernández-García, C. M., & García-Pérez, O. (2020). Teacher as social context (TASC) questionnaire in the Spanish setting: Teacher version. *Psicología Educativa, 26,* 17-26. https://doi.org/10.5093/psed2019a15

Funding: This study was supported by the Dutch scientific funding agency (NRO, under grant 405-15-732). Correspondence: fernandezcarmen@uniovi.es (C. M. Fernández García).

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one for teachers. The assumption behind the model as measured by TASC is that the source of motivation is internal within the "self" of students. Besides, when the social context provides conditions for the fulfilment of students' basic psychological needs (i.e., through teacher behaviours), their motivation will flourish (Wellborn et al., 1988). The focus of the present study will be on the teacher version of TASC which was designed to measure teacher behaviour using their own perceptions of their interactions with students in the classroom (Wellborn et al., 1988) and was validated by Skinner and Belmont (1993) in the American context.

Theoretical Framework

Self-determination Theory

Self-determination theory (SDT) is based on the classical distinction between extrinsic and intrinsic motivation, delineating different types of extrinsic motivation depending on their level of locus of control and internalization (Niemiec & Ryan, 2009; Ryan & Deci, 2000). When individuals show intrinsic motivation they follow their interests and show a natural implication in certain activities which are seen as pleasant or which make them feel a spontaneous curiosity. This kind of motivation has also been considered as the most important one when analysing its effects on academic achievement (Taylor et al., 2014) and has also been seen as healthier and self-determined (Amoura et al., 2015; Bailey & Phillips, 2016; Garn, Matthews, & Jolly, 2010; Niemiec et al., 2006; Roth, Assor, Niemiec, Deci, & Ryan, 2009; Soenens & Vansteenkiste, 2010). However, as long as human beings are "homo socius" (Ryan & Deci, 2000), they also need to adapt their personal values to social rules which are commonly practiced and accepted in the society, requiring the use of extrinsic motivation too (Niemiec et al., 2006). To sum up, motivation is important for its own sake as well as for its long-term contribution to students' learning, self-esteem, and persistence in learning over time (Richmond, 1990; Skinner & Belmont, 1993).

Besides, SDT posits that learning environments play a significant role in determining students' inner nature of motivation for learning: interest in learning is recognized as a factor supporting academic achievement, whereas lack of interest is detrimental for students' learning outcomes (Maulana & Opdenakker, 2014). Soenens and Vansteenkiste (2010; see also Soenens, Vansteenkiste, & Niemiec, 2009) argued that controlling contexts which pressed children to think and act in a certain way might have negative consequences for children's psychological adjustment and wellbeing compared with other contexts where children were encouraged to be autonomous or where they were given several options to choose, according to their personal preferences. Therefore, the social context in which students grow has a significant influence on the satisfaction of the three basic needs and on the development of self-determined motivation, whereas at the same time students also have an important influence on the already mentioned social context, provoking certain reactions (Skinner, 1998).

Basic Psychological Needs in the Classroom Context

Educational research has focused the interest on teachers' behaviours that should be effective in promoting the satisfaction of students' basic needs. However, providing students with these needs can be quite challenging for many teachers and requires a complex analysis not only of teaching practices in isolation but also of the reasons to understand why they actually use or do not use certain practices or teaching styles (Katz & Shahar, 2015). Besides, there are studies which emphasize the changing nature of psychological need satisfaction in the school context over time (Ratelle & Duchesne, 2014).

Students' sense of relatedness plays an important role in their academic motivation and performance (Furrer & Skinner, 2003). This need can be fulfilled by teachers in the form of their interpersonal *involvement* with the classroom, interest, respect, and the emotional support they provide (Connel & Wellborn, 1991; Niemiec & Ryan, 2009; Ryan & Deci, 2000). This dimension includes the quality of the relationship between students and teachers too and is opposite to rejection or neglect (Skinner & Belmont, 1993). SDT claims that teachers' interpersonal involvement serves as an enhancing factor for students' sense of belonging, which has an impact on self-determined motivation growth and academic engagement (Furrer & Skinner, 2003; Maulana et al., 2016; Maulana & Opdenakker, 2014; Ryan & Deci, 2000).

In contrast, when students experience teachers' rejection during daily classroom activities, their positive development and learning outcomes are negatively affected, moving from internally motivated behaviour to controlled one. According to Skinner and Belmont (1993), teacher involvement includes teachers' affection (liking, appreciation), attunement (understanding, knowledge about the student), dedication of resources (energy, time), and dependability (availability in case of need) and is a consistent predictor of students' perception. Hence, children whose teachers show high levels of involvement also experience their teachers as more structured and autonomy supportive. On the other hand, teacher behaviour influences student perceived control, which can promote or undermine engagement and thus affect academic performance (Skinner,Wellborn, & Connell, 1990).

Structure refers to the "amount of information in the context about how to effectively achieve desired outcomes" (Skinner & Belmont, 1993, p. 572) and responds to students' need for competence. Teachers can provide structure using several teaching skills like offering support to their students or being clear and consistent in their answers. Structure includes contingency (consistency and predictability of responses), clarity of expectations, instrumental help/support, encouragement, informational feedback, and adjustment of teaching strategies. A central notion is that students will only engage in and value activities they can actually understand and master (Niemiec & Ryan, 2009). Students in well-structured environments have a clearer sense of the actions needed to acquire certain outcomes, so they are more capable to direct their efforts (Grolnick & Ryan, 1989). Hence, structure is considered a precondition for learners to develop a sense of effectiveness (Aelterman et al., 2019). The study by Skinner et al. (1990) concluded that the lower the teachers' contingency and involvement, the less children reported the capacity to execute strategies for achieving success and avoiding failure in school.

Autonomy support points to teaching behaviours which promote students' feelings of volition and internal locus of causality (Reeve, Nix, & Hamm, 2003). To be autonomy supportive, teachers should give students freedom, avoid the use of external pressures/awards, and connect students' life with their school experiences. Autonomy support considers choice (allowing students to follow their own interests and giving them the opportunity to choose between several options), coercive behaviour (control through force or authority), respect (acknowledging the importance of student opinions or feelings), and relevance (providing a rationale for learning activities). Moreover teachers' autonomy supportive or controlling behaviour is associated with their students' motivation style (Amoura et al., 2015; Sosic-Vasic, Keis, Lau, Spitzer, & Streb, 2015).

SDT theory and other theoretical conceptualizations have also considered students' engagement as a key concept. This term includes not only behavioural but also emotional participation in the classroom (Connel & Wellborn, 1991; Skinner, Furrer, Marchand, & Kindermann, 2008), so when students are engaged they show sustained behavioural engagement in learning activities, effort, and persistence on schoolwork accompanied by a positive emotional tone (Skinner & Belmont, 1993; Skinner et al., 1990). Moreover,

research has consistently shown that students' active enthusiastic engagement in learning activities can predict better outcomes (e.g. achievement, retention, adjustment to school, and others) (Finn, 1989, 1993; Fredricks et al., 2011; Opdenakker & Minnaert, 2011; Skinner & Belmont, 1993) and has a relationship with more quality teaching practices which act as mediator between classroom dynamics and student achievement (Furrer & Skinner, 2003; Klem & Connell, 2004; Virtanen, Lerkkanen, Poikkeus, & Kuorelahti, 2013; Rockoff, 2004).

Teacher Perceptions of Teaching Behaviour

The review study by Stroet et al. (2013) indicated that the current literature on teacher behaviour is dominated by the use of students' perceptions, while the use of teachers' perceptions or observations is limited. Using student reports, Sierens, Vansteenkiste, Goossens, Soenens, and Dochy (2009) found that autonomy and structure support were positively correlated with students' self-regulated learning irrespective of their gender. They showed that the effect of structure on students' self-regulated learning depended on the level of autonomy support, suggesting that structure needed to be coupled with at least a moderate amount of autonomy support to reveal a positive association with self-regulated learning. Hence, structure seemed to provide students the necessary know-how to use self-regulatory strategies, while autonomy support provided students with the necessary energy to effectively engage in these self-regulatory strategies. Zimmer-Gembeck, Chipuer, Hanisch, Creed, and McGregor (2006), basing their study on students' perceptions, demonstrated that academic engagement depended on students' representation of school meeting needs for autonomy, relatedness, and competence. In general, numerous studies have shown that students' perceptions of teaching behaviour are significantly related to their motivation and engagement (see Stroet et al., 2013 for a detailed review). With a transcultural perspective, several studies (Erturan-Ilker, Quested, Appleton, & Duda, 2018; Taylor & Lonsdale, 2010) also focused their aims on students' perceptions of their teachers' autonomy support and their psychological need satisfaction, obtaining interesting differences depending on subjects.

Because both students' and teachers' perceptions of teaching behaviour are important for students' outcomes (Stroet et al., 2013), there is a need to deepen insight into teachers' conceptions about their interactions with their students. Nevertheless, Skinner and Belmont (1993) showed that both measures (student and teacher perspective) were positively, though moderately, correlated.

Although Aelterman's et al. (2019) study developed in Flanders adopts an integrative perspective to analyse the three main psychological needs and how they are related to each other, the majority of existing research studied teaching behaviour using the SDT dimensions in a fragmented way. For example, Skinner et al. (2008) analysed teachers' perceptions of teaching behaviour using combined measure components of structure and involvement and found that teachers' perceived teaching behaviour was related to students' behavioural engagement. Furthermore, there is a study focusing on one sub-dimension of teacher involvement called affection. This research showed that teachers' perceived affection was related to students' engagement (Kosir, Socan, & Pecjak, 2007). The study of Cheon et al. (2019) developed with Korean students and teachers, on the other hand, focused its attention only on one of the three psychological needs central to Self-determination Theory, autonomy, finding that when learning activities and teacher-student interactions were indifferent to students' need for autonomy, then students likely tended toward a state of autonomy dissatisfaction and disengagement. Roth, Assor, Kanat-Maymon, and Kaplan (2007) focusing on teachers' reports concluded that teachers' autonomous motivation for teaching was a determinant factor for autonomy-supportive teaching, students' autonomous motivation for learning, and for teachers' well-being. Except for the Taylor and Ntoumanis' (2007) and Taylor, Ntoumanis, and Standage's (2008) research that studied in the British context the relationship between teachers' report of their provision of involvement, structure, and autonomy support, and students' perceived psychological need satisfaction and self – determination, to date, we found limited studies investigating the relationship between teachers' perceptions of the three dimensions of teaching behaviour and students' outcomes separately or together as a combined construct. Therefore, results of the current study can provide a more complete picture of students' psychological need satisfaction in a more integrated way.

In addition, studies referring to gender differences from teachers' perspective also remain scarce. Gender differences were only evidenced in two aspects included in the study developed by Taylor et al. (2008), who concluded that the provision of instrumental help and support was stronger in males than in females, whereas the relationship among teachers' autonomous orientation and their psychological need satisfaction was stronger in females than in males. Similarly, Opdenakker et al. (2012) reported better results for male teachers regarding their involvement and interpersonal relationships with students. Rather, in contrast to this finding, other studies have shown that classroom environments were less supportive in male than in female teacher classes (Van Petegem, Creemers, Rossel, & Aelterman, 2005). Because teacher gender is a personal characteristic that is viewed as an important determinant of teaching behaviours, this variable is included in the current study as a grouping variable to assess construct invariance of teaching behaviour. Thus, this background characteristic is typically used in the construct invariance testing to show whether differences in mean scores between the two genders represent true differences in construct, not contaminated by construct-irrelevance variance unique to the two groups (Ogg, Brinkman, Dedrick, & Carlson, 2010).

Aims of the Study

In the present study we aim to contribute to the body of research by investigating the psychometric quality of the teacher version of TASC in the Spanish context. The validated teacher measure of teaching behaviour will be useful for future research investigating the relevance of the three teaching behaviour components for various student outcomes. Given that English is not commonly practiced in Spanish-speaking contexts, the Spanish version of the instrument will be highly beneficial for research and practice involving classroom practices. Moreover, as long as the population of Spanish-speaking contexts is notable, having validated instruments in this language would contribute to providing more insights about teaching and learning in those geographical areas. In addition, these instruments could be used as a diagnostic tool for improving teaching behaviour and schools in Spanish-speaking contexts more generally.

Undoubtedly, this is a first step which can allow future international comparative studies to test differences between countries and diverse conceptions of education. The present study was motivated by previous research indicating that teachers' behaviours might universally be important for stimulating students' self-interest in learning, regardless of their cultural contexts (Maulana, Helms-Lorenz, & Van de Grift, 2015) and the fact that even in collectivist societies teachers' autonomy support remained important (Soenens, Vansteenkiste, & Van Petegem, 2015). This is an interesting point as long as the emphasis given to social values such as conformity, social harmony, respect to the elders, and obedience to teachers' rules in collectivist societies may introduce important differences in the satisfaction of the already mentioned basic needs (Maulana & Opdenakker, 2014; Maulana, Helms - Lorenz & Van de Grift, 2015; Maulana et al., 2016).

Our long-term aim is to test this in the Spanish teaching context specifically, and Spanish-speaking contexts more generally. Prior to

Table 1. Means, Standard Deviation, Skewness, and Kurtosis of TASC

Items		Means	Standard Deviation	Skewness	Kurtosis
1	The students of this class are easy to like	2.983	0.7043	-0.693	1.010
2	I enjoy the time I spend with the students of this class	3.222	0.6112	-0.422	0.705
3	The students of this class are difficult to like	3.432	0.6382	-0.735	-0.200
4	Teaching the students of this class isn't very enjoyable for me	3.478	0.6749	-1.215	1.351
5	I know a lot about what goes on for the students of this class	3.205	0.4865	0.448	0.155
6	I know the students of this class well	3.085	0.5186	0.116	0.610
7	I don't understand the students of this class very well	3.310	0.6009	-0.458	0.486
8	I don't know very much about what goes on for the students of this class outside of school	2.583	0.7395	0.113	-0.366
9	I spend time with the students of this class	2.890	0.6561	-0.248	0.187
10	I talk with the students of this class	3.295	0.5446	0.047	-0.571
11	When the students of this class do not do as well as they can, I can make time to help them find ways to do better.	3.107	0.5355	-0.004	0.779
12	The students of this class can count on me to be there for them	3.380	0.5154	0.169	-1.238
13	Sometimes I feel like I can't be there for the students of this class when they need me	2.639	0.7733	0.022	-0.456
14	I can't always be available to the students of this class	2.456	0.7329	0.396	-0.191
15	When I discipline the students of this class, I always explain why	3.505	0.5291	-0.418	-0.486
16	I let the students of this class get away with things I normally wouldn't allow	2.185	0.6921	0.270	0.072
17	I find it hard to be consistent with the students of this class	3.351	0.6321	-0.739	0.918
18	I don't always have time to follow through with the students of this class	2.761	0.7827	0.048	-0.698
19	I talk with the students of this class about my expectations for them	3.173	0.5477	-0.013	0.428
20	I try to be clear with the students of this class about what I expect of them in class	3.412	0.5170	0.090	-1.379
21	I change the rules about school work for the students of this class	2.988	0.7147	-0.467	0.300
22	Sometimes I feel I don't make my expectations clear to the students of this class	2.963	0.7275	-0.442	0.177
23	When the students of this class don't comprehend the material, I take a different approach	3.327	0.4950	0.434	-1.076
24	When the students of this class don't understand something, I explain it a lot of different ways	3.412	0.5310	-0.038	-1.168
25	I can't tell when the students of this class are keeping up with me	3.241	0.5747	-0.293	0.803
26	It's hard to know when the students of this class are ready to go on to new material	3.127	0.6084	-0.267	0.448
27	I show the students of this class different ways to solve problems	3.183	0.5169	-0.098	1.865
28	I find it difficult to tell when the students of this class need help	3.183	0.6041	-0.506	1.407
29	I find it hard to teach the students of this class in a way they can understand	3.295	0.6122	-0.592	1.058
30	I try to give the students of this class a lot of choices about classroom assignments	3.163	0.5976	-0.074	-0.347
31	My general approach with the students of this class is to give them as few choices as possible	3.407	0.5702	-0.387	-0.278
32	It's better not to give too many choices to the students of this class	3.322	0.6476	-0.591	0.126
33	I have to lead the students of this class through their schoolwork step by step	2.449	0.6841	-0.113	-0.252
34	When it comes to assignments, I'm always having to tell the students of this class what to do	2.378	0.6492	0.084	-0.164
35	I find myself telling the students of this class every step to make when it comes to schoolwork	2.549	0.6771	-0.107	-0.183
36	I let the students of this class make a lot of their own decisions regarding schoolwork	2.739	0.6276	-0.155	0.001
37	I can't let the students of this class do things their own way	2.929	0.6868	-0.227	-0.071
38	I can't afford to let the students of this class decide too many things about schoolwork for themselves.	2.917	0.6355	-0.160	0.075
39	I explain to the students of this class why we learn certain things in school	3.293	0.4966	0.424	-0.722
40	I encourage the students of this class to think about how schoolwork can be useful to them	3.322	0.5405	-0.048	-0.137
41	It is difficult to explain to the students of this class why what we do in school is important	3.098	0.6709	-0.311	-0.078

realizing the long-term aim, the construct and predictive validity of the teaching behaviour should be established first. More specifically, the main research questions are:

1. To what extent is the Spanish teacher version of the TASC questionnaire a reliable and valid measure for use in secondary education in Spain?
2. How do teachers perceive themselves in terms of their provision of involvement, structure, and autonomy support to their students?

Method

Sample and Procedure

The current study included a sample of 410 secondary education teachers teaching 7,114 students in Spain. The teachers sample comprised 166 (40.5%) males and 244 (59.5%) females. Only 9% of the teachers had given classes to the selected group of students for more than 3 years. For the majority of the teachers (74.2%) it was their second or third year with the students, while the remaining teachers (16.8%) gave lessons to the group for the first time. Regarding the school type, 46.1% of the teachers taught in general schools, 4.1% in vocational schools, and 49.8% in multitrack schools. The majority of the teachers (69%) worked in public schools whereas 31% taught in private ones. The data involved 62% of language and social science teachers, 20.7% of maths and science teachers, and 17.3% of vocational education and training subjects teachers.

Teachers participated on a voluntary basis. Participants were not compensated for joining the study. Researcher-school agreement was made prior to conducting the survey in schools.

Measure

To measure teachers' perceptions of their own teaching behaviours, the Teacher as Social Context (TASC) Questionnaire (Wellborn et al.,

1988) was used. The original questionnaire was translated and back-translated for use in the Spanish context following the international guideline provided by Hambleton, Merenda, and Spielberger (2004).

The questionnaire consisted of 41 items measuring three dimensions: teachers' involvement (14 items), structure (15 items), and autonomy support (12 items), and provided a 4-point Likert type response format from 1 (*strongly disagree*) to 4 (*strongly agree*). The reliability of the original instrument ranged between .83 and .89 (Belmont, Skinner, Wellborn, & Connell, 1992).

To establish the predictive validity of the TASC instrument, the current study included teachers' report on students' academic engagement as a criterion. The academic engagement scale developed by Skinner, Kindermann, and Furrer (2009) was used. The scales consisted of 10 items measuring behavioural engagement (5 items) and emotional engagement (5 items) using a 4-response category (1 = *completely not true*, 4 = *completely true*). The reliability of the behavioral engagement scale was .82 and .81 in the case of emotional engagement.

Analytic Strategy

Preliminary analysis. Data was firstly explored in order to verify compliance with statistical assumptions, and to detect atypical cases or missing values that could pose bias for the analyses. The percentage of missing cases was between 0.2% and 4.1%. The MCAR test (Little, 1988) was applied to analyse the pattern and type of missing values (χ^2 = 1638.324, *df* = 1711, *p* = .894), concluding they were MCAR (missing completely at random). When small MCAR losses (around 5%) are found, any imputation method seems to reasonably replicate the population parameters (Fernández-Alonso, Súarez-Álvarez, & Muniz, 2012), so EM (expectation-maximization) procedure (Dempster, Laird, & Rubin, 1977) was selected.

Main analyses. The questionnaire was then validated according to the basic specifications of the classical test theory (CTT) (Gil Pascual, 2011; Muñiz, 2000) analysing: (1) response behaviour to items (frequency distribution and percentages, items with missing data, removing items with a percentage of missing exceeding 10%, and ceiling and floor effect removing those lower than 15% in the highest and lowest response options, respectively); (2) measures of central tendency and variability; and (3) degree of compatibility of items with the normal curve (skewness and kurtosis), removing the items with skewness below 2 and/or kurtosis below 7 (Curran, West, & Finch, 1996). Before performing these analyses, negatively-worded items were inverted (reverse coded).

Central tendency measures, measures of dispersion and of the shape of distribution are demonstrated in Table 1. High mean values have been obtained for most items (values between 2.185 and 3.505), keeping the standard deviation below 0.8. All the items complied with the criteria of the normal curve, with asymmetry values below 2 and kurtosis values below 7.

To confirm whether the questionnaire was structured in the three factors indicated by the authors of the original questionnaire (Wellborn et al., 1988), a confirmatory factor analysis (CFA) was performed using the maximum likelihood estimation and the covariance matrix of items as input. The 1-factor model was initially tested by combining the 41 elements together, and the fit of the model was compared with the competing three-factor model. Analyses have been done using the AMOS module of the statistical package SPSS 22.0. The goodness-of-fit of the proposed model has been evaluated applying various common fit indexes: *p* value associated with the chi-square statistic, verifying the null model against the hypothesised model; Standardised Root-Mean-Square Residual (SRMR); Root-Mean-Square Error of Approximation (RMSEA); Goodness-of-Fit Index (GFI); Tucker Lewis Index (TLI); Comparative Fit Index (CFI); Parsimonious Normed Fit Index (PNFI); and Parsimonious Comparative Fit Index (PCFI). The cut-off for CFI, TLI, CFI values was established above .90 for a good fit criteria (Bentler & Bonnet, 1980); PCFI and PNFI values above .50 (James, Mulaik, & Brett, 1982) and RMSEA and SRMR values below .08 for an acceptable fit (MacCallum, Browne, & Sugawara, 1996), or close to .06 for a good fit (Hu & Bentler, 1999; Vanderberg & Lance, 2000). For the chi-square index, the probability of $\chi^2 > 0.05$ indicates a good fit, although this index is very sensitive to sample size. Finally, for the ratio χ^2/gl, values lower than 2 indicate a good fit (Lévy, Martín, & Román, 2006).

The factorial invariance of the TASC-Spanish teacher measure across genders was analysed using a multi-group confirmatory factor analysis (MGCFA). According to Cheung and Rensvold (2002), measurement invariance testing should satisfy two criteria: a) the measurement model should be adjusted to each group and b) a multigroup analysis should examine the following invariance types: configural invariance (unconstrained model), metric invariance (weak invariance), scalar invariance (strong invariance), and residual invariance (strict invariance).

Evaluation of measurement invariance was based on the examination of the model fit and the interpretation of changes in CFI and RMSEA values. Following the recommendations by Cheung and Rensvold (2002), a ΔRMSEA < .015 and a ΔCFI < .01 from less-constrained (configural) to more-constrained (scalar) models were used as cut-off for measurement invariance between nested models. The robust maximum likelihood chi-square statistic (χ^2) was also provided, but due to its sensitivity to sample size it cannot be considered highly informative (Wu, Li, & Zumbo, 2007). Correlational analyses were also performed.

Finally, to investigate the average level of perceived involvement, structure, and autonomy support, descriptive analyses were conducted. Proportions of teachers in terms of perceived teaching behaviour in the category low (-1*SD*), moderate (-1*SD* < *M* < +1*SD*), and good (+1*SD*) were estimated; χ^2 was run out to analyse relationships between teachers' gender and each of the categories.

Results

Factor Structure of the TASC-Spanish Teacher Measure

Results of the confirmatory factor analysis using the 41 items showed that the 1-factor model could not be supported, as indicated by the following fit indexes: $\chi^2(779) = 3832.814$, $p < .000$, $\chi^2/gl = 4.920$, RMSEA = .098, SRMR = .0975, GFI = .630, TLI = .442, CFI = .470, PCFI = .447, PNFI = .397. Similarly, the competing 3-factor model indicated a poor fit: $\chi^2(776) = 3570.768$, $p < .000$, $\chi^2/gl = 4.602$, RMSEA = .094, SRMR =. 0944, GFI = .638, TLI = .488, CFI = .515 PCFI = .488, PNFI = .433. Several standard errors interactions obtained from modification indexes were considered and new analyses were carried out to obtain a better fit in both models (Table 2).

The 3-factor model was retained as long as it showed better fit than the 1-factor solution. Nevertheless, the degree of adjustment obtained could not be considered perfect. In fact, the analysis of the factorial weights made it advisable to suppress those items that did not reach at least a weight equal to .30 in any of the factors (Table 3).

Table 2. Fit Indexes for the 1-Factor and 3-Factor Models

Model	χ^2	*gl*	χ^2/gl	RMSEA	SRMR	GFI	TLI	CFI	PCFI	PNFI
1-factor	1740.452	756	2.302	.056	.0737	.804	.815	.829	.765	.678
3-factor	1323.972	715	1.852	.046	.0683	.851	.879	.894	.780	.697

Table 3. Standardized Regression Weights

Item	Item content	Involvement	Structure	Autonomy
10	I talk with the students of this class	.677		
12	The students of this class can count on me to be there for them	.633		
11	When the students of this class do not do as well as they can	.582		
7	I don't understand the students of this class very well	.573		
5	I know a lot about what goes on for the students of this class	.502		
6	I know the students of this class well	.492		
2	I enjoy the time I spend with the students of this class	.485		
9	I spend time with the students of this class	.402		
3	The students of this class are difficult to like	.371		
8	I don't know very much about what goes on for the students of this class outside of school	.339		
1	The students of this class are easy to like	.317		
4	Teaching the students of this class isn't very enjoyable for me	.312		
14	I can't always be available to the students of this class	.241		
13	Sometimes I feel like I can't be there for the students of this class when they need me	.166		
24	When the students of this class don't understand something, I explain it a lot of different ways		.613	
23	When the students of this class don't comprehend the material, I take a different approach		.593	
27	I show the students of this class different ways to solve problems		.573	
20	I try to be clear with the students of this class about what I expect of them in class		.568	
19	I talk with the students of this class about my expectations for them		.539	
29	I find it hard to teach the students of this class in a way they can understand		.539	
25	I can't tell when the students of this class are keeping up with me		.478	
28	I find it difficult to tell when the students of this class need help		.464	
15	When I discipline the students of this class, I always explain why		.450	
17	I find it hard to be consistent with the students of this class		.406	
26	It's hard to know when the students of this class are ready to go on to new material		.394	
22	Sometimes I feel I don't make my expectations clear to the students of this class		.354	
18	I don't always have time to follow through with the students of this class		.320	
21	I change the rules about school work for the students of this class		.109	
16	I let the students of this class get away with things I normally wouldn't allow		-.022	
40	I encourage the students of this class to think about how schoolwork can be useful to them			.628
39	I explain to the students of this class why we learn certain things in school			.618
41	It is difficult to explain to the students of this class why what we do in school is important			.595
31	My general approach with the students of this class is to give them as few choices as possible			.540
32	It's better not to give too many choices to the students of this class			.519
30	I try to give the students of this class a lot of choices about classroom assignments			.482
38	I can't afford to let the students of this class decide too many things about schoolwork for themselves			.303
37	I can't let the students of this class do things their own way			.282
36	I let the students of this class make a lot of their own decisions regarding schoolwork			.254
35	I find myself telling the students of this class every step to make when it comes to schoolwork			.116
34	When it comes to assignments, I'm always having to tell the students of this class what to do			.076
33	I have to lead the students of this class through their schoolwork step by step			.023

Based on the inspection of factor loadings, we found a number of items below the common cut-off of .30. This suggested that some items were not sufficiently contributing to measure the intended construct. Subsequently, the model was run out again deleting these items (starting with those which showed the lowest factor loadings). The excluded items were: items 1, 4, 13, and 14 (involvement), items 16 and 21 (structure), and items 33, 34, 35, 36, 37, and 38 (autonomy).

Finally, with a questionnaire consisting of the remaining 29 items, the fit indexes were: χ^2 = 624.317 (341), p < .000, χ^2/gl = 1.831, RMSEA = .045, SRMR = .0572, GFI = .900, TLI = .914, CFI = .927, PCFI = .779, PNFI = .718. Therefore, the three dimensions of teaching behaviour were supported satisfactorily.

Factorial Invariance of the TASC-Spanish Teacher Measure across Genders

The contrast of the factorial equivalence test was initially performed with a preliminary analysis. The goodness of fit of the TASC-Spanish teacher measure structure in males and females samples was examined separately using the 29 items set. The fit indexes were adequate and similar to those of the general model. For males, the fit indexes were χ^2 = 509.364 (341), p < .000, χ^2/gl = 1.494, RMSEA = .055, SRMR = .0668, GFI = .829, TLI = .895, CFI = .912, PCFI = .766, PNFI = .655; for females, the indexes were χ^2 = 555.551 (341), p < .000, χ^2/gl = 1.629, RMSEA = .051, SRMR = .0658, GFI = .863, TLI = .883, CFI = .902, PCFI = .757, PNFI = .660. Hence, we can conclude that the three factor model showed a satisfactory fit both for male and female samples.

Multisampling analyses were also performed, creating new nested models (Table 4). First, the configural invariance (M1) was examined (the same form without any restriction). The results showed adequate fit indexes (RMSEA = .037, CFI = .906), indicating that the factorial structure of teaching behaviour remained invariant in the two compared groups. This model was considered as a reference for the subsequent nesting of restrictions. The following three hypotheses enunciated three new models, each of which was nested in the previous one. Model 2 (M2) proposed equivalence in the matrix of factor loadings (metric invariance); the model showed

Table 4. Fit Indexes for the Invariance of the Measurement model of the TASC-Spanish Teacher Measure between Genders

Model	χ^2	*gl*	χ^2/gl	$\Delta\chi^2$	Δgl	*p*	CFI	ΔCFI	RMSEA	ΔRMSEA
Male	509.364	341	1.494			.000	.912		.055	
Female	555.551	341	1.629			.000	.902		.051	
M1. Configural invariance	1065.067	682	1.562			.000	.906		.037	
M2. Metric invariance	1100.085	708	1.554	35.018	26	.000	.904	.002	.037	.000
M3. Scalar invariance	1121.915	714	1.571	21.830	6	.000	.900	-.004	.037	.000
M4. Residual invariance	1277.600	776	1.646	155.685	62	.000	.877	-.023	.040	.003

Table 5. Correlations between TASC Scales and Student Behavioural and Emotional Engagement, Means, Standard Deviation, and Scores on the TASC Scales (%)

	I	S	A	BE	EE	Criteria (% of teachers)		
						Low	Moderate	Good
Involvement (I)						18.8	66.3	14.9
Structure (S)	.59**					7.8	69.8	22.4
Autonomy (A)	.55**	.68**				8.5	67.3	24.1
Behavioural Engagement (BE)	.51**	.39**	.42**					
Emotional Engagement (EE)	.54**	.42**	.46**	.73**				
M	3.15	3.22	3.26	2.82	3.01			
SD	0.35	0.34	0.41	0.48	0.42			

*$p < .05$, **$p < .01$

adequate fit indexes (RMSEA = .037, CFI = .904), showing very similar fit indexes to the ones obtained in M1 (lower difference between fit indexes: ΔRMSEA < .015, ΔCFI < .01), indicating that there were no differences between the baseline model (M1) and the constraint model (M2); therefore, there were no differences between the factor loadings of the two evaluated samples (male and female). Model 3 (M3) tested the equivalence between intercepts (scalar invariance); the fit indexes showed an acceptable fit (RMSEA = .037, CFI = .900); when comparing the indexes with those obtained in the base model (M1), the difference between the CFI and RMSEA values did not exceed the criterion value; therefore, the invariance of intercepts was supported. In model 4 (M4), the variances and covariances of the error were restricted to be equal between the groups (residual invariance). Because the fit indexes of the model were not adequate (ΔRMSEA was lower than .015, but ΔCFI was -.023), the invariance of the residuals could not be fully supported.

The global reliability of the 29 items was $\alpha = .90$, indicating good internal consistency. For each separate dimension, the reliability values were .78 (involvement), .82 (structure), and .77 (autonomy support), indicating that the three dimensions were sufficiently reliable.

TASC-Spanish Teacher Measure and Students' Academic Engagement

Correlational analyses between the three TASC scales and behavioral and emotional engagement were run (Table 5). In general, the three domains correlated slightly stronger with emotional engagement ($r = .42$-$.54$) than with behavioral engagement ($r = .39$-$.51$). Although small to moderate in magnitude, involvement seemed to be the domain with the strongest relationship with both behavioral and emotional engagement. In all cases, correlations showed higher values with students' emotional engagement than with behavioural one.

The majority of teachers perceived themselves as moderately good in involvement, structure, and autonomy support (Table 5). This fact means that the teachers who formed this sample have developed a positive image of their own teaching activity. It is outstanding that more than 20% of teachers rated themselves as good in providing structure and autonomy. On the other hand, there is an important number of teachers who perceived themselves in a low level of involvement provision. It is also this dimension the one that showed the lowest rating in the good category as perceived by teachers.

Table 6. Percentages of Teachers' Perceived Level in TASC Scales according to their Gender

	Low		Moderate		Good	
	Male	Female	Male	Female	Male	Female
Involvement	19.9	18.0	69.3	64.3	10.8	17.6
Structure	7.2	8.2	72.3	68.0	20.5	23.8
Autonomy	7.2	9.4	65.7	68.4	27.1	22.1

No significant statistical differences were obtained when considering gender in any of the domains: involvement ($\chi^2 = 3.594$, $p = .166$), structure ($\chi^2 = 0.851$, $p = .653$), and autonomy ($\chi^2 = 1.686$, $p = .430$). Regarding involvement, it should be noted that the percentage of teachers who had a good perception of their own activity was higher in women than in men (Table 6). A similar tendency could be observed in structure although differences between male and female teachers were slighter. Finally, better ratings were obtained in males than in females when the focus was on good perceived level of autonomy.

Discussion

This study provides additional support and a preliminary look for the utility of SDT theory in a cross-cultural context, extending previous work in this area by examining an understudied group, secondary education teachers in Spain. The novelty of this study is to attempt the construction or adaptation of a Spanish version of the TASC questionnaire in order to achieve a complete picture of teachers' effect on student engagement and to measure in a more precise and rigorous way this effect. This was necessary for several reasons. First, only about 71% of the original items could directly be used in this context. Thus, future analysis would need to deepen this fact, although we can actually affirm that contextual reasons regarding the educational system in Spain and changes in teachers' professional conception and attitudes may explain these differences. Secondly, because research literature in the Spanish speaking countries lacks a strong and tested theory of how teachers provide the satisfaction of

students' psychological basic needs, having a validated and adapted instrument will allow the development of this knowledge in Spanish speaking countries and will enable the comparison with other countries with a longer tradition in the application of SDT.

Taken as a whole, the results of this research confirmed the structure of the original instrument. Our research with a sample of teachers maintained that the three domains of the original instrument were visible in the Spanish context too. Hence, confirmatory factor analysis revealed that the final version of the instrument displayed acceptable levels of fit and that the reliability of each of the domains could also be considered as satisfactory. Finally, the measurement model proved to be invariant across gender, indicating that the structure and number of factors was the same for males and females.

Therefore, this study supports the assumption that teachers' perceptions of their own activity to fulfil students' basic psychological needs could be studied in terms of involvement, structure, and autonomy support. Additionally, the study provided the first attempt to explore the relationship between teaching perceptions of their teaching activity and student engagement. Despite the fact that the instrument showed an intense relationship with students' emotional engagement in the secondary education context in Spain, the relationship with behavioural engagement remained significant as well. According to the differences obtained by Skinner et al. (2009) between teachers' and students' perceptions regarding behavioural and emotional engagement, further research needs to be enhanced to test if this finding is also present in our studies.

The results of the present study have implications both for practice and for research. Our findings are consistent with other empirical evidence for the link between teachers' behaviours and students' academic engagement (Maulana et al., 2016; Maulana & Opdenakker, 2014; Furrer & Skinner, 2003; Hattie, 2009; Stroet et al., 2013). Regarding the three domains included in the scale, teachers' involvement seemed to be the most determinant in relation with behavioural and emotional engagement. This issue could be expected given the content of this domain referred to teachers' interest, affection, understanding, support to students or teachers' effort to encourage students' sense of belonging which has an impact on their academic engagement and self-determined motivation (Connell & Wellborn, 1991; Furrer & Skinner, 2003; Ryan & Deci, 2000). This finding is aligned with the results stated in the research conducted by Furrer and Skinner (2003), who found that students who reported higher sense of relatedness showed greater emotional and behavioural engagement in school. Hence, this study suggests challenges for teachers and educational practitioners to be more aware of their behaviour and pay more attention to their interpersonal approach fostering student engagement.

Several studies have also shown differences in students' engagement according to personal factors such as gender or age (Furrer & Skinner, 2003; Lietaert, Roorda, Laevers, Verschueren, & De Fraine, 2015). Further research about this fact is needed about the influence of these and other factors to understand the relationship between these biographical factors, teachers' actions inside the class, and student academic engagement.

Most teachers perceived themselves as moderate in terms of their provision of involvement, structure, and autonomy support to their students. Changes in the profile of secondary education students in Spain in the last decades may help us to understand teachers' need to undertake a new professional socialization process (Esteve-Zarazaga, 2003; Peña-Calvo, 1993) and, as a direct consequence of it, their modest perception of their own professional activity. Nevertheless, there is still room for improvement when referring to involvement as long as nearly 20% of the teachers perceived themselves in a low level. Therefore, efforts should be made to help teachers improve their skills regarding involvement. This diagnosis directs us to teachers' initial training and the need to review its syllabus with this focus in mind. Nevertheless, to understand and contextualize this fact referred to the perceived low level in involvement we may also consider that due to regular shifts in classroom and school organization during the different educational levels, students have less frequent and intense contact with teachers in secondary education than, for instance, in primary education, so a decline in teachers' involvement may be understandable (Skinner, 1998) and so does students' motivation and other parameters (Anderson, Christenson, Sinclair, & Lehr, 2004). To sum up, this and other factors need to be taken into account and may explain the modest perception of teachers regarding their own capacity to promote involvement. However, it should not be forgotten that involvement is of great concern as long as empirical research has shown that this domain is a consistent predictor of student behavioural and emotional engagement both directly and through their effects on students' perceptions of their teachers (Lietaert et al., 2015; Skinner & Belmont, 1993; Skinner et al., 2008).

To sum up, we now have a validated instrument for capturing teacher perceptions of their activity with adequate levels of psychometric quality. The current instrument may allow us to asses teachers' strengths and weaknesses in the fulfilment of their students' psychological basic needs in Spain and potentially in other Spanish speaking contexts (e.g., Latin American countries). Further analyses may give us determinant information as long as SDT theory has revealed that these three domains are crucial to understand students' wellbeing, satisfaction, and motivation (Niemiec et al., 2006). On the other hand, these conclusions might be useful to improve not only teachers training but also to support their professional development referred to effective teaching behaviour which has usually been less intense (Katz & Shahar, 2015; Korthagen & Evelein, 2016). Like previous studies reinforcing the advantages of continuous formative support to upgrade the quality of teachers' classroom motivating style, behaviours, and its benefits for student achievement (Cheon, Reeve, Lee & Lee, 2018; Early et al., 2016), we also consider that the conclusions obtained have practical significance. Therefore, they give researchers, practitioners, teachers' trainers, and educational authorities clues based on the knowledge regarding teachers' behaviour inside the classrooms, to stablish new priorities in teachers' initial training and continuous professional development, so that they reflect real needs and respond to students' basic psychological needs. The instrument may also be used as a tool to assess the improvement or evolution experienced by those teachers who may have participated in training experiences (pretest-postest design).

Limitations and Further Directions for Future Research

Some limitations should be taken into consideration when interpreting these findings. First, the sample was formed by teachers from a specific geographic and cultural context. Caution is needed when trying to extend the findings to other contexts or teachers' characteristics because of the restricted diversity within the sample regarding ethnicity. Future replication studies in this line should specifically aim to include more geographically diverse Spanish samples. This wider research may also allow a complete explanation concerning the removed items and why they do not contribute to measuring a certain scale in Spain.

Second, teachers participated in this study on a voluntary basis. Future research should attempt to increase the number of participants and randomly sample them. It would also be important to analyse differences between teachers of diverse subjects or who are giving their classes in different educational levels.

Third, teachers self-reported their behaviours inside the classrooms, what makes data susceptible to desirability biases. A multi-informant approach with alternative measures of teacher behaviour (e.g., students' opinion, external observations) should be used in the future to establish the extent of potential bias in teachers' reports.

Fourth, the cross-sectional design of the current study did not allow investigation of causal relationships between psychological need satisfaction and student engagement. Therefore, future research using experimental or longitudinal designs is needed to examine the causal and long-term effects. This perspective may allow the exploration of the dynamic nature of teachers' provision of relatedness, competence, and autonomy support, repeating the measures and developing a system to follow the evolution of teachers and groups of students.

Finally, the situations involved in the current research are mainly focused on the context of secondary education, which raises questions about the generalizability of the results to other age groups. Future studies need to investigate the validity of the Spanish version of TASC in other educational levels, thereby making the necessary adjustments, so that the items selected optimally match up with the internal diversity of each of these stages.

Conflict of Interest

The authors of this article declare no conflict of interest.

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