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Teacher and school determinants of teacher job satisfaction: a multilevel analysis

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ABSTRACT

Teacher job satisfaction is an essential factor for teachers' and school effectiveness and students' academic and educational achievement. The present research aims to identify variables that contribute to job satisfaction in a Portuguese sample of lower secondary education teachers, using data from the Teaching and Learning International Survey (TALIS) 2013. Two questionnaires were used to collect data: a school principal's questionnaire, and a teacher questionnaire. Hierarchical linear modelling was used to study the relation of school-level and teacher-level variables to job satisfaction. The results show that teacher-level variables are better predictors of teacher job satisfaction than school-level variables, except for the variable public/private school. In addition, variables related to interpersonal relations emerge as the most significant predictors of job satisfaction. The results suggest that, in order to improve, schools must take care of interpersonal relations, mainly at the classroom level, where most of the perceived job satisfaction seems to rest.

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Introduction

Teachers' action is one of the most critical, if not the most critical, variable for student learning (Ingersoll & Collins, 2017). Research has consistently shown that students' engagement, persistence, and commitment to learning are all strongly related to teachers' daily classroom action (Baker et al., 2000; Martin et al., 2012; Wu et al., 2010). However, teachers are more likely to be effective if they are satisfied with their job and current work conditions (Skaalvik & Skaalvik, 2014). Researchers have suggested that students of teachers who are satisfied with their jobs and have a strong sense of psychological well-being tend to be more successful academically than those who are emotionally exhausted or unsatisfied (Arens & Morin, 2016; Day, 2008; McInerney et al., 2018).

Teachers' job satisfaction has been associated with teacher well-being and effective school functioning (Shoshani & Eldor, 2016). Teachers who are satisfied with their jobs are typically more motivated, more enthusiastic, and more committed to the school's mission (Li & Wang, 2016; Shoshani & Eldor, 2016). In comparison with unsatisfied teachers, satisfied teachers tend to be less motivated to relocate from their schools or to abandon

the teaching profession (Gersten, 2001; Skaalvik & Skaalvik, 2011). Satisfied teachers also miss fewer working days, show higher levels of self-efficacy, and demonstrate better mental health (Nakata et al., 2013; Skaalvik & Skaalvik, 2014).

The Teaching and Learning International Survey (TALIS), conducted in 2008 and 2013, examined a large number of issues related to the teaching profession, including teachers' job satisfaction (Organisation for Economic Co-operation and Development [OECD], 2010, 2014a). TALIS 2013 used representative samples from 34 countries/regions (24 countries in 2008), involving more than 104,330 teachers from lower secondary education. Portugal participated in TALIS 2008, TALIS 2013, and TALIS 2018 (of which results were recently released). TALIS is the most important series of surveys approaching the "learning environment and the working conditions of teachers in schools" (OECD, 2014a, p. 19). TALIS 2013 focused on teachers' perceptions of schoolwork conditions, the feedback received from school principals, teachers' professional development, teachers' pedagogical practices, teachers' sense of self-efficacy, classroom disciplinary climate, and school-level policies and practices (namely, school leadership).

It is worth mentioning that a significant number of studies about teachers' job satisfaction, published before and after the TALIS 2013 study, were motivated by concerns about teacher turnover and teacher attrition (e.g., Hahs-Vaughn & Scherff, 2008; Henry et al., 2011; Skaalvik & Skaalvik, 2011). These concerns seem to continue to be high on the agenda of some education systems. Glazer (2018), for example, maintains that public school teaching in the US is a temporary job and that more teachers leave the profession voluntarily than those who remain until retirement. den Brok et al. (2017) also found that although attrition among novice teachers in the Netherlands is somewhat lower than in the United Kingdom, United States, or Australia, it is still close to 15%.

Teacher attrition and teacher turnover have been found to negatively affect student academic achievement, in part because teachers with higher qualifications are more likely to leave the profession (Clotfelter et al., 2007; Ronfeldt et al., 2013). However, not all educational systems share the same level of concern. In countries like the Republic of Moldova, Singapore, and Brazil, levels of attrition are low (UNESCO Institute for Statistics, 2017), although the reasons for this may differ. Sims (2017) analysed the TALIS 2013 data in England and concluded that job satisfaction is lower in England than in other English-speaking countries that participated in TALIS. Furthermore, English teachers are more likely to move from one school to another (although the difference is not significant). The quality of leadership and teacher cooperation seem particularly relevant factors for job satisfaction in English teachers.

In Portugal, Jesus (1996) and Jesus and Lens (2005) note that the majority of teachers would like to leave the profession. Flores (2014), using a sample of 3,000 teachers, found that the motivation of 61% of the participants had decreased since 2009, as well as their professional motivation. More than 95% of the participants also commented that the bureaucracy had increased as well as external control over their work. Participants also considered that the media and some political decisions were responsible for the lowered appreciation of the teaching profession. Although these data suggest that Portuguese teachers have low job satisfaction, the most recent data from the UNESCO Institute for Statistics (2017) show that the teacher attrition rate of Portuguese primary teachers was 8.2% in 2012, 10.2% in 2013, 7.2% in 2014, and only 1.9% in 2015. In addition, the TALIS 2013 data show that Portuguese teachers' job satisfaction ($M = 11.81$; as defined for this

particular study) is almost on the mean of TALIS participant countries ($M = 11.98$; the mid-score of the scale is 10). Moreover, if we consider “satisfaction with current work environment” (one of the dimensions of teacher job satisfaction in TALIS 2013, the other one being “satisfaction with the profession”), we find that Portugal ($M = 12.43$; eighth place in 34 countries) is somewhat above the mean of TALIS participating countries ($M = 12.11$).

In Portugal, there are almost no studies about teacher job satisfaction (and most studies that do exist use non-representative samples). This fact, coupled with the significant between-countries variability in factors involved in teacher job satisfaction, motivated us to explore the critical issue of teacher job satisfaction in Portuguese teachers using the data from TALIS 2013.

Teachers’ job satisfaction and associated factors

Generally, job satisfaction refers to how much a person enjoys the conditions in which they carry out their professional activity (Pepe et al., 2017). Both cognitive and affective features seem to be involved in the construct of job satisfaction. Job satisfaction stems from a positive perception about job conditions (Worrell et al., 2006): The individual perceives job conditions as rewarding and as fulfilling their personal goals, and this tends to increase their commitment to the job and the organisation.

Pepe et al. (2017) distinguish two main perspectives in the literature regarding job satisfaction: One perspective stresses the importance of personal factors for job satisfaction (e.g., cultural background, motivation for the profession, perception of student–teacher relations). Caprara et al. (2006), for example, found that teacher self-efficacy affects job satisfaction and student achievement, even when controlling for previous levels of achievement. Another perspective considers work and societal conditions (e.g., leadership style, salary, organisational equity) to be more important than personal factors for job satisfaction. Kwantes (2010), for instance, compared the equivalence of the construct job satisfaction in nine nations and concluded that national context differences explained 18.5% of the variance in job satisfaction.

Teacher job satisfaction: a multilevel (systemic) perspective

While researchers are naturally more interested in factors at any level that can explain most of the variance in job satisfaction, for most teachers, teacher job satisfaction will likely result from a unique combination of factors from different levels for a particular teacher (Skaalvik & Skaalvik, 2015). For example, accountability policies, which are widely recognised by researchers as an important systemic factor for teacher job satisfaction, teacher stress, and burnout, also put schools under pressure (Saeki et al., 2018; Sugrue & Mertkan, 2017; von der Embse et al., 2017). However, individual schools might deal differently with the pressure for academic results, consequently influencing their teachers in different ways. Finally, individual teachers, nested in specific schools, will likely perceive accountability according to individual predispositions and characteristics, and to the perceived organisational (school) reaction to accountability.

Although teachers’ job satisfaction may share some characteristics, worldwide, international studies like TALIS (OECD, 2010, 2014a) have found significant between-countries and between-schools variability. According to Kwantes (2010), the evidence suggests that

“... content areas of job satisfaction do not function equivalently across all cultural or national samples and, in fact, may not be perceived equally” (p. 148). In order to study teacher job satisfaction, it is, therefore, relevant to partition the variance of predictors across hierarchical levels and to specify the level of each predictor (Heck et al., 2010).

Although research about teacher job satisfaction is not typically designed in a multilevel perspective, there is a growing number of studies that explore the multilevel nature of predictors of teacher job satisfaction (e.g., Gil-Flores, 2017; Torres, 2018). K. Wang et al. (2019) examined data from United States TALIS 2013, using a multilevel regression and commonality analysis, and concluded that the percentage of low achievers in the classroom, classroom behaviour problems, classroom disciplinary climate, socioeconomic status (SES), school location, principal job satisfaction, school autonomy for instruction, participation among stakeholders, experience, teacher self-efficacy, teacher–student relationships, teacher cooperation, and effective professional development are all predictors of teacher job satisfaction. Of these, classroom disciplinary climate, participation among stakeholders, and teacher–student relationships are particularly significant predictors. Overall, the authors found that school and teacher factors were more relevant than student factors for teacher job satisfaction. Sun and Xia (2018) also used a multilevel structural equation modelling (SEM) strategy to analyse TALIS 2013 data from the United States. The authors found that distributed leadership is a significant predictor of teacher job satisfaction and that this relationship is partly mediated by teacher self-efficacy at both teacher and school levels.

Importantly, Zieger et al. (2019) stress that the organisers of the TALIS study themselves did not meet scalar invariance when they compared the results of the scales across countries. Consequently, the technical report of TALIS 2013 (OECD, 2014b) warns against the comparison of the scale scores across countries. Zieger et al. suggest that creating a scale for a single country and then using standard measurement invariance approaches to set the comparator nations would be an appropriate way to overcome comparability issues. Zieger et al. state, for instance, that the comparison between England and Portugal in TALIS scales is unreliable (because of problems with fit indices of scale invariance) but add that England is comparable with 13 other countries.

Extra-school factors

Some important factors, external to schools, such as educational policies, teachers’ salaries, and professional prestige, have been associated with teacher job satisfaction (Ellison et al., 2018; Han et al., 2018; Lincove et al., 2015; Tuytens & Devos, 2018). At present, teacher and school accountability for student performance are considered to be important factors in teacher job (in)satisfaction, stress, and attrition (Cochran-Smith et al., 2017; Ryan et al., 2017; von der Embse et al., 2016). Ingersoll and Collins (2017) contend that the teacher accountability movement is one of the most controversial and significant contemporary education reforms. According to these authors, in the US, the teacher accountability movement blames teachers for “the erosion of American economic competitiveness, the decline in student academic achievement, teenage pregnancy, juvenile delinquency, a decline in morals, gender and racial stereotyping and discrimination, and on and on” (p. 75). Still, accountability may be perceived differently in educational systems where school performance has implications in state financing, in comparison with educational systems where financing has no direct connection with school performance.

School-level factors

Research on school-level factors that influence teacher job satisfaction has explored such variables as school size, class size, school leadership, school climate, school SES, and teacher autonomy (Dou et al., 2017; Giambona & Porcu, 2018; Watson et al., 2017). Generally, research has found that school processes do make a difference for teacher job satisfaction, particularly career and working conditions, staff collegiality, administrative support, school SES, school climate, and student behaviour (Aldridge & Fraser, 2016; Ghavifekr & Pillai, 2016; Shen et al., 2012). The quality of relations of teachers with their colleagues and with students is also associated with higher levels of job satisfaction.

Teacher-level factors

The influence of demographic variables such as gender and teaching experience on teacher job satisfaction is unclear. Some studies report no significant relationship, while others report somewhat higher levels of satisfaction in female teachers and younger teachers (Aytac, 2015; Menon & Athanasoula-Reppa, 2011).

Teacher self-efficacy has been reported as positively related to teacher job satisfaction (Klassen & Chiu, 2010; H. Wang et al., 2015). Malinen and Savolainen (2016) found that teacher self-efficacy in managing behaviour had a positive effect on job satisfaction and a negative effect on burnout. Caprara et al. (2006) also found that perceived self-efficacy had a positive effect on teachers' ability to handle effectively various professional tasks, obligations, and challenges.

Another important and pervasive factor involved in teacher job satisfaction that can still significantly vary between countries, regions, schools, and classrooms (i.e., from teacher to teacher) is classroom disruption (Chiu & Chow, 2011; Hecker et al., 2018). Classroom disruption is often referred to as a significant reason for teachers' emotional exhaustion (Carson et al., 2011), as a vital classroom stressor (Tsouloupas et al., 2014), and as time and energy consuming (Brouwers & Tomic, 2000; Lopes & Oliveira, 2017). According to Simón and Alonso-Tapia (2016), classroom disruption is one of the most frequent and harmful problems faced by teachers.

Summing up the literature on teacher job satisfaction, Pepe et al. (2017) state that "job satisfaction in teaching is derived from the gratification of higher-order needs such as positive social relationships, rather than lower-order needs (e.g., pay incentives)" and that "satisfaction with positive relationships with co-workers, parents, and students mitigates some of the adverse effects of teaching work" (p. 399).

Our study aims to explore the school-related and the teacher-related factors involved in teacher job satisfaction, using data from TALIS 2013 (OECD, 2014a). The following hypotheses guide this study:

- (1) There is significant between-schools variation in teacher job satisfaction.
- (2) Both school-related and teacher-related variables are involved in teacher job satisfaction, but teacher-related factors influence teacher job satisfaction more than school-related factors.
- (3) Interpersonal relations are important factors for teacher job satisfaction.

Having these hypotheses in mind, as well as the relevant literature about teacher job satisfaction, we tested the involvement of different variables in job satisfaction through

multilevel analysis. At Level 1 (teacher level), teacher's age, gender, self-efficacy, and classroom disciplinary climate were considered as predictors of job satisfaction. At Level 2 (school level), school climate, the degree of distributed leadership, teacher–student relations, teacher cooperation, and the number of teachers in the school (school size) were hypothesised as predictors of job satisfaction.

Method

The present study used data from TALIS 2013. Two questionnaires were used to collect data: one questionnaire for school principals (to collect organisational data) and one questionnaire for teachers. The schools for this study are at the ISCED-2 level (International Standard Classification of Education). In Portugal, ISCED-2 corresponds to seventh-through ninth-grade classes.

Participants

As described in the TALIS 2013 technical report (OECD, 2014b), Portuguese participants were recruited through a stratified two-stage probability sampling design. The target population is 1,318 schools and 46,088 teachers. However, 16 schools, with 258 teachers, were excluded because they had non-Portuguese curricula. The coverage of the target population is, therefore, 98.8% for schools and 99.4% for teachers.

In the first stage of the sampling procedure, 192 schools from all over the country were randomly selected through a probability proportional to size (PPS). Three thousand, eight hundred and eight teachers responded to the surveys, representing 94.4% school participation. The weighted estimated size of the teacher population for this sample is 44,494. In the second stage of the sampling procedure, 20 teachers from each school were randomly selected and invited to participate in the survey. The teacher involvement in participating schools was 91.7%. Since we used school data and teacher data in the context of multilevel analysis, the International Database Analyzer from the International Association for the Evaluation of Educational Achievement Analyzer (IEA IDB Analyzer) allowed us to merge school and teacher files and to select the appropriate weight variables. The IDB Analyzer “is a stand-alone software originally developed by the IEA Data Processing and Research Center (IEA DPC) for the use in IEA's large-scale surveys” (Becker et al., 2014, p. 28). Moreover, it is straightforward in the analysis of combined school data and teacher data.

After accounting for missing data, the Portuguese sample included 177 schools (161 public, 16 private) and 3,489 teachers (2,563 female, 926 male). The average number of teachers per school was 125.05 ($SD = 61.28$; Min = 15; Max = 380). However, there were differences in the number of teachers between public ($M = 131.31$, $SD = 60.99$) and private ($M = 69.10$, $SD = 34.55$) schools. The average age of teachers was 44.81 years ($SD = 7.50$; Min = 15; Max = 68).

Variables and measures

We extracted two types of variables from the TALIS 2013 database: single variables obtained from responses to specific questions and latent continuous variables obtained

from a confirmatory factor analysis (CFA) to a set of responses. In this last case, the latent variable is the combination of several observed variables. Classroom climate, for example, results from the combination of four observed variables (quiet classroom, pleasant atmosphere, disruptive noise, and interrupted lesson). After computation, the factor scores were rescaled to a metric of convenience, with a standard deviation of 2.0, where the value of 10 corresponds to the mid-point of the scale in which the items were originally measured (i.e., 2.5 points). Therefore, a result of 10 indicates average agreement with the items in the scale. A result above 10 indicates some agreement, and a result below 10 indicates some disagreement. The TALIS 2013 technical report (OECD, 2014b) provides complete information about the construction of the scales and indices developed through CFA.

Job satisfaction

Job satisfaction is the outcome variable for this study. In TALIS 2013, job satisfaction results from the combination of two indicators: satisfaction with current work environment (e.g., “All in all, I am satisfied with my job”; Cronbach’s $\alpha = .77$; composite reliability [CR] = 0.61; average variance extracted [AVE] = .85), and satisfaction with profession (e.g., “The advantages of being a teacher clearly outweigh the disadvantages”; Cronbach’s $\alpha = .86$; CR = .91; AVE = .71). The correlation between satisfaction with current work environment and satisfaction with profession is $r(3192) = .47, p < .01$. On the whole, job satisfaction results from the responses to eight items (Cronbach’s $\alpha = .82$), four from satisfaction with the current work environment, and four from satisfaction with the profession. All items in the scale were answered on a 4-point scale, where 1 corresponds to *strongly disagree* and 4 to *strongly agree*. The CR for the eight items is .87, and the AVE is .46. According to the transformation resulting from CFA, a result above 10 indicates some agreement with the item, and a result below 10 indicates some disagreement with the item.

Teacher-related predictors

In addition to teachers’ age and gender, the following variables were considered as predictors of teacher job satisfaction at the teacher level.

Teacher self-efficacy. Teachers self-efficacy (TSE) refers to the perceived ability of the teacher to achieve classroom instructional and behavioural goals (Cronbach’s $\alpha = .77$; CR = 0.90; AVE = .57). This variable is the average of three distinct features of TSE: efficacy in classroom management (e.g., “Get students to follow classroom rules”; Cronbach’s $\alpha = .81$; CR = 0.64; AVE = .87), efficacy in instruction (e.g., “Craft good questions for my students”; Cronbach’s $\alpha = .75$; CR = 0.84; AVE = .57), and efficacy in student engagement (e.g., “Help my students value learning”; Cronbach’s $\alpha = .76$; CR = 0.85; AVE = .59). Responses must be given on a scale ranging from *strongly disagree* (1) to *strongly agree* (4).

Classroom disciplinary climate. Classroom disciplinary climate refers to the teacher’s perceived ability to control classroom order and/or classroom disruption. The variable was designed through a CFA (Cronbach’s $\alpha = .88$; CR = 0.92; AVE = .74), taking into account the answers to four items (e.g., “There is much disruptive noise in this classroom”), ranging from *never* (1) to *once a week or more* (6). As referred in the TALIS technical report (OECD, 2014b), three items “were reverse coded due to their negative statement

about classroom disciplinary climate and to ensure they had the same direction as the rest of the items" (p. 229).

School-related predictors

In addition to the number of teachers at the school, four other indicators, resulting from answers to the TALIS scales, were considered at the school level.

Teacher cooperation. Teacher cooperation refers to the perceived cooperation between teachers to effectively undertake student instruction. Teacher cooperation was measured by eight items (Cronbach's $\alpha = .65$; CR = 0.80; AVE = .35) that were composed from two scales: exchange and coordination for teaching (e.g., "Exchange teaching materials with colleagues"; Cronbach's $\alpha = .74$; CR = 0.84; AVE = .56) and professional collaboration (e.g., "Teach jointly as a team in the same class"; Cronbach's $\alpha = .56$; CR = 0.75; AVE = .43).

School climate. School climate refers both to the perceived level of aggression and intimidation in the school and to the respect between staff members and between staff members and students (Cronbach's $\alpha = .79$; CR = 0.83; AVE = .39). Two scales were formed separately to represent school climate: school delinquency and violence (e.g., "Vandalism and theft"; Cronbach's $\alpha = .84$; CR = 0.79; AVE = .53) and mutual respect (e.g., "The relationships between teachers and students are good"; Cronbach's $\alpha = .74$; CR = 0.81; AVE = .53). Each scale has four items; these were collected from the school principals.

Distributed leadership. Distributed leadership measures school principals' perception of how they share power with their staff and whether parents and students are permitted to participate in school decision making. Distributed leadership was measured by three items (e.g., "This school provides staff with opportunities to actively participate in school decisions"; Cronbach's $\alpha = .78$; CR = 0.85; AVE = .60).

Teacher–student relations. A Level 2 (school) measure was created by aggregating individual teachers' perceived teacher–student relations (previously described) within each school. This variable, therefore, represents the within-school mean for teacher–student relations. The variable seeks to measure the relations between teachers and students in a specific school. Four items measured teacher–student relations (e.g., "In this school, teachers and students usually get on well with each other"; "If a student from this school needs extra assistance, the school provides it"; Cronbach's $\alpha = .73$; CR = 0.85; AVE = .66).

Model building

The model building followed several steps. The first step was to create a null or unconditional model (one-way analysis of variance random effects model with no Level 1 or Level 2 predictors) to ascertain whether there is between-school variation in teacher job satisfaction. This first step addresses the question "Is there a (Level 2) school effect on the (Level 1) intercept of teacher job satisfaction, which represents the mean score?", and involves the calculation of the intraclass correlation coefficient (ICC) of the deviance statistic ($-2LL$) and the design effect. In the second step, a random coefficient model was added to test for significant relationships between Level 1 predictors and job satisfaction and to test for differences between schools in each predictor. Finally, a third model,

combining Level 1 and Level 2 variables, tested the relevance of both levels variables in the prediction of job satisfaction. The model incorporates predictors both at Level 1 and Level 2, and both the Level 1 intercept and the Level 1 slopes are predicted as random effects. Level 1 predictors were group-centred, and Level 2 predictors were grand-mean centred in the partially and fully conditional models. HLM 7 hierarchical linear and nonlinear modelling (Raudenbush et al., 2013) were used for the adjustment of models.

Results

Tables 1 and 2 show the descriptive statistics for teachers and for schools and the correlations between variables.

The descriptive statistics show that: (a) Portuguese teachers' job satisfaction is above the mid-point of the scale (10); (b) Portuguese teachers are somewhat older than the average of TALIS teachers ($M = 42.51$); (c) Portuguese teachers are positive about their relations with the students and about their ability to conduct classroom instruction and management; (d) although positive, teacher perception about classroom discipline is below the mean of other teacher-related variables; (e) school-level variables also show positive trends except for teacher cooperation that is just above the mid-point of the scale.

Unconditional model

Table 3 shows the correlations between school variables, and Table 4 shows the results for the unconditional or null model (the denomination comes from the fact that no predictors are included in the model). The goal of this model is to test whether there is between-school variation in job satisfaction. The model is the following:

Table 1. Descriptive statistics for teachers ($N = 3,489$; 2,563 female, 926 male).

	<i>M</i>	<i>SD</i>	Min	Max
Job Satisfaction	11.81	1.83	4.48	15.03
Age	44.81	7.50	24	68
Self-efficacy	13.76	1.31	8.06	15.45
Class discipline	10.50	1.96	5.57	14.36
Descriptive statistics for schools ($N = 177$; 161 public, 16 private)				
School climate	12.85	1.70	8.24	16.75
Distributed leadership	12.67	1.77	8.89	16.54
Teacher cooperation	10.03	1.52	6.20	14.61
Teacher–Student relations_mean.	13.47	.66	11.14	15.58
Number_Teachers	125	61.70	15	380

Table 2. Correlations between teacher variables.

	1	2	3	4	5
Job Satisfaction	–				
Age	.044**	–			
Self-efficacy	.257**	.003			
Class discipline	.262**	–.055**	.227**	–	

** $p < 0.01$.

Table 3. Correlations between school variables.

	1	2	3	4	5
School climate	–				
Distributed leadership	.122**	–			
Teacher cooperation	.056**	.012	–		
Teacher–Student relations_mean	.320**	.064**	.107**	–	
Number_Teachers	.001	.035**	–.006	–.183**	–

** $p < 0.01$.

Table 4. Unconditional hierarchical linear model.

Estimated fixed effects					
Parameter	Coefficient	SE	df	t	p
Intercept	11.80	0.04	176	247.21	0.000
Estimated random effects					
Parameter	SD	VC	df	χ^2	p
u_0 (variation among schools)	0.49	0.24	176	445.48	0.000
r (variation within schools)	1.77	3.12			

Note: VC = variance component.

Level 1 Model

$$\text{JobSats} = \beta_{0j} + r_{ij}$$

Level 2 Model

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

In this model, β_{0j} represents the Level 1 intercept term, which is a function of an intercept term at Level 2 (γ_{00}) and of a Level 1 residual term (r_{ij}). The Level 1 intercept term (β_{0j}) is a function of the grand mean (γ_{00}) of schools, plus a random term (u_{0j}), which means that the intercept is modelled as a random effect.

The null or unconditional model shows an average of 11.80 for teacher job satisfaction, 1.80 points above the mid-point of the scale. Within-school variance for teacher job satisfaction is $\sigma^2 = 3.12$, and between-school variance is $\tau = 0.24$, $p < 0.001$. The intraclass correlation is 0.07 ($0.24/[3.12 + 0.24]$), which means that differences between schools explain 7% of the variability in teacher job satisfaction, and differences between individual teachers explain 93%. The significant between-schools variation for job satisfaction shows that there is still considerable residual variation in job satisfaction yet to be explained and that a model with additional predictors is needed. The design effect¹ (Design Effect = $1 + [nc - 1]ICC$) is 2.35. According to some authors (e.g., Muthén & Satorra, 1995), a design effect greater than 2.0 indicates the need for hierarchical linear modelling.

Hierarchical linear modelling combining teacher-level and school-level predictors of job satisfaction

Once it was determined that job satisfaction significantly varies between schools, the next step was to build a model including both Level 1 and Level 2 predictors of job satisfaction. Before running the complete model, hypothesised predictors were individually entered into the Level 1 regression equation to test their importance as predictors. This process

revealed that teachers' age and gender did not contribute to the explanation of job satisfaction at Level 1 and that the number of teachers at the school, the mean teacher–student relations, and distributed leadership did not contribute to the model at Level 2. We, therefore, decided to exclude those variables from the model. The complete model included teacher self-efficacy and classroom discipline as teacher-level predictors of job satisfaction, and the type of school (public/private), school climate, and teacher cooperation as school-level predictors of job satisfaction (see Table 5). The model is as follows:

Level 1 Model

$$\text{JobSats} = \beta_0 + \beta_1 * (\text{Self_Eff.}) + \beta_2 * (\text{Clas_Dis}) + r$$

Level 2 Model

$$\beta_0 = \gamma_{00} + \gamma_{01} * (\text{PubPriv}) + \gamma_{02} * (\text{SchoolClim}) + \gamma_{03} * (\text{Teach_Coop}) + u_0$$

$$\beta_1 = \gamma_{10}$$

$$\beta_2 = \gamma_{20}$$

The results show that: (a) every variable retained in the final model is a significant predictor of teacher job satisfaction; (b) teacher-level variables are better predictors of job satisfaction than school-level variables, except for the characteristic public/private; (c) type of school is the best single predictor of job satisfaction (job satisfaction is 0.83 higher in private schools); (d) at the teacher level, perceived teacher–student relations is the best predictor of job satisfaction.

The unexplained variance among schools in the final model is $u_{0j} = 0.17$, which represents a 29.17% reduction compared to the null model ($u_{0j} = 0.24$). Still, a significant portion of the variance remains unexplained by the model. There was a significant increase in model fit from the unconditional model (deviance = 14042.00) to the complete model (deviance = 13437.92), represented by a significant decrease in the deviance of the model ($14042.00 - 13437.92 = 604.08$, $p < .001$).

Table 5. Hierarchical linear model for job satisfaction with teacher-level and school level predictors.

Estimated fixed effects					
Parameter	Coefficient	SE	df	t	p
Intercept	10.89	0.20	173	53.58	0.000
Public/private	0.83	0.19	173	4.40	0.000
School climate	0.08	0.026	173	3.01	0.003
Teacher cooperation	0.06	0.02	173	2.22	0.028
Teacher self-efficacy	0.22	0.02	3309	9.33	0.000
Classroom discipline	0.18	0.02	3309	10.81	0.000
Estimated random effects					
Parameter	SD	VC	df	χ^2	p
u_0 (variation among schools)	0.42	0.17	173	339.67	0.000
r (variation within schools)	1.62	2.62			

Note: VC = variance component.

Discussion

Three primary hypotheses guided our study: (1) There is significant between-schools variation in teacher job satisfaction; (2) both school-related and teacher-related variables explain teacher job satisfaction, but teacher-related factors influence teacher job satisfaction more than school-related factors; (3) interpersonal relations are important factors for teacher job satisfaction.

The results show that there is significant between-school variation in job satisfaction. However, differences between schools represent no more than 7% of the explained variance in job satisfaction. In a study conducted in Spain, Gil-Flores (2017) found that 11.29% of the variance in job satisfaction corresponded to variability between schools and 88.71% to variability between teachers. This finding suggests that proximal variables, rather than distal variables, more fully explain job satisfaction. Still, we must stress that in our final model, a significant portion of the variance in job satisfaction remains unexplained. We can, therefore, hypothesise that other school-level variables, not considered in our model, explain significant variability in teacher job satisfaction. It seems unlikely, however, that the relative weight of teacher and school variables in job satisfaction would change significantly with the introduction of new variables. Still, it is important to note that the low autonomy of Portuguese public schools may explain the somewhat low between-school variability in job satisfaction. Public schools have no financial autonomy; principals cannot hire teachers; the disciplinary regulations are set by law, etc. Unlike in other countries, salary may contribute to job satisfaction, but this will not have great explanatory power because it is the same for every school. In this context, it is not surprising that the difference between schools in job satisfaction is moderate.

The difference in job satisfaction between private and public schools is significant. Although teachers from private and public schools are moderately satisfied, teachers from private schools ($M = 12.67$, $SD = 1.74$, $n = 16$) are more satisfied than teachers from public schools ($M = 11.72$, $SD = 1.82$, $n = 161$), $t = -8.54$, $p < .001$). This difference may reflect the greater autonomy of private schools. For instance, private schools can select their students and teachers, and they can set their disciplinary regulations. Also, private schools that participated in TALIS 2013 are much smaller ($M = 69$ teachers) than public schools ($M = 131$ teachers).

Analysing the variables retained in the final model, it seems that the best predictors of job satisfaction involve proximal interpersonal relationships, specifically, relations with the students. For instance, teacher self-efficacy and classroom discipline (teacher-level variables) better predict job satisfaction than teacher cooperation. As Pepe et al. (2017) state, “job satisfaction in teaching is derived from the gratification of higher-order needs such as positive social relationships, rather than lower-order needs (e.g., pay incentives)” and “satisfaction with positive relationships with co-workers, parents, and students mitigates some of the adverse effects of teaching work” (p. 399).

At the school level, other than for the variable public/private, the school climate predicts job satisfaction, although weakly. Past research suggests that school climate positively influences teacher job satisfaction (Aldridge & Fraser, 2016; Ghavifekr & Pillai, 2016) and commitment to the organisation (Sezgin, 2010). Malinen and Savolainen (2016) also found that the school climate has a positive effect on job satisfaction and burnout, partly mediated by self-efficacy. Overall, most studies, including our own, have

found a positive relationship between school climate and job satisfaction. Fluctuations in the strength of the relation may reflect differences in the definition and the measurement of the school climate.

The results also show that teacher cooperation predicts job satisfaction minimally. Drossel et al. (2019) state that teacher cooperation is an important indicator of school quality, reducing teacher stress and improving student academic achievement, and contend that “the subjective value component, in particular, personal relevance, is the decisive factor in determining why teachers cooperate in teaching-related forms of cooperation” (p. 9). Our participants anticipated very moderate personal gains from teacher cooperation, suggesting that they did not perceive teacher cooperation as very relevant for job satisfaction.

At the teacher level, we found two significant predictors of job satisfaction: classroom discipline and teacher self-efficacy. The predictive value of these factors suggests that interpersonal relations matter for job satisfaction. The literature often refers to classroom misbehaviour as one of the most severe problems that teachers face in schools (Simón & Alonso-Tapia, 2016), and has long emphasised that classroom misbehaviour is time and energy consuming and increases the risk for teacher burnout (Brophy, 1996; Lewis et al., 2005). Classroom misbehaviour may also harm teacher–student relations and reduce teachers’ sense of professional wellbeing (Carson et al., 2011). The results we obtained about teacher efficacy are unsurprising since the literature has been conclusive about the importance of teacher self-efficacy for job satisfaction (e.g., Caprara et al., 2006; H. Wang et al., 2015).

It is important to note that teachers’ age, gender, the number of teachers in the school (school size), teacher–student relations (at the school level), and the extent of distributed leadership did not help to explain job satisfaction. In our study, most participants have a long experience in teaching, and this may have reduced the variability of the results. The research on teacher gender and job satisfaction tends to be inconclusive. According to Aytac (2015), female teachers may be more satisfied because teaching is usually perceived as a female profession. However, male teachers can be precisely those people that choose to become teachers, therefore balancing perceptions that could be more negative. The findings concerning school size reinforce findings in the literature that teachers might be more concerned about class size than school size (Biggs, 1998; Pedder, 2006; Watson et al., 2017).

Distributed leadership, contrary to what was found in Singapore (Torres, 2018) but similar to what was found in Spain (Gil-Flores, 2017), did not predict job satisfaction in our study. Most likely, the structure of the educational systems may be an important reason for discrepancies. In Portugal, the central government largely determines the governance of the schools. School principals have limited autonomy, so they cannot easily share leadership. The limited autonomy may explain why distributed leadership was not an influential factor in our study.

Overall, our results seem to confirm the position of Pepe et al. (2017) that teacher job satisfaction has much to do with higher order needs, specifically, positive social relations. Although principals of public schools, in Portugal, cannot determine or influence teachers’ professional careers, they may still perceive the development of positive relations in the classroom (more than in the school, as a whole) as an effective way to increase teacher job satisfaction and, consequently, to contribute to student academic achievement and

educational growth. The results also suggest that job satisfaction is more dependent upon classroom processes and only then (and in a more diffuse way) to broader school processes.

Finally, the results suggest that the most important predictors of job satisfaction of Portuguese teachers (classroom disciplinary climate and teacher self-efficacy) are similar to predictors found in other countries that participated in TALIS 2013. However, school-level factors like the quality of leadership or teacher cooperation do not explain Portuguese teachers' job satisfaction, as was the case for other TALIS 2013 participating countries (e.g., U.S., England). Some idiosyncrasies of the Portuguese educational system (e.g., low autonomy of school principals and teachers) may help explain these findings.

Limitations and implications for practice

The main limitation of this study is that it can deal only with the variables that are included in the TALIS 2013 database. It would be interesting to consider other variables that might be involved in teacher job satisfaction, such as student academic achievement or the perceived social status of the profession. The omission of these explanatory variables may raise endogeneity problems (Roberts & Whited, 2013). Despite the absence of some potentially relevant variables in the model, our dependent variable (job satisfaction) may be influenced by one or several explanatory variables. Abdallah et al. (2015) stress that endogeneity "would result in the error term being correlated with the explanatory variables, thereby violating a basic assumption behind ordinary least squares (OLS) regression analysis" (p. 791).

Our results seem to confirm suggestions in the literature that actions to improve teacher job satisfaction should focus on classrooms, in particular, teacher–student relationships. Assisting teachers with classroom instruction and management may be effective ways to increase teacher effectiveness, perceived self-efficacy, and job satisfaction, and consequently, improve student learning and well-being.

Note

1. "The design effect quantifies the effect of independence violations on standard error estimates and is an estimate of the multiplier that needs to be applied to standard errors to correct for the negative bias that results from nested data." (Peugh, 2010, p. 91)

Disclosure statement

No potential conflict of interest was reported by the authors.

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