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# Teachers' job satisfaction and gender imbalance at school

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## ABSTRACT

The paper aims to evaluate and compare across a large range of countries the impact of gender diversity on the overall job satisfaction of lower- secondary education teachers. It also seeks to examine whether the effects of gender similarity are asymmetrical for men and women. The empirical evidence is based on the estimation of multilevel models that control for individual characteristics, work-related factors, and school- based variables. The results may be suggestive for policy makers and educational planners who are initiating interventions designed to promote diversity within the education system and to remasculinize the teaching profession

## 1. Introduction

Worldwide, women currently hold around 66 and 57 percent of the teaching jobs in primary and lower-secondary education, respectively (UIS 2019). In high-income countries, these percentages are much higher, amounting to about 82 and 65 percent, respectively. The transformation of teaching into female work began many decades ago. In several countries, women's preponderance in the education sector was already evident early in the expansion of the schooling system (see, for example, Cortina and San Roman 2006; Kelleher 2011). In the absence of any policy intervention designed to redress the gender imbalance in favor of women, the tendency toward the feminization of the teaching profession is likely to continue in many countries, with a non-null risk of reducing the number of male teachers to zero. To illustrate, McGrath and Van Bergen (2017) predict that male primary teachers in Australia could reach an 'extinction point' in approximately 40 years. In several countries, the increasing feminization of the teaching profession is a policy concern (see OECD 2019).

The reasons why the teaching profession became gender imbalanced in favor of women have been documented extensively in the literature (see, for example, Boyle 2004; Kelleher 2011; Mills, Martino, and Lingard 2004; Weiler 1989). They include the low salary and prestige of the teaching profession, the association of teaching with skills that the society normally attributes to women, and family and peer pressures that affect the career choice of male and female students. Apart from this, a large body of research has focused on the impacts that gender imbalance in the

teaching workforce may have on students. Based on role model theories, this stream of research has examined whether the preponderance of women teachers produces more negative attitudes among boys (see, for example, Carrington, Tymms, and Merrell 2008; De Zeeuw et al. 2014; Spilt, Koomen, and Jak 2012) and evaluated whether the feminization of the teaching profession is detrimental to boy's academic performance (see, for example, Cho 2012; Lam et al. 2010; Winters et al. 2013).

This paper adds to this literature on the effects of gender imbalance in the teaching profession. Its aims are twofold: first, to evaluate and compare across a large range of countries the impacts of the gender composition of the teaching staff on the job satisfaction of lower-secondary teachers; second, to estimate these effects by gender and to check whether they are asymmetric for men and women. The results are based on international data from the 2018 Teaching and Learning International Survey (TALIS), conducted under the auspices of the Organization for Economic Co-operation and Development (OECD) in 46 countries (see OECD 2018). To our knowledge, this paper is the first study in the literature to examine on an international basis the relationships between gender diversity and teacher's job satisfaction in lower-secondary schools. Occupational psychologists and organizational specialists have conducted a limited but growing number of studies on the links between workplace gender composition and employee's satisfaction at work (see, for example, Haile 2012; Nielsen and Madsen 2017; Peccei and Lee 2005; see also Tolbert, Graham, and Andrews 1999 and Williams and O'Reilly 1998, for a review of past research). However, these research studies focus mainly on workers in the industrial sector, and their conclusions are not systematically transferable to other professions and, in particular, to the teaching profession. In this regard, this paper makes a new contribution to this field, but it also contributes to the growing literature on teacher job satisfaction. In identifying gender diversity at school as a possible source of job satisfaction, the results may be suggestive for policy makers and educational planners in initiating interventions designed to attract and retain men in the teaching profession.

The remainder of the paper proceeds as follows. Section 2 offers a brief review of the literature, Section 3 describes the data, Section 4 details the analytical framework, Section 5 presents the empirical results, and Section 6 summarizes the main findings and conclusions.

## 2. Review of the literature

The dramatic change in women's labor force participation that occurred over the past 50 years in most countries has motivated interest in evaluating the impact of gender diversity and gender composition in the workplace on a wide range of organizational outcomes, such as performance in the firm, employee satisfaction, turnover, or burnout. Two clusters of theories have been used extensively to understand the relationships between differing degrees of diversity and outcomes: the similarity/ attraction perspective and the social contact perspective.<sup>1</sup> Although both are plausible explanations, these theories provide contradictory predictions for the impacts of diversity and workgroup composition.

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<sup>1</sup> The group competition perspective – chiefly elaborated by Blalock (1967) for analyzing community race relations– was also used, although less frequently, to test the effect of workplace gender similarity on employees' work attitudes.

For the similarity/attraction perspective (see, for example, Berscheid and Reis 1998; Byrne 1971), people in general are more attracted to and feel more comfortable with others who are similar to themselves. Accordingly, a high degree of diversity in a work team will lead to miscommunication, disorganization and lack of cohesion, employee conflict, frustration, and dissatisfaction, which will, in turn, lead to weaker performance.

In contrast to the similarity/attraction theory, the social contact perspective, which is based on the contributions of Blau (1977) and Kanter (1977), focuses on how membership in the majority or minority group affects individuals' attitudes and behaviors. For Kanter (1977), majorities in skewed groups<sup>2</sup> tend to polarize or exaggerate the differences between themselves and tokens and to perceive minorities in distorted ways. They thus tend to promote interactions among their members and to minimize their contacts with minority members. As a consequence, minority members are more likely to experience greater social isolation, extreme performance pressure on the job, and strong social constraints. Although Blau's (1977) theory focuses on a different explanatory scheme, it leads to similar overall predictions. This strand of the social contact perspective rests on the premise that the greater the heterogeneity in a population, the greater the chances of social contacts between members of dissimilar characteristics. In skewed work settings, majority members have fewer out-group contacts and thus are more likely to engage in discriminatory behavior against minority members. As the minority group increases, the amount of out-group contacts among the majority increases, thus alleviating the negative consequences of discrimination for the minority. When applied to gender relations, the predictions of Blau's theory are gender-neutral, as are the predictions of Kanter's theory and the similarity/attraction perspective.

Based on these theoretical frameworks, a small but growing empirical literature has explored the link between job satisfaction and gender diversity and has tested for nonsymmetrical effects of dissimilarity for men and women. This empirical body of research has produced mixed results and provided only mixed support for the various theoretical frameworks presented above.

Among studies that reported results for men and women together, Konrad, Winter, and Gutek (1992) and Peccei and Lee (2005) found no significant impact of gender diversity on job satisfaction of workers. In contrast, and in accordance with the predictions of the social contact perspective, Allmendinger and Hackman (1995), Ellison and Mullin (2014), Haile (2012), and Tsui, Egan, and O'Reilly (1992) showed that the higher the gender diversity in the workplace, the lower the satisfaction level of employees.

The empirical literature is also mixed regarding the impact of gender diversity and gender composition on the job satisfaction of men and women considered separately.

To illustrate, Nielsen and Madsen (2017), and Peccei and Lee (2005) found no significant relationship between women's job satisfaction and workplace gender diversity. In line with Kanter's theory, Burke and McKeen (1996) and Martin and Harkreader (1993) showed that women working in predominantly male organizations are less satisfied than their peers. In contrast, Allmendinger and Hackman (1995), Smith, Smits, and Hoy (1998), Tsui, Egan, and O'Reilly (1992), and Wharton and Baron (1987) found that women in balanced- or female-

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<sup>2</sup> Kanter (1977) defines a skewed group as a group containing a large preponderance of one type (the numerical dominants or the numerical majority group) over another (the tokens or the numerical minority group).

dominated settings are less job satisfied than women in predominantly male settings. The empirical literature has found various reasons for why women are sometimes more satisfied in predominantly male settings. For example, South et al. (1982) found that women in minority positions have more opportunities to interact with and receive support from their male peers. Other studies (see, for example, Boraas and Rodgers III 2003; Johnson and Solon 1986) have shown that, after controlling for workers' characteristics, women in predominantly male occupations and workplaces earn significantly more than their counterparts in female-dominated occupations. This wage premium could translate into higher levels of satisfaction and could also result in lower turnover rates among these female employees (see, for example, Bygren 2010).

Among studies that reported results for men, Haile (2012) and Nielsen and Madsen (2017) found no significant relationship between men's job satisfaction and workplace gender diversity. In accordance with the predictions of the social contact perspective, Fields and Blum (1997) observed that men in gender-balanced settings were more satisfied than their counterparts in male- or female-dominated workgroups. In line with the similarity/attraction perspective, Allmendinger and Hackman (1995) and Peccei and Lee (2005) found reverse evidence. In contrast, Martin and Harkreader (1993), and Wharton and Baron (1991) found that men's job satisfaction is higher when they work in organizations with higher proportions of women or when there are more women in their job ladder. The reasons why men in minority positions are sometimes found to be more job satisfied are at least threefold. First, several studies have shown that sexist stereotyping is generally lower in female-dominated work settings and that men in the minority are not more socially isolated than their peers (see, for example, Konrad, Winter, and Gutek 1992; Snaveley and Fairhurst 1984; Williams and O'Reilly 1998). As a consequence, token men may be more likely to report higher job satisfaction. Second, men in minority positions may be more likely to compare themselves to women. Because women often benefit less than men from jobs, token men tend to evaluate their situation more positively than men in organizations with a larger concentration of male workers. Third, men may expect greater and faster opportunities for promotion when they work in organizations with higher proportions of women<sup>3</sup> (see, for example, Torre 2018; Williams 1992). Unlike women employed in male-dominated settings, they can perceive their token status as an advantage and can extract more satisfaction from their job.

Although comparison of the research reviewed here is instructive, the results are difficult to generalize because the studies differ greatly in population characteristics. The bulk of the research has been conducted on a wide variety of professions and industries<sup>4</sup> – including very specific occupations or sectors of the economy, such as workers in military depots (Martin and Harkreader 1993), players in symphony orchestras (Allmendinger and Hackman 1995), and employees in nonprofit organizations or in small business settings (Smith, Smits, and Hoy 1998). However, none of the studies reviewed above have focused on the teaching profession per se. As noted by Bank (2009, 298), 'There are so many differences between the occupations that have been studied that it is difficult to separate out the effects of tokenism and of gender from the

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<sup>3</sup> This is the glass escalator effect: men entering women's work expect to reach the top of the hierarchy faster than their female co-workers (see Williams 1992).

<sup>4</sup> The research in this area was based, with very few exceptions, on US data.

effects of other occupational characteristics.’ In this regard, the teaching profession has at least three characteristics that differentiate it from many other occupations: a) it is a sex-atypical occupation, at least at the primary and lower-secondary education levels; b) in many countries, the supervision and control of teachers are mainly in the hands of male supervising teachers, male principals, and male district officers; and c) unlike many professions, teacher’s age-earnings profiles are relatively flat.

We are only aware of three studies that have investigated the impact of men’s isolation in the teaching profession.<sup>5</sup> Based on a large sample of elementary and secondary school teachers conducted in the United States, Cognard-Black (2004) has shown that, despite their token status, male teachers are not more likely than women to leave the teaching profession. Instead, they are significantly more likely to be promoted internally to the position of school principal or to other leadership positions either in the school or in the administration of the schooling system. Dworkin, Chafetz, and Dworkin (1986) analyzed the impact of gender diversity on a measure of work alienation experienced by public school teachers.<sup>6</sup> Although the association between both variables was found to be relatively weak, male teachers in female-dominated settings reported significantly lower levels of alienation than did male teachers in non-token positions. In contrast, the results showed that the lower the percentage of female teachers in the school, the higher the degree of work alienation of women teachers. In a more recent study, Dworkin (2007) analyzed the impact of gender diversity on teachers’ burnout. He found no significant relationship between both variables. Although these three studies shed light on aspects that are closely related to well-being at work, they do not explicitly consider the link that exists between teachers’ job satisfaction and gender diversity at school. To our knowledge, this paper is the first to explore this issue at an international level and in the context of lower-secondary education.

### 3. The data

#### 3.1. *The survey*

Data for the analysis come from the TALIS conducted by the OECD in 2018 in 46 participating countries (see OECD 2018): Alberta (Canada), Australia, Austria, Belgium, Brazil, Bulgaria, Ciudad Autónoma de Buenos Aires (Argentina),<sup>7</sup> Chile, Colombia, Croatia, Cyprus, Czech Republic, Denmark, England (United Kingdom), Estonia, Finland, France, Georgia, Hungary, Israel, Italy, Japan, Kazakhstan, the Republic of Korea, Latvia, Lithuania, Malta, Mexico, the Netherlands, New Zealand, Norway, Portugal, Romania, the Russian Federation, Shanghai (China), Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Taiwan (China), Turkey, United Arab Emirates, United States, and Vietnam.

In each country a weighted, two-stage stratified sampling design was used to select schools

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<sup>5</sup> Based on ethnographic interviews of 23 teachers, Sargent (2000) described the life experiences of male teachers in elementary education. We do not report the findings of this qualitative research, because it is based on too small a number of observations and it does not elucidate statistical associations between gender diversity and attitudes at work of male teachers.

<sup>6</sup> Work alienation was described in terms of powerlessness, meaninglessness, normlessness, social isolation, and self-estrangement.

<sup>7</sup> Hereafter designated by the acronym ‘CABA’.

and then teachers within schools randomly. The data include a total of 134,518 lower-secondary education teachers in 7,992 schools. The sample is representative of a total population of 5.3 million lower-secondary education teachers in 280,000 schools in the 46 participating countries. The sample includes schools of at least 2 and seldom more than 50 teachers.

The instruments for data collection consist of two questionnaires. A teacher questionnaire precisely describes teacher's personal characteristics, level of qualification, type of employment, professional development, teaching practices, time spent working, and job satisfaction. A school principal questionnaire asks for information on the school director's personal background, the school background, school leadership, school climate, and school administrative and pedagogical organization. The data maintain, on the whole, high quality standards (see OECD 2018). However, depending on the country, several variables at both the teacher and school levels contain missing values. We deal with the matter of missing data by imputing missing values by chained equations (see Section 4).

### *3.2. Overall job satisfaction*

The survey measures overall job satisfaction using a Cantril ladder question with the following formulation: 'How strongly do you agree or disagree with the following statement: All in all, I am satisfied with my job.' The question was answered on a scale from 1 (strongly disagree) to 4 (strongly agree).<sup>8</sup> Table 1 shows the average ladder score and the distribution of teachers across the different levels of job satisfaction for each country separately and for the pooled data. Considering first all countries together, the results indicate that 29 percent of the respondents expressed high overall satisfaction with their job (level 4 on the scale). Only 1 percent of school personnel were not satisfied with their job (level 1 on the scale). However, the results show huge disparities across countries. To illustrate, the five countries with the highest ladder scores (Colombia, Mexico, Austria, Chile, CABA) have an average job evaluation score 20 percent higher than the five countries with the lowest ladder scores (Taiwan [China], South Africa, Lithuania, Japan, England). Whereas 59 percent of teachers in the five top-ranked countries reported a high level of satisfaction, only 16 percent of teachers in the five bottom-ranked countries did so.

### *3.3. Gender composition of schools*

In this paper, gender composition is operationalized at the group level by means of a continuous variable – the proportion of female teachers in the school – and, alternatively, by categorical measures. Following Kanter (1977), we identify five school types on the basis of the proportional representation of men and women among the teaching staff: schools where women constitute less than 20 percent of all teachers, hereafter referred to as male-dominated schools; schools in which women are a minority, constituting between 20 and 40 percent of the teachers, denominated male-majority schools; schools that are relatively gender balanced, with between

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<sup>8</sup> Obviously the wording of the question has the advantage of brevity. There is no common agreement on the number of scale points to be used in the rating of well-being. Most empirical studies use 4 to 7-point scale (see OECD 2013; Takafumi, Ueshima, and Noguchi 2012).

40 and 60 percent female teachers; schools with between 60 and 80 percent female teachers, hereafter referred to as female-majority schools; and schools with more than 80 percent female teachers, denominated female-dominated schools.

Table 2 shows summary statistics for the percentage of female teachers per school in the various countries under consideration, jointly with the distribution of schools by work group types.

In all countries combined, the percentage of female teachers per school is about 66 percent on average. However, this average hides a wide disparity across countries. Latvia, the Russian Federation, Lithuania, Estonia, and New Zealand have the highest feminization rate of their lower-secondary teaching staff. In these five top-ranked countries, the percentage of female teachers per school averages 84 percent. The female-dominated group represents 71 percent of the total number of lower-secondary schools in these countries, on average. Less than 3 percent of the schools are mixed-sex, male-dominated, or male-majority groups. At the opposite end, gender diversity is comparatively the highest in Mexico, the Netherlands, Colombia, Turkey, and Japan. In these five-bottom-ranked countries, the prevalence of female teachers per school is around 50 percent, on average, reaching a minimum of only 43 percent in Japan. Up to 6 percent of the schools in these five countries are male-dominated schools. On average, 22 and 43 percent are male-majority and gender-balanced work groups, respectively. Less than 30 and 4 percent of schools are female-majority and female-dominated work groups, respectively. Obviously, these figures show clear differences in the gender diversity of schools' teaching staff.



Table 1. Teacher's job satisfaction – Summary statistics<sup>a</sup>.

	Job satisfaction score		Distribution of job satisfaction <sup>b</sup> (%)		
	Mean	Coefficient of variation	Dissatisfied	Moderately satisfied	Highly satisfied
Colombia	3.59	0.12	0.5	35.5	63.9
Mexico	3.58	0.10	0.6	38.9	60.5
Austria	3.45	0.31	0.4	50.5	49.2
Chile	3.38	0.21	1.1	53.7	45.2
CABA	3.35	0.49	1.2	58.5	40.4
Spain	3.33	0.21	0.6	61.3	38.2
Italy	3.26	0.14	0.6	68.7	30.7
Vietnam	3.26	0.11	0.5	69.5	30.0
Alberta	3.24	0.38	1.0	66.9	32.1
Romania	3.24	0.26	0.9	68.2	31.0
Israel	3.22	0.34	1.1	67.2	31.6
Georgia	3.22	0.32	1.2	69.8	29.1
United Arab Emirates	3.21	1.04	2.7	62.4	34.9
Sweden	3.21	0.36	1.2	67.3	31.5
United States	3.21	0.06	1.9	65.2	32.9
Cyprus	3.20	0.76	1.1	69.5	29.5
Denmark	3.19	0.36	0.8	68.6	30.5
Netherlands	3.19	0.17	0.3	74.5	25.2
Norway	3.17	0.47	0.6	74.3	25.1
Turkey	3.17	0.15	2.0	67.8	30.2
Portugal	3.16	0.34	1.1	73.4	25.5
Australia	3.16	0.21	1.5	70.7	27.8
Bulgaria	3.14	0.40	1.0	76.5	22.5
Brazil	3.13	0.09	2.1	70.3	27.7
Croatia	3.13	0.53	1.2	75.4	23.4
Belgium	3.13	0.47	1.3	74.0	24.7
Korea, Rep.	3.12	0.24	1.7	73.7	24.6
Kazakhstan	3.12	0.20	1.1	77.3	21.6
Shanghai	3.11	0.36	1.0	77.5	21.5
Estonia	3.11	0.61	0.5	82.2	17.3
Slovenia	3.09	0.59	0.8	78.9	20.3
Finland	3.09	0.46	0.8	77.4	21.7
Russian Federation	3.06	0.08	0.7	82.9	16.5
Malta	3.05	1.23	2.1	75.4	22.5
Hungary	3.05	0.31	1.1	81.0	17.9
Latvia	3.05	0.45	0.6	84.4	15.0
New Zealand	3.04	0.40	2.3	77.8	19.9
Singapore	3.04	0.60	1.3	82.5	16.2
Czech Republic	3.03	0.30	0.9	84.6	14.6
Slovak Republic	3.03	0.38	0.9	83.6	15.5
France	3.02	0.16	1.7	79.0	19.3
Taiwan, China	3.00	0.30	1.0	84.9	14.1
South Africa	2.98	0.23	3.8	72.0	24.2
Lithuania	2.98	0.55	1.5	82.0	16.4
Japan	2.93	0.16	2.4	83.8	13.8
England	2.90	0.16	3.1	81.4	15.6
Five top-ranked countries <sup>c</sup>	3.55	0.16	0.6	40.8	58.6
Five bottom-ranked countries <sup>d</sup>	2.94	0.22	2.7	81.2	16.1
All countries	3.18	0.20	1.4	69.6	28.9

<sup>a</sup>The teacher is the unit of observation. Summary statistics are computed using population weights and balanced repeated replicate

(BRR) weights with Fay's adjustment for variance estimation, given the complex sample design of TALIS (see OECD 2018).

<sup>b</sup>Dissatisfied: score 1; moderately satisfied: score 2–3; highly satisfied: score 4.

<sup>c</sup>The five countries with the highest average Cantril ladder scores. <sup>d</sup>The five countries with the lowest average Cantril ladder scores. Source: Authors' estimates based on the TALIS 2018 database.

Table 2. Gender composition of the schools<sup>a</sup>.

	Female teachers (%)		School groups <sup>b</sup> (%)				
	Mean	Coefficient of variation	Male-dominated	Majority-male	Gender-balanced	Majority-female	Female-dominated
Latvia	88.3	23.1	-	-	-	15.0	85.0
Russian Federation	83.8	7.1	1.4	-	0.6	27.0	70.9
Lithuania	83.6	27.6	-	-	1.4	22.0	76.6
Estonia	82.6	42.7	-	-	1.0	31.3	67.7
New Zealand	81.9	55.9	2.6	1.9	13.6	20.3	61.5
Georgia	81.0	40.3	3.6	1.5	4.6	25.2	65.0
Slovak Republic	81.0	25.3	-	-	1.2	37.8	61.0
Bulgaria	79.0	36.2	-	2.4	4.6	39.8	53.1
Slovenia	78.1	40.4	-	-	5.0	47.9	47.1
Italy	77.4	14.8	-	-	4.8	48.2	47.0
Hungary	77.3	22.1	-	-	5.0	49.8	45.2
Czech Republic	76.3	27.8	-	1.8	5.2	51.7	41.4
Croatia	76.0	36.6	-	-	5.0	58.8	36.2
Kazakhstan	73.9	21.7	-	0.5	10.4	51.3	37.7
Cyprus	73.6	73.4	-	-	5.4	73.6	21.0
Shanghai	73.1	41.9	-	-	5.9	61.8	32.3
Israel	72.9	67.8	2.9	6.1	12.9	32.1	45.9
Portugal	72.0	39.6	0.7	0.7	10.6	64.0	24.0
Austria	71.6	43.1	-	0.5	12.1	61.4	26.0
Romania	71.0	18.8	-	-	15.2	60.7	24.1
Finland	69.3	33.0	-	-	8.0	80.5	11.5
Malta	69.3	132.5	-	3.8	23.2	47.5	25.5
CABA	68.6	59.2	-	4.2	22.1	52.5	21.2
Brazil	68.5	9.3	0.8	7.1	22.0	40.2	30.0
Belgium	68.1	59.1	-	2.2	21.8	54.2	21.8
Taiwan, China	66.7	44.1	-	1.6	22.5	61.6	14.3
United States	65.4	6.5	1.2	7.4	15.5	65.8	10.1
Vietnam	65.4	20.6	1.8	5.3	25.0	44.4	23.5
Singapore	64.5	87.3	-	-	27.1	64.8	8.1
Korea, Rep.	64.5	36.3	5.3	6.3	18.7	45.9	23.8
France	64.5	19.1	1.3	1.4	26.9	56.8	13.6
Chile	64.1	27.3	1.4	6.3	29.1	43.5	19.8
England	64.0	24.5	-	2.2	31.5	55.2	11.1
Sweden	63.3	42.4	-	5.4	35.7	45.8	13.1
Alberta	63.2	67.4	1.9	8.9	35.1	30.4	23.7
Norway	62.9	49.5	-	4.2	34.2	49.6	12.0
Australia	62.0	39.9	0.7	9.9	28.2	49.2	11.9
United Arab Emirates	60.6	327.2	21.8	1.1	15.5	24.7	37.0
Spain	60.6	34.1	2.8	6.1	30.7	54.7	5.7
South Africa	59.8	27.0	4.1	11.9	28.5	43.0	12.5
Denmark	59.5	41.0	-	10.2	38.5	43.3	8.0
Mexico	54.3	18.1	1.1	18.0	42.9	32.8	5.2
Netherlands	53.7	59.6	0.9	12.3	57.9	28.1	0.9
Colombia	53.4	22.5	4.7	17.5	37.5	35.1	5.2
Turkey	52.0	22.7	6.2	15.6	42.7	31.7	3.9
Japan	42.9	22.2	4.0	42.2	46.8	7.0	
Five top-ranked countries <sup>c</sup>	83.8	15.1	1.4	0.1	1.2	26.4	70.9
Five bottom-ranked countries <sup>d</sup>	51.3	32.7	3.8	21.8	42.7	27.9	3.8
All countries	66.4	27.7	1.7	8.0	21.3	44.6	24.4

<sup>a</sup>The school is the unit of observation. Summary statistics are computed using population weights and balanced repeated replicate (BRR) weights with Fay's adjustment for variance estimation, given the complex sample design of TALIS (see OECD 2018).

<sup>b</sup>Male-dominated: < 20% female teachers; majority-male: 20-40% female teachers; gender-balanced: 40-60% female teachers; female-majority: 60-80% female teachers; female-dominated: > 80% female teachers.

<sup>c</sup>The five countries with the highest average percentage of women.

<sup>d</sup>The five countries with the lowest average percentage of women.

Source: Authors' estimates based on the TALIS 2018 international database.

### 3.4. Ancillary control variables

The main objective of this paper is to evaluate the impact of gender composition on teacher job satisfaction and to examine whether the effects of gender similarity are asymmetrical for men and women. To ensure that the estimated relationships between job satisfaction and gender variety are not spurious, this study also controls for a set of variables that the literature has found to affect teacher job satisfaction. This set of additional factors includes individual characteristics, work-related factors, and school-based variables.

Individual characteristics, or non-work factors, include gender and qualification – that is, formal education. The empirical evidence is mixed regarding the impact of these characteristics on teacher job satisfaction. For example, while De Nobile and McCormick (2008), Kremer-Hayon and Goldstein (1990), and Poppleton and Riseborough (1991) found that female teachers have higher levels of satisfaction than male teachers, Gamero Burón and Lassibille (2016), Menon and Athana- soula-Reppa (2011), and Ninomiya and Okato (1990) found reverse evidence. Similar contradictory evidence exists regarding the relationship between teacher quality, expressed through education and training, and teacher job satisfaction (see, for example, Dang and Rogers 2007; Kremer-Hayon and Goldstein 1990; Perie, Baker, and Whitener 1997; Sargent and Hannum 2005).

Among work-related factors that are unique to a particular individual, we control for the work-employment relationship (full-time/part-time employment), teaching experience, and work content – class size, percentage of low academic achievers and students with behavioral problems in the class, subject taught, and weekly hours worked. While there is a large consensus in the literature on the positive impact of employment conditions<sup>9</sup> on teacher job satisfaction (see, for example, Bennell and Akyeampong 2007; Dang and Rogers 2007; Gamero Burón and Lassibille 2016; Lyons 1981; Newson 1993), the empirical evidence on the impacts of teacher seniority and workload remains uncertain and quite variable depending on the context. To illustrate, research by Gamero Burón and Lassibille (2016) and Griva and Joekes (2003), for example, found experienced teachers to be more satisfied with their job than inexperienced ones, while others argue that a negative relationship exists between the number of years serving in the profession and teacher job satisfaction (see, for example, Chaplain 1995; Poppleton and Riseborough 1991). Among work content factors, the research evidence has also shown that excessive workload and class size act as significant job dissatisfiers for teachers (see, for example, Collie, Shapka, and Perry 2012; Fraser, Draper, and Taylor 1998; Heafford and Jennison 1998; Liu and Ramsey 2008), whereas some others studies have found a positive correlation between hours worked and teacher job satisfaction (see, for example, Sargent and Hannum 2005). Among work-related factors at the individual level, the empirical literature has also shown that disruptive student behavior in the classroom is a powerful job dissatisfier for teachers, whereas teaching gifted students is a significant job satisfier (see, for example, Scott, Stone, and Dinham 2001; Skaalvik and Skaalvik 2011). Based on these studies, the inclusion of these two facets of classroom environment as control variables seems justified. Previous studies have consistently

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<sup>9</sup> Job security is also an important aspect of work quality. Although the TALIS 2018 teacher questionnaire includes questions related to job security, the corresponding information is not available in the TALIS international database.

shown that school climate has an important influence on work engagement and job satisfaction (see, for example, Culver, Wolfle, and Cross 1990; Dou, Devos, and Valcke 2017; Perie, Baker, and Whitener 1997). School climate is a broad term that encompasses many facets of school functioning. In this paper, we take into account climate through the amount of time teachers spend maintaining discipline in the classroom. Research conducted in both non-educational and educational settings has shown that comparison pay is an important influence on job satisfaction (see, for example, Clark and Oswald 1996; Heafford and Jennison 1998; Ladebo 2005; Lévy-Garboua and Montmarquette 2004; Lydon and Chevalier 2002; Perie, Baker, and Whitener 1997; Ward and Sloane 2000). However, as salary data for school personal are not available in TALIS 2018, we are not able to account for within- and between-country variation in teacher salary.

Among school-based factors, lack of control or autonomy is an important aspect of teacher job dissatisfaction (see, for example, Brunetti 2001; Butt et al. 2005; Crossman and Harris 2006; Dou, Devos, and Valcke 2017). In this study, we control for three distinct facets of school autonomy: staffing, budgeting, and instructional policies. Several studies have found that inadequacy of resources or poor physical conditions of the schools are significant sources of teacher dissatisfaction (see, for example, Gamero Burón and Lassibille 2016; Heafford and Jennison 1998; Ssesanga and Garrett 2005). In this paper, school conditions are measured via a composite index based on the availability of a set of teaching and learning materials – instructional material, computers and computer software for instruction, internet access, and library materials. There is some evidence to suggest that teachers in rural areas or suburban areas express greater job satisfaction than teachers in other areas (see, for example, Bogler 2002; Poppleton 1989; Poppleton and Riseborough 1991). Based on these studies, the inclusion of school location as a control variable seems warranted.

Annex Table A1 presents the summary statistics of these variables for each country and for the entire sample of countries. In most cases, the meaning of the variables is clear from their names. Annex Table A2 gives the definitions of variables that need further explanation. Several features in the data are worth mentioning.

Teachers in Lithuania, Portugal, Latvia, Estonia, and Georgia have generally more experience as educators than their peers, with an advantage ranging between six and eight years with respect to the whole sample of countries. While 43 percent of all teachers have completed at least a master's degree or equivalent, significant gaps exist across countries in this regard. To illustrate, teachers in Slovak Republic, Portugal, Czech Republic, Finland, or Croatia tend to hold much better paper qualifications than their counterparts in Denmark, Brazil, Turkey, Kazakhstan, South Africa, and Vietnam. In all of the countries combined, average class size is about 26 students. However, this average hides wide disparities. To illustrate, class size is only 17 on average in the five top-ranked countries (Malta, Kazakhstan, Finland, Estonia, and Georgia), compared with 38 in the five bottom-ranked countries (South Africa, Colombia, Shanghai, Chile, and Vietnam). Teachers in the sampled countries serve quite different clientele. The presence of low academic achievers is the highest in South Africa, Brazil, Turkey, Singapore, and the United States – representing between 25 and 35 percent of the target class, on average. In the five bottom-ranked countries (Latvia, Vietnam, Georgia, the Russian Federation, and Estonia), this proportion lies between 8 and 11 percent only. In all countries combined, around 13 percent of

the students served have behavioral problems, on average. In Brazil and South Africa, this proportion is around 25 percent, while it is less than 5 percent in Japan, Georgia, and Vietnam. Teachers in the TALIS countries work a total of 41 h per week on average; they spend around 13 percent of this time maintaining discipline in the classroom. However, a huge disparity exists across countries. To illustrate, teachers in Japan and Kazakhstan have the heaviest workloads, with a total of 57 and 49 h per week, respectively. Conversely, teachers in Turkey, Italy, Brazil, CABA, and Georgia have among the lowest – between 26 and 32 h per week. Time spent keeping order in the classroom varies between 6 percent (the Russian Federation) and 19 percent (Brazil) of the weekly workload.

Schools also differ in the learning environment they offer. Schools are substantially smaller in Sweden, Alberta, Bulgaria, Georgia, and Norway – with between 200 and 300 students on average

– than schools in Singapore, United Arab Emirates, the Netherlands, Colombia, and England – with more than 900 students on average. Much research has emphasized the importance of school and teacher autonomy as key elements of teacher satisfaction and student performance. In this regard, the results show that schools in Czech Republic, Sweden, Slovak Republic, the Netherlands, Estonia, and Latvia have the highest degree of autonomy on average, while schools in France, South Africa, Romania, Turkey, and CABA have the lowest degree of school-level decision-making. Results not shown to save space indicate that around 40 percent of schools are equipped with all of the factors composing the index of school conditions shown in Annex Table A1. This percentage is the highest in countries like Singapore (91 percent), Slovenia (84 percent), and Australia (74 percent) and the lowest in South Africa (18 percent), Colombia (15 percent), and Vietnam (9 percent).

#### 4. Analytical framework

Three issues related to the data condition the analytical framework used in this paper. The first issue is related to the nature of the satisfaction variable. The job satisfaction models estimated in this paper are based on the hypothesis that any evaluation of job satisfaction is an *ex post* expression of the worker's preference for the position he or she currently holds in relation to another, which is *ideal*. In this context, the reported level of job satisfaction is interpreted as an ordinal indicator of the unobservable subjective well-being that the job provides. The ordinality of the dependent variable implies that linear regression procedures directly applied to the observed data will prove to be invalid. Order probit or logit models are generally used to analyze this type of variable. Such models have two immediate drawbacks. First, the estimated coefficients are not marginal effects. Obtaining such effects requires considering each level of the satisfaction scale (in our case, four levels), which complicates the handling and interpretation of the results. Second, the estimation of complex ordered response models (for example, ordered multilevel models) can easily run into computational problems. This paper remains in the lineal sphere, applying the cardinalized method known as Probit-adapted Ordinary Least Squares (POLS) to our job satisfaction variable (see Van Praag and Ferrer-i-Carbonell 2004 and 2006). This method involves rescaling the ordinal dependent variable to obtain another variable with standard normal distribution, whose values depend on the relative frequencies of ordered

categories in the original dependent variable. As Van Praag and Ferrer-i-Carbonell (2004 and 2006) show, under the assumption of normality of the underlying job satisfaction variable, the results from applying ordinary least squares (OLS) to the cardinalized variable are equivalent to those obtained using ordered probit estimation. Clark, Knabe, and Rätzl (2010), Cornelissen (2009), Gamero Burón and Lassibille (2016), Stevenson and Wolfers (2008), and Van Praag and Ferrer-i-Carbonell (2008) offer examples of this method's application.

The second issue related to the information used in this paper concerns the two-level hierarchical structure of the data. Because teachers are nested in schools, observations within the same school are correlated. This characteristic violates the traditional OLS assumption of uncorrelated error terms, leading to incorrect estimates of the standard errors of the parameters. Specifically, the estimated standard errors involved in traditional statistical tests are clearly underestimated, causing most of the results to be significantly spurious (Hox 1995). The correlation structure underlying this kind of clustered data can be captured using two-level models for each country. Such models consider random effects at the school level in the intercept, slopes, or both. Here, we consider the simplest case, the existence of randomness only in the intercept — that is, in the average level of satisfaction per school. Due to the sampling procedure used in TALIS, we fit weighted multilevel models of job satisfaction, after appropriately rescaling the survey weights (see, for example, Chantala, Blanchette, and Suchindran 2011; Pfeiffermann et al. 1998). To elaborate, for each school  $j$ , with  $j = 1, \dots, J$ , we observe  $n_j$  teachers identified by the following subscript  $i = 1, \dots, n_j$ . Under the approach discussed above, the multilevel model of job satisfaction is as follows:

$$satis_{ij}^c = \beta_0 + \beta'_x x_{ij} + \beta'_z z_j + u_{0j} + \varepsilon_{ij}$$

where  $satis_{ij}^c$  is the cardinalized value of satisfaction for teacher  $i$  in school  $j$ ,  $x_{ij}$  is a vector of his or her personal characteristics,  $z_j$  is a vector of school characteristics,  $\beta'_x$  and  $\beta'_z$  are parameter vectors associated with level-1 and level-2 variables, and  $u_{0j}$  and  $\varepsilon_{ij}$  are error terms at the school and teacher level, respectively.

The third issue is related to the presence of missing values in the data. Although the TALIS data are, one the whole, of reasonable quality, the outcome variable as well as covariates at the teacher and school level are not always completely observed. To illustrate, in all countries combined, 3.5 percent of all teachers surveyed failed to report their job satisfaction level; 22 percent of them failed to respond to at least one of the questions on the non-work and work-related characteristics considered in this paper, except gender, which contains no missing value. About 12 percent of school principals failed to report one or more of the school-level covariates included in our analysis. The missingness rate over all of the variables is about 30 percent for the whole sample of countries; it varies between 12 and 56 percent, depending on the country. Although commonly used, listwise deletion or complete-cases analysis — that is, simply excluding any observation that has missing data on any variables considered in the analysis — may generate selection bias by ignoring incompletely observed cases and may lead to

incorrect standard errors<sup>10</sup> (see, for example, Allison 2002). Addressing the missing data problem by performing simple zero-order regressions<sup>11</sup> or by running modified zero-order regressions<sup>12</sup> is not recommended. As shown by Haitovsky (1968) and Jones (1996), these two methods lead to biased estimates of variances and covariances and to biased estimates of the parameters, respectively. In estimating the two-level models of job satisfaction, we used the multi-variate imputation by chained equations method (see Van Buuren and Groothuis-Oudshoorn 2011) to impute the missing values in the outcome and the teacher- and school-level ancillary covariates. This procedure offers substantial improvements over the other methods, and it is particularly useful for large data sets with complex data structures like TALIS. We imputed qualitative variables using multilogit or logistic models. Continuous variables were imputed using the predictive mean matching imputation method. The imputation procedure took into account the clustered structure of TALIS. A total of five imputed data sets were created.<sup>13</sup>

## 5. The results

We present the empirical results in two parts. The first pertains to the impact of gender diversity – as measured by the proportion of female teachers in school – on the overall job satisfaction of male and female teachers as a whole. The marginal effects for each country and for all countries pooled together<sup>14</sup> are reported in the first column on the left of Table 3 (Model I); the corresponding full regression results are shown in Annex Table A3. The second part presents results separately for male and female teachers. The heterogeneous impacts of gender diversity on overall job satisfaction are obtained by interacting teacher gender with the proportion of female teachers in the school. The marginal effects by gender for each country and for all countries are presented in the two columns on the right of Table 3 (Model II); the full regression results are shown in Annex Table A4.

### 5.1. Overall impacts

General results in Model I (that is, considering the whole set of countries – last row of Table 3) indicate that teachers' job satisfaction is significantly and negatively affected by the demographic composition of their work group. All else remaining the same, a 1 percentage point increase in the proportion of female teachers results in a 0.1 point increase in the job dissatisfaction score of school personnel. This finding is in line with some of the previous research conducted on the topic in non-educational settings (see, for example, Fields and Blum 1997). It is consistent with predictions based on Blau's theory that job satisfaction would be highest for workers in more heterogeneous groups. This general result implies that the gender composition of the teaching staff could be globally a potentially relevant policy variable and that remasculinizing the teaching

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<sup>10</sup> Except when the data are missing completely at random, which is rarely the case.

<sup>11</sup> Namely, replacing missing data by sample means of complete observations.

<sup>12</sup> That is, replacing missing values on an explanatory variable with a zero (or, more generally, with any constant) and including an indicator of missingness as an additional predictor in regression models.

<sup>13</sup> According to Schafer (1997), three to five imputations yield excellent results

<sup>14</sup> CABA, Italy, Singapore, and Spain are excluded from the pooled sample of countries because data for some variables are not available for all respondents or are not applicable.

profession could increase the job satisfaction of school personnel.

However, this general conclusion from cross-country panel data masks considerable differences, and it is not extrapolated to each surveyed country. In this regard, the analysis by individual countries reveals that a process of remasculinization of the teaching force could tend to increase the well-being of teachers in a total of 26 countries (that is, in 60 percent of the cases). However, such a policy would be really effective in only nine of these countries – namely, Australia, England, Georgia, Italy, Kazakhstan, Lithuania, Romania, the Russian Federation, and Spain.<sup>15</sup> According to Table 3, the impact of the proportion of female teachers in the school is negative and statistically significant in these countries, varying from a low of  $-0.24$  (England) to a high of  $-0.57$  (Lithuania), with an average of  $-0.37$ . By contrast, in the remaining 20 countries (that is, in 40 percent of the surveyed countries), an increase in the proportion of male teachers would tend to reduce teachers' job satisfaction. However, in less than half of these countries only – namely, Belgium, Cyprus, Estonia, Israel, the Republic of Korea, the Netherlands, Slovak Republic, United Arab Emirates, and the United States – the marginal effect of the proportion of female teachers is positive and statistically different from zero, varying between  $0.08$  (United Arab Emirates) and  $0.48$  (Cyprus) with an average of  $0.29$ .<sup>16</sup> Otherwise stated, remasculinizing the teaching profession in these nine countries would translate into significantly higher job dissatisfaction among teachers.

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<sup>15</sup> Note, however, that in 3 of these 9 countries – Australia, England and the Russian Federation – the impact of gender diversity is significant at a low level only. In the other 17 countries – Alberta, Brazil, Bulgaria, CABA, Chile, Colombia, Croatia, Czech Republic, Denmark, Finland, Mexico, New Zealand, Portugal, Slovenia, South Africa, Turkey, and Vietnam – the relationship between job satisfaction and gender diversity is negative but insignificant.

<sup>16</sup> In the rest of the countries – Austria, France, Hungary, Japan, Latvia, Malta, Norway, Shanghai, Singapore, Sweden, and Taiwan (China) – the relationship between job satisfaction and gender composition of the teaching staff is positive but insignificant.



Table 3. Marginal effects of the percentage of female teachers in school on teachers' overall job satisfaction<sup>a</sup>.

	Model I All	Model II	
	teachers	Female teachers	Male teachers
Alberta	-0.247	-0.346	-0.112
Australia	-0.299+	-0.603**	0.150
Austria	0.071	0.042	0.145
Belgium	0.196+	0.226+	0.137
Brazil	-0.084	-0.173	0.107
Bulgaria	-0.122	-0.060	-0.293
CABA	-0.072	0.019	-0.276
Chile	-0.001	0.198	-0.310+
Colombia	-0.116	-0.161	-0.071
Croatia	-0.083	-0.240	0.337
Cyprus	0.475+	0.505+	0.396
Czech Republic	-0.099	-0.148	0.048
Denmark	-0.183	-0.181	-0.186
England	-0.238+	-0.086	-0.514*
Estonia	0.302+	0.217	0.697*
Finland	-0.263	-0.272	-0.242
France	0.152	0.381*	-0.222
Georgia	-0.460***	-0.354*	-0.568**
Hungary	0.025	-0.048	0.280
Israel	0.303**	0.160	0.466**
Italy	-0.434***	-0.434**	-0.434
Japan	0.111	0.073	0.138
Kazakhstan	-0.288*	-0.426**	0.083
Korea, Rep.	0.207+	0.050	0.373*
Latvia	0.221	0.190	0.587
Lithuania	-0.568**	-0.537**	-0.714
Malta	0.146	0.127	0.184
Mexico	-0.040	0.011	-0.094
Netherlands	0.357+	-0.244	1.056**
New Zealand	-0.119	-0.210	0.058
Norway	0.181	0.066	0.358
Portugal	-0.223	-0.000	-0.512**
Romania	-0.470**	-0.494**	-0.397
Russian Federation	-0.246+	-0.342+	-0.103
Shanghai	0.118	-0.071	0.648*
Singapore	0.298	0.353	0.138
Slovak Republic	0.294+	0.332+	0.119
Slovenia	-0.173	-0.271	0.186
South Africa	-0.129	-0.208	-0.038
Spain	-0.283**	0.012	-0.537***
Sweden	0.020	-0.220	0.581+
Taiwan, China	0.098	-0.022	0.325
Turkey	-0.067	0.229	-0.324+
United Arab Emirates	0.081*	0.073	0.087+
United States	0.418*	0.338	0.518*
Vietnam	-0.134	-0.198	-0.031
All countries	-0.103*	-0.148**	-0.031

<sup>a</sup>Based on the estimation of multilevel models with random intercepts that include teacher- and school-level characteristics. The full regression results are shown in Annex Table A3 (Model I) and Annex Table A4 (Model II).

Significance levels: \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.10$ ; +  $p < 0.20$ .

Source: Authors' estimates based on the TALIS 2018 international database.

## *5.2. Differences in impacts by gender*

How do male and female teachers respond differently to greater female representation in schools? To answer this question, we consider the Model II results in Table 3, which reproduces the marginal impacts of gender composition separately for both sexes.

Considering first the whole set of countries (last row of Table 3), the results show no significant relationship between men's job satisfaction and workplace gender diversity. Accordingly, male teachers in female-dominated or female-majority schools are as satisfied as their counterparts in gender-balanced, male-majority, or male-dominated schools (Figure 1). In contrast, the estimation results indicate that, everything else being equal, the higher the percentage of female teachers in the school, the significantly lower the job satisfaction of female teachers. More specifically, a 1 percentage point increase in the proportion of female teachers results in a 0.15 point increase in the job dissatisfaction score of female teachers, all else being the same. In the considered countries, sexual isolation and minority position are significantly beneficial to the job satisfaction of female teachers (Figure 1). To some extent, this last finding is consistent with results by Allmendinger and Hackman (1995), Tsui, Egan, and O'Reilly (1992), and Wharton and Baron (1987), who found that, in non-educational settings, women in balanced- or female-dominated settings are less job satisfied than women in predominantly male settings. According to the two general patterns described here, female teachers would significantly benefit from a process of remasculinization of the teaching force, while at the same time lowering the proportion of women in schools would leave unchanged the job satisfaction of male teachers.

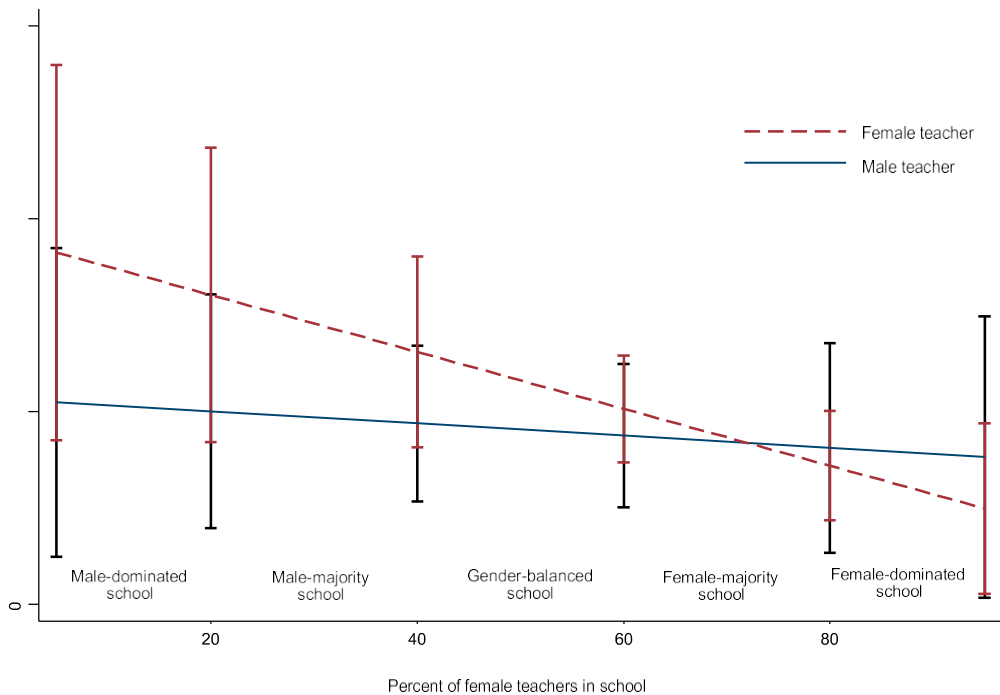


Figure 1. Adjusted predictions of teachers' job satisfaction score – All countries.

Note: Based on regression model in Annex Table A3 - last column.

However, these general conclusions mask sharp disparities, and they do not hold true for all countries. In this regard, the analysis of individual countries shows that in 22 of the 46 countries surveyed,<sup>17</sup> the gender composition of the teaching staff has no significant impact on the job satisfaction level of both male and female teachers, everything else being the same. Otherwise stated, in about half of the countries considered, neither the similarity/attraction perspective nor Blau's or Kanter's theory is a powerful conceptual framework for predicting the effects of the gender composition of the teaching staff in the school on the job satisfaction of male and female teachers. In these 22 countries, the effect of the gender composition of the teaching staff is gender neutral. At the standard levels of significance, and all else being the same, token teachers, teachers in a minority position, teachers in a gender-balanced context, or teachers in a majority or dominant position express similar levels of satisfaction, whatever their gender. From an educational policy perspective, these results indicate that reforms aimed at promoting greater gender diversity in schools would not necessarily affect the job satisfaction of male and female teachers in these countries. Three reasons for this finding are suggested: infrequent sexist stereotyping in these countries, similar job expectations for male and female teachers, and effective cooperation and collaboration in the workplace. Further research efforts clearly are needed to identify fully the mechanisms that are behind the conclusion reached for these

<sup>17</sup> Namely, in Alberta, Austria, Brazil, Bulgaria, CABA, Colombia, Croatia, Czech Republic, Denmark, Finland, Hungary, Japan, Latvia, Malta, Mexico, New Zealand, Norway, Singapore, Slovenia, South Africa, Taiwan (China), and Vietnam.

countries.

Among the 24 remaining countries, four distinct groups of countries emerge from the results in Table 3.<sup>18</sup> Despite their differences, each group shares a common trait. In all of these countries, the effects of gender diversity are asymmetrical for men and women. Otherwise stated, the impacts of the proportion of female teachers in school on the job satisfaction of male and female teachers are not gender neutral.

In a first group, consisting of Belgium, Cyprus, France, and Slovak Republic, the proportion of female teachers has no significant impact on the job satisfaction of male teachers, but it does have a positive and significant effect on the job satisfaction of female teachers. In these countries, after controlling for observed differences in teachers' personal and school characteristics, a 1 percentage point increase in the proportion of female teachers in the school results in an increase of between 0.2 (Belgium) and 0.5 (Cyprus) point in the job satisfaction score of female teachers. These positive effects are at odds with the predictions of the similarity/attraction perspective. In some way, they are also consistent with the findings by Burke and McKeen (1996) and Martin and Harkreader (1993), who showed that women working in predominantly male non-educational organizations are less satisfied than their counterparts. According to these results, in this first group of countries, a process of remasculinization of the teaching force would not affect the job satisfaction of male teachers; however, female teachers would probably be less satisfied with their job.

A second group of countries is made up of Australia, Italy, Kazakhstan, Lithuania, Romania, and the Russian Federation. In these six countries, the proportion of female teachers in the school has no effect on the job satisfaction of male teachers. However, female teachers in these countries extract significantly more satisfaction from their work as the proportion of male teachers in the work group increases. After controlling for observed differences in teachers' personal and work-related characteristics, a 1 percentage point increase in the proportion of female teachers in the work group results in an increase from a low of 0.3 (the Russian Federation) to a high of 0.6 (Australia) point in the dissatisfaction score of female teachers. According to these results, hiring more men in this second group of countries would not translate into significant changes in the job satisfaction of male teachers, all else being the same. However, increasing the proportion of men in schools would improve the job satisfaction of female teachers. One of the reasons for this finding is that in a gender-diversified context, female teachers may have more opportunities to interact with and receive support from their male peers.

In a third group of countries – Estonia, Israel, the Republic of Korea, the Netherlands, Shanghai, Sweden, Turkey, United Arab Emirates, and the United States – gender diversity has no effect on the job satisfaction of female teachers, but does have a positive and significant impact on the job satisfaction of male teachers. In these countries, a 1 percentage point increase in the proportion of female teachers leads to an increase in the job satisfaction score of male teachers that ranges between 0.1 (United Arab Emirates) and 1.1 (the Netherlands) point. This positive pattern is consistent with the findings of Martin and Harkreader (1993), and Wharton and Baron (1991), who found that, in non-educational settings, men's job satisfaction is higher

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<sup>18</sup> Leaving apart Georgia, which is the sole country where the proportion of women in the school has a significant and negative impact on the job satisfaction of both male and female teachers.

when they work in organizations with higher proportions of women or when there are more women in their job ladder.

In a fourth group, consisting of Chile, England, Portugal, Spain, and Turkey, the proportion of female teachers in the school has no significant effect on the job satisfaction of female teachers. However, gender diversity has a negative and significant impact on the job satisfaction of male teachers. In these countries, teacher's job satisfaction score decreases between 0.3 (Chile) and 0.5 (Spain) point for each percentage point increase in the proportion of female teachers in the school. This result is consistent with the findings of Allmendinger and Hackman (1995) and Peccei and Lee (2005), who also found that men are more job satisfied in male-dominated than in gender-balanced or female-dominated work settings. The reasons why male teachers in these countries extract significantly less satisfaction as school personnel becomes more feminized are probably manifold. Among them are, for example, a) a decrease in male teacher's commitment levels and cooperation as women tend to dominate schools numerically; b) less recognition of male teacher's work by their peers and society at-large; and c) lack of advancement opportunities for male teachers. Whatever the reasons, a process of remasculinization of the teaching force in these five countries could contribute to an increase in the job satisfaction of male teachers, while leaving unchanged the job satisfaction of female teachers.

## 6. Conclusion

In most countries, the teaching profession has become highly feminized. The phenomenon is particularly prominent in preprimary and primary education, but it persists, although less markedly, in secondary education. In many countries, the gender imbalance among teachers begins to be of concern to policy makers and educational planners, and where this issue is potentially problematic, more attention is now paid to the recruitment and retention of a more diverse teacher force.

In this paper, we have investigated the impacts of gender diversity – as measured through the proportion of female teachers in the school – on the job satisfaction of lower-secondary teachers. Our results are based on international data from the 2018 TALIS. The findings encompass a wide variety of countries and school systems, covering the major regions in the world, with the exception of Africa.

We found mixed empirical evidence for a relationship between teachers' job satisfaction and gender diversity.

In about half of the countries surveyed, the percentage of female teachers in the school has no significant impact on the job satisfaction of both male and female teachers, after controlling for individual and school-level characteristics. This is an important result in itself, for it suggests that, in a wide range of cases, neither the predictions of the similarity/attraction perspective nor those of the theories of Kanter and Blau are valid. From this finding, it can be inferred that, when the proportion of female teachers in predominantly female schools or female-dominated schools decreases, male teachers do not experience significant changes in their job satisfaction, compared to their counterparts who are working in other types of schools. Similarly, our results also suggest that redressing the gender imbalance would not translate into significant changes in

the job satisfaction level of female teachers. The reasons for this finding are beyond the scope of this paper, but the empirical evidence suggests that, at least in these countries, a) the teaching profession is probably not associated with a strong gender stereotype, and b) regardless of the gender diversity among school personnel, male and female teachers probably have very similar job expectations.

In the remaining countries, we found asymmetric impacts of the proportion of female teachers in the school on the overall job satisfaction of teachers. However, beyond this result, no global tendency emerged in the relationship between gender diversity and teachers' job satisfaction across gender and countries. In some countries, remasculinizing the teaching profession would not affect the job satisfaction level of female teachers, but could translate into higher or lower job satisfaction for male teachers. However, in an almost similar number of countries, we found that redressing the gender imbalance in the teaching profession could have the opposite effect. Increasing the proportion of male teachers could make female teachers more satisfied or, on the contrary, more dissatisfied with their job, but could leave unchanged the job satisfaction level of male teachers. The reasons for this finding are probably complex and multifactor. They probably have to do, among other things, with the recognition of teacher's work by their peers and the society at-large, the commitment levels and cooperation of male and female teachers, and the relative opportunities for advancement of both men and women in their teaching job. In this regard, more in-depth investigations are needed to elucidate the mechanisms involved in the generation of gender differences across countries.

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**Annex Table A1. Teacher- and school-level characteristics – Summary statistics<sup>a</sup>**

	Alberta	Australia	Austria	Belgium	Brazil	Bulgaria	CABA	Chile	Taiwan, China	Colombia	Croatia	Cyprus	Czech Republic	Denmark	England	Estonia	Finland	France	Georgia	Hungary	Israel	Italy	Japan	Kazakhstan
<i>Teacher characteristics<sup>b</sup></i>																								
<i>Non-work-related characteristics</i>																								
Female	0.64	0.62	0.70	0.70	0.69	0.80	0.68	0.60	0.69	0.56	0.80	0.73	0.76	0.60	0.64	0.84	0.70	0.66	0.84	0.79	0.75	0.79	0.42	0.77
Education level	0.15	0.21	0.47	0.14	0.07	0.75	0.17	0.16	0.66	0.54	0.92	0.53	0.94	0.09	0.27	0.73	0.93	0.70	0.79	0.36	0.48	0.86	0.11	0.04
<i>Work-related characteristics</i>																								
Experience as a teacher (yrs)	13.02	15.03	17.88	15.23	15.59	19.91	15.62	13.35	15.45	17.08	14.38	15.71	17.44	15.24	12.90	22.20	15.82	16.71	21.86	20.22	15.13	17.86	17.14	15.71
Working full time	0.90	0.85	0.70	0.71	0.27	0.89	0.29	0.54	0.98	0.82	0.76	0.87	0.84	0.86	0.80	0.68	0.88	0.84	0.53	0.88	0.70	0.85	0.91	0.78
Class size	23.78	23.44	20.75	18.99	30.11	21.02	26.33	33.39	25.57	37.24	18.66	21.25	21.82	22.15	24.59	16.94	18.06	26.02	16.60	19.95	27.75	21.52	30.77	18.07
Composition of the class (%)																								
Low academic achievers	19.70	19.69	23.72	24.15	27.15	19.68	21.51	24.13	18.63	20.31	11.73	23.91	15.97	16.19	19.41	8.25	15.34	20.59	11.00	17.01	22.65	15.54	14.85	11.37
Students with behavioral problems	10.60	12.03	11.00	13.02	26.59	10.87	10.97	19.65	8.85	15.44	7.06	12.77	7.87	6.10	10.44	7.40	10.66	11.44	4.46	10.36	16.06	8.79	4.83	4.85
Subject taught																								
Humanities & arts	0.37	0.37	0.53	0.46	0.39	0.42	0.36	0.44	0.40	0.35	0.52	0.44	0.44	0.53	0.37	0.43	0.45	0.45	0.45	0.45	0.48	0.60	0.40	0.40
Math & science	0.38	0.40	0.29	0.34	0.30	0.34	0.32	0.30	0.36	0.42	0.32	0.41	0.34	0.35	0.39	0.34	0.34	0.32	0.32	0.31	0.34	0.27	0.36	0.36
Social studies	0.16	0.13	0.07	0.11	0.17	0.12	0.21	0.11	0.12	0.13	0.11	0.07	0.14	0.06	0.13	0.11	0.09	0.11	0.16	0.08	0.09	0.05	0.12	0.12
Physical education	0.07	0.09	0.08	0.07	0.10	0.11	0.08	0.13	0.08	0.07	0.05	0.06	0.06	0.04	0.09	0.10	0.10	0.12	0.06	0.10	0.06	0.06	0.10	0.09
Other	0.02	0.02	0.03	0.01	0.04	0.00	0.02	0.02	0.05	0.02	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.00	0.01	0.05	0.02	0.02	0.02	0.03
Total hours working per week	46.98	45.18	37.63	35.49	30.15	38.82	28.55	39.03	36.37	40.87	39.65	34.85	39.06	39.21	47.29	36.08	33.62	37.46	26.43	39.78	33.41	31.05	56.98	49.24
Time spent maintaining discipline (%)	12.81	14.48	13.92	17.37	18.95	10.10	15.56	17.56	14.98	13.09	9.07	13.11	8.93	10.28	12.56	7.81	13.56	16.80	7.64	11.43	14.43	13.37	12.32	10.15
<i>School characteristics</i>																								
School size	294.50	764.16	329.92	684.36	520.80	294.04	522.02	526.80	881.83	969.15	365.19	399.48	396.17	421.85	900.74	355.97	388.25	515.73	272.41	334.54	511.23	n.a.	318.96	488.59
Index of school autonomy	8.02	9.18	7.36	8.10	7.13	9.84	3.97	8.49	8.31	6.70	7.38	6.42	11.36	9.09	9.79	10.06	8.30	6.14	7.99	7.98	8.90	7.98	7.68	9.27
Index of school conditions	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Location																								
Village/small town (<15,000 inhab.)	0.53	0.20	0.61	0.34	0.43	0.66	0.00	0.23	0.36	0.51	0.60	0.39	0.55	0.54	0.28	0.69	0.45	0.60	0.69	0.58	0.29	0.56	0.12	0.78
Town (15,001–100,000 inhab.)	0.12	0.23	0.13	0.42	0.18	0.17	0.00	0.25	0.28	0.11	0.21	0.30	0.26	0.31	0.39	0.15	0.31	0.27	0.10	0.22	0.41	0.22	0.31	0.09
City or large city (>100,000 inhab.)	0.35	0.57	0.26	0.24	0.38	0.17	1.00	0.52	0.36	0.38	0.20	0.32	0.19	0.15	0.34	0.15	0.25	0.13	0.21	0.20	0.30	0.22	0.58	0.13

<sup>a</sup> Summary statistics are computed using population weights and balanced repeated replicate (BRR) weights with Fay's adjustment for variance estimation (not shown here but available from the authors upon request), given the complex sample design of TALIS (see OECD 2018).

<sup>b</sup> The teacher is the unit of observation.

<sup>c</sup> The school is the unit of observation.

Source: Authors' estimates based on the TALIS 2018 international database.

**Annex Table A1.** Teacher- and school-level characteristics –Summary statistics<sup>a</sup> (continuation)

	Korea, Rep.	Latvia	Lithuania	Malta	Mexico	Netherlands	New Zealand	Norway	Portugal	Romania	Russian Federation	Shanghai	Singapore	Slovak Republi	Slovenia	South Africa	Spain	Sweden	Turkey	United Arab Emirates	United States	Viet Nam	All countries
<i>Teacher characteristics<sup>b</sup></i>																							
<i>Non-work-related characteristics</i>																							
Female	0.69	0.90	0.85	0.70	0.58	0.54	0.67	0.63	0.74	0.73	0.86	0.74	0.63	0.83	0.79	0.60	0.61	0.67	0.55	0.62	0.64	0.68	0.68
Education level	0.38	0.62	0.38	0.25	0.25	0.41	0.16	0.34	0.95	0.39	0.78	0.13	0.23	0.98	0.69	0.03	n.a.	0.70	0.07	0.32	0.59	0.01	0.43
	16.37	22.85	23.80	12.41	14.10	16.08	15.43	14.72	22.94	17.15	19.22	16.71	11.49	17.51	18.17	14.37	17.01	15.52	10.88	13.35	14.31	16.12	15.86
<i>Work-related characteristics</i>																							
Experience as a teacher (yrs)	0.98	0.67	0.61	0.96	0.32	0.40	0.85	0.82	0.90	0.80	0.87	0.98	0.94	0.87	0.91	0.97	0.85	0.84	0.85	0.95	0.97	0.64	0.78
Working full time	26.60	18.86	19.14	18.29	32.45	24.46	25.29	22.93	22.18	21.74	20.26	34.86	32.82	19.45	19.11	40.24	25.10	22.43	27.31	27.97	27.69	33.28	26.36
Class size	14.40	11.10	11.70	23.76	20.27	13.99	20.55	17.69	21.45	19.30	9.98	16.12	26.09	12.25	15.71	35.17	22.94	18.29	26.37	22.20	25.21	11.09	19.57
Composition of the class (%) Low academic achievers	10.12	9.29	6.35	13.90	16.29	10.95	11.75	6.69	14.56	8.65	7.52	7.18	12.39	9.56	10.30	24.23	11.05	9.04	15.83	13.07	17.38	4.16	13.30
Students with behavioral problems	0.40	0.45	0.51	0.44	0.28	0.41	0.42	0.52	0.38	0.45	0.38	0.42	0.39	0.47	0.42	0.38	0.46	0.53	0.46	0.43	0.37	0.51	0.41
Subject taught	0.36	0.36	0.30	0.40	0.41	0.32	0.38	0.32	0.38	0.33	0.37	0.38	0.36	0.34	0.35	0.45	0.35	0.29	0.34	0.39	0.39	0.40	0.36
Humanities or arts	0.12	0.11	0.11	0.07	0.20	0.14	0.10	0.09	0.14	0.11	0.14	0.09	0.09	0.11	0.10	0.14	0.12	0.10	0.09	0.10	0.11	0.04	0.12
Math or science	0.08	0.07	0.07	0.04	0.09	0.09	0.07	0.04	0.09	0.10	0.09	0.08	0.07	0.07	0.12	0.01	0.06	0.07	0.07	0.05	0.09	0.01	0.09
Social studies	0.04	0.01	0.02	0.05	0.01	0.03	0.03	0.02	0.01	0.01	0.02	0.03	0.10	0.00	0.01	0.02	0.02	0.01	0.05	0.02	0.03	0.04	0.03
Physical education	34.71	35.95	36.15	37.17	36.17	36.46	45.93	40.27	39.88	34.24	43.54	45.84	45.89	37.56	39.74	35.89	36.90	42.86	31.87	41.34	46.85	46.18	41.07
Other	14.10	9.68	7.85	17.20	12.32	17.26	15.05	9.69	17.08	9.62	5.98	7.84	16.11	12.02	11.46	17.30	16.42	11.31	17.96	13.72	13.22	8.16	12.81
Total hours working per week	423.38	302.92	338.81	455.3	401.6	1026.	304.1	218.07	858.93	476.31	442.93	918.6	1115.5	306.37	390.51	618.8	617.6	298.6	384.2	1050.1	448.37	489.73	490.18
Time spent maintaining discipline (%)				1	5	7	5					1				5	6	3	6				
<i>School characteristics<sup>c</sup></i>																							
School size	8.11	10.06	9.67	7.67	7.04	10.13	9.16	7.80	7.74	5.71	9.26	7.05	8.03	10.51	9.27	6.04	6.74	11.07	5.01	7.08	8.88	7.24	7.90
Index of school autonomy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Index of school conditions	0.29	0.70	0.60	0.62	0.33	0.20	0.41	0.68	0.51	0.67	0.64	0.15	0.00	0.66	0.81	0.54	0.31	0.31	0.46	0.25	0.44	0.89	0.48
Location	0.07	0.17	0.15	0.38	0.24	0.50	0.32	0.20	0.34	0.14	0.14	0.18	0.00	0.26	0.07	0.20	0.33	0.24	0.22	0.14	0.26	0.02	0.21
Village/ small town (<15,000 inhab.)	0.63	0.13	0.25	0.00	0.42	0.29	0.27	0.13	0.15	0.19	0.23	0.67	1.00	0.09	0.11	0.26	0.35	0.45	0.32	0.61	0.30	0.09	0.31
Town (15,001-100,000 inhab.)																							
City or large city (>100,000 inhab.)																							

<sup>a</sup> Summary statistics are computed using population weights and balanced repeated replicate (BRR) weights with Fay's adjustment for variance estimation (not shown here but available from the authors upon request), given the complex sample design of TALIS (see OECD 2018).

<sup>b</sup> The teacher is the unit of observation.

<sup>c</sup> The school is the unit of observation.

Source: Authors' estimates based on the TALIS 2018 international database.



**Annex Table A2. Definition of some variables**

Variable	Definition
Education level	Education level is measured by a dummy variable indicating whether the teacher has completed ISCED7 (master's or equivalent level) or ISCED8 (doctoral or equivalent level); ISCED6 (bachelor's or equivalent level) or below is the reference group.
Class size, composition of the class, and subject taught	<p>The information refers to the first class the teacher taught to lower-secondary education students in this particular school on the last Tuesday (after 11 a.m.) preceding the day of the survey. In case the teacher did not teach on Tuesdays, the information refers to the first ISCED2 class taught on a day following this last Tuesday. This class is referred to as the target class.</p> <p>Class size is a continuous variable indicating the number of students enrolled in the teacher's target class. The subjects taught in the target class are defined as follows:</p> <p>Humanities or arts: reading, writing and literature; modern foreign languages; ancient Greek and/or Latin; arts (arts, music, visual arts, practical art, drama, performance music, photography, drawing, creative handicraft, creative needlework); religion and/or ethics (religion, history of religions, religion culture, ethics).</p> <p><i>Math or science</i>: mathematics (mathematics with statistics, geometry, algebra); science (science, physics, physical science, chemistry, biology, human biology, environmental science, agriculture/horticulture/forestry); technology (orientation in technology, including information technology, computer studies, construction/surveying, electronics, graphics and design, keyboard skills, word processing, workshop technology/design technology).</p> <p><i>Social studies</i>: social studies, community studies, contemporary studies, economics, environmental studies, geography, history, humanities, legal studies, studies of the own country, social sciences, ethical thinking, philosophy.</p> <p><i>Physical education</i>: physical education, gymnastics, dance, health.</p> <p>Other</p>
Total hours working per week	60-minute hours spent in total on teaching, planning lessons, marking student work, collaborating with other teachers, participating in staff meetings, and working on other tasks related to the job at this particular school, during the most recent complete calendar school. Tasks that took place during weekends, evenings, or other off-classrooms hours are also included.
Time spent maintaining discipline (%)	The information refers to the percentage of class time the teacher spent maintaining discipline in the target class
School autonomy	School autonomy is measured on a scale that takes into account the level of responsibility of the school in a) appointing, hiring, dismissing, or suspending teachers – autonomy for staffing; b) establishing teachers' starting salaries, determining teachers' salary increases, deciding on budget allocations within the school – autonomy for budgeting; c) establishing student disciplinary policies and student assessment policies – autonomy for educational policies; d) determining course content and deciding which courses are offered – autonomy for instructional policies. The items were evaluated on a three-point scale, with each item having a response category of 1 for "no autonomy," 2 for "mixed autonomy," 3 for "school autonomy." The index of school autonomy was obtained by summing up the scores of the items. It varies between 2 and 12 in the sampled schools.
Index of school conditions	School conditions are measured via an asset-based index (see, for example, Filmer and Pritchett 2001). This index is constructed using principal components analysis based on the following physical conditions of the school: no shortage or inadequacy of instructional material, computers and computer software for instruction, internet access, library material, instructional space, and physical infrastructures. The Index has a mean of 100 and a standard deviation of 10. It ranges on average from approximately 108 in schools with all of these features to 86 in those with none of them.

**Annex Table A3.** Impact of the proportion of female teachers in the school, individual characteristics, and school environment on overall job satisfaction<sup>a</sup>

	Alberta	Australia	Austria	Belgium	Brazil	Bulgaria	CABA	Chile	Taiwan, China	Colombia	Croatia	Cyprus	Czech Republic	Denmark	England	Estonia	Finland	France	Georgia	Hungary	Israel	Italy	Japan	Kazakhstan
Percent female teachers	-0.25	-0.30 <sup>+</sup>	0.07	0.20 <sup>+</sup>	-0.08	-0.12	-0.07	-0.00	0.10	-0.12	-0.08	0.48 <sup>+</sup>	-0.10	-0.18	-0.24 <sup>+</sup>	0.30 <sup>+</sup>	-0.26	0.15	-0.46 <sup>***</sup>	0.03	0.30 <sup>*</sup>	-0.43 <sup>***</sup>	0.11	-0.29 <sup>*</sup>
<i>Non-work-related characteristics</i>																								
Female	0.03	0.00	0.02	-0.04 <sup>+</sup>	-0.02	-0.05	0.12 <sup>**</sup>	0.13 <sup>***</sup>	-0.09 <sup>**</sup>	0.10 <sup>*</sup>	0.01	-0.06	0.03	0.00	0.01	0.04	0.00	0.05	0.11 <sup>*</sup>	0.11 <sup>**</sup>	-0.07 <sup>+</sup>	-0.02	-0.07 <sup>*</sup>	-0.03
Education level	0.10	0.08 <sup>*</sup>	-0.09 <sup>**</sup>	0.06 <sup>+</sup>	-0.15 <sup>*</sup>	-0.11 <sup>***</sup>	-0.02	0.07	0.05 <sup>*</sup>	-0.05	-0.20 <sup>***</sup>	0.00	-0.18 <sup>**</sup>	-0.04	-0.06 <sup>+</sup>	0.01	-0.12 <sup>*</sup>	-0.02	0.02	-0.02	0.01	-0.02	0.03	-0.07
<i>Work-related characteristics</i>																								
Experience as a teacher (yrs)	0.00	0.00	-0.00 <sup>***</sup>	-0.00 <sup>***</sup>	0.00 <sup>**</sup>	0.00	0.00	0.01 <sup>***</sup>	-0.00	0.01 <sup>***</sup>	-0.01 <sup>***</sup>	0.00	-0.00 <sup>+</sup>	0.00	0.00	-0.00	0.00 <sup>*</sup>	-0.01 <sup>***</sup>	0.00	0.00 <sup>*</sup>	0.00	-0.00 <sup>+</sup>	-0.00	0.01 <sup>***</sup>
Working full time	-0.11	0.11 <sup>+</sup>	0.10 <sup>**</sup>	0.07 <sup>**</sup>	-0.01	-0.11 <sup>**</sup>	0.00	0.08 <sup>*</sup>	-0.04	0.17 <sup>***</sup>	0.02	-0.06	0.01	0.09	0.14 <sup>**</sup>	0.06 <sup>*</sup>	0.22 <sup>***</sup>	0.05	0.05 <sup>+</sup>	-0.07	0.15 <sup>***</sup>	0.05	-0.00	-0.01
Class size	0.01	0.01	-0.00	-0.00	0.00 <sup>+</sup>	-0.00	0.00 <sup>+</sup>	-0.00	-0.00 <sup>**</sup>	0.00	0.00	-0.00	0.00	-0.00	-0.01 <sup>+</sup>	0.00	-0.00 <sup>*</sup>	-0.01 <sup>+</sup>	-0.00	0.00 <sup>+</sup>	-0.00 <sup>+</sup>	0.00	0.00	0.00
Composition of the class (%)																								
Low academic achievers	-0.00	0.00	-0.00	-0.00 <sup>*</sup>	-0.00 <sup>***</sup>	-0.00 <sup>+</sup>	-0.00	-0.00 <sup>+</sup>	-0.00	-0.00 <sup>**</sup>	-0.00 <sup>***</sup>	-0.00	-0.00 <sup>***</sup>	-0.00 <sup>*</sup>	-0.00	-0.00	0.00	-0.00 <sup>**</sup>	-0.00 <sup>+</sup>	-0.00 <sup>**</sup>	-0.00 <sup>+</sup>	-0.00 <sup>***</sup>	-0.00	-0.00 <sup>***</sup>
Students with behavioral problems	-0.00	-0.00 <sup>+</sup>	-0.00	-0.00 <sup>+</sup>	0.00	0.00 <sup>+</sup>	-0.00	0.00	0.00	-0.00	-0.00	-0.00 <sup>**</sup>	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00 <sup>+</sup>	-0.00	0.00	0.00	0.00
Subject taught																								
Math or science	0.06	-0.09 <sup>+</sup>	-0.03	0.03	-0.06	-0.03	0.04	0.02	-0.03	0.11 <sup>**</sup>	-0.02	-0.04	-0.02	-0.00	-0.08 <sup>+</sup>	0.05 <sup>+</sup>	0.10 <sup>**</sup>	-0.00	-0.09 <sup>+</sup>	0.03	-0.09 <sup>*</sup>	-0.05	0.02	0.02
Social studies	-0.12	0.02	0.04	-0.00	-0.07	0.06	0.07	-0.17 <sup>*</sup>	-0.06	0.09	-0.03	-0.05	0.02	0.05	0.05	0.09 <sup>*</sup>	0.15 <sup>**</sup>	-0.08 <sup>+</sup>	0.03	-0.01	-0.14 <sup>+</sup>	-0.06	0.11 <sup>*</sup>	-0.04
Physical education	0.10	0.15 <sup>*</sup>	-0.03	0.04	-0.05	0.21 <sup>***</sup>	0.15 <sup>*</sup>	0.11	0.16 <sup>***</sup>	0.07	0.06	0.15	-0.01	0.11	0.04	0.09 <sup>*</sup>	0.13 <sup>**</sup>	0.11 <sup>+</sup>	0.09	0.12 <sup>*</sup>	-0.05	0.19 <sup>*</sup>	0.08	0.08
Other	-0.25 <sup>+</sup>	0.13	0.01	0.10	-0.05	0.02	-0.02	0.15	0.07	0.02	0.41 <sup>*</sup>	0.10	0.07	-0.22 <sup>+</sup>	-0.09	0.34 <sup>**</sup>	0.30 <sup>***</sup>	0.14	0.11	0.11	0.17	-0.05	-0.08	0.07
Total hours working per week	-0.00 <sup>*</sup>	-0.00	-0.00 <sup>**</sup>	-0.00 <sup>**</sup>	-0.00	-0.00	0.00 <sup>**</sup>	0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.01 <sup>***</sup>	-0.00 <sup>***</sup>	-0.00	-0.01 <sup>***</sup>	0.00	0.00 <sup>*</sup>	0.00 <sup>*</sup>	-0.00 <sup>+</sup>	-0.00	-0.00 <sup>**</sup>	-0.00
Time spent maintaining discipline (%)	-0.01 <sup>*</sup>	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	-0.00 <sup>***</sup>	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	-0.00 <sup>+</sup>	-0.01 <sup>***</sup>	-0.01 <sup>**</sup>	-0.00 <sup>**</sup>	-0.00 <sup>+</sup>	-0.00 <sup>**</sup>	-0.01 <sup>***</sup>	-0.00 <sup>**</sup>	0.00	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	-0.00	-0.00 <sup>*</sup>	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	-0.00	-0.00 <sup>*</sup>
<i>School characteristics</i>																								
School size	-0.00	-0.00 <sup>*</sup>	-0.00	-0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00 <sup>+</sup>	0.00	-0.00	-0.00	-0.00 <sup>***</sup>	-0.00	-0.00	-0.00	0.00	0.00	-0.00	-0.00	-	0.00	0.00 <sup>*</sup>
Index of school autonomy	0.03	-0.02	0.01	0.06 <sup>***</sup>	0.02 <sup>*</sup>	0.01	-0.03	-0.01	0.01	-0.02	-0.02	-0.02	-0.01	0.04 <sup>**</sup>	0.00	-0.01	0.02 <sup>+</sup>	0.03 <sup>**</sup>	0.00	0.01	-0.01	0.01	0.01	0.01
Index of school conditions	0.00	-0.00	0.00	0.01 <sup>***</sup>	-0.00 <sup>+</sup>	-0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00 <sup>+</sup>	-0.00	0.00	-0.00	0.00	0.00 <sup>*</sup>	-0.00	-0.00	0.00	0.00	-0.00	0.00	0.00
Location																								
Town	0.04	-0.07	-0.06	0.06 <sup>+</sup>	0.05	-0.05	-	-0.01	-0.00	-0.00	-0.04	-0.06	0.02	0.16 <sup>***</sup>	0.01	0.02	0.09 <sup>*</sup>	-0.01	0.06	-0.03	-0.06	-0.00	0.04	0.01
City or large city	0.15 <sup>*</sup>	-0.04	-0.02	0.07 <sup>*</sup>	-0.09 <sup>*</sup>	-0.08 <sup>+</sup>	0.00	-0.06	-0.00	-0.02	-0.05	-0.02	0.00	0.16 <sup>**</sup>	0.05	0.02	0.08 <sup>+</sup>	0.09 <sup>*</sup>	-0.02	-0.10 <sup>**</sup>	-0.02	0.09 <sup>**</sup>	-0.01	-0.05
Intercept	-0.16	0.56	0.24	-0.71 <sup>***</sup>	0.63 <sup>**</sup>	0.48 <sup>+</sup>	-0.05	0.03	0.03	-0.07	0.65 <sup>**</sup>	0.31	0.65 <sup>*</sup>	0.01	0.79 <sup>**</sup>	-0.31	-0.17	0.30	0.61 <sup>*</sup>	-0.22	0.05	0.46 <sup>*</sup>	-0.02	0.20
Var (Level 1: teachers)	0.01 <sup>***</sup>	0.03 <sup>***</sup>	0.01 <sup>***</sup>	0.02 <sup>***</sup>	0.02 <sup>***</sup>	0.02 <sup>***</sup>	0.01 <sup>***</sup>	0.03 <sup>***</sup>	0.01 <sup>***</sup>	0.02 <sup>***</sup>	0.02 <sup>***</sup>	0.01 <sup>***</sup>	0.02 <sup>***</sup>	0.01 <sup>***</sup>	0.01 <sup>***</sup>	0.01 <sup>***</sup>	0.01 <sup>***</sup>	0.01 <sup>***</sup>	0.04 <sup>***</sup>	0.02 <sup>***</sup>	0.01 <sup>***</sup>	0.01 <sup>***</sup>	0.02 <sup>***</sup>	0.01 <sup>***</sup>
Var (Level 2: schools)	0.68 <sup>***</sup>	0.71 <sup>***</sup>	0.69 <sup>***</sup>	0.72 <sup>***</sup>	0.71 <sup>***</sup>	0.65 <sup>***</sup>	0.67 <sup>***</sup>	0.69 <sup>***</sup>	0.71 <sup>***</sup>	0.59 <sup>***</sup>	0.72 <sup>***</sup>	0.72 <sup>***</sup>	0.66 <sup>***</sup>	0.72 <sup>***</sup>	0.78 <sup>***</sup>	0.62 <sup>***</sup>	0.70 <sup>***</sup>	0.72 <sup>***</sup>	0.68 <sup>***</sup>	0.69 <sup>***</sup>	0.72 <sup>***</sup>	0.67 <sup>***</sup>	0.72 <sup>***</sup>	0.68 <sup>***</sup>
F model	1.96 <sup>***</sup>	2.70 <sup>***</sup>	4.06 <sup>***</sup>	5.75 <sup>***</sup>	5.64 <sup>***</sup>	3.88 <sup>***</sup>	3.92 <sup>***</sup>	3.89 <sup>***</sup>	3.61 <sup>***</sup>	4.62 <sup>***</sup>	2.25 <sup>***</sup>	2.14 <sup>***</sup>	2.21 <sup>***</sup>	4.95 <sup>***</sup>	2.00 <sup>***</sup>	1.39 <sup>+</sup>	4.37 <sup>***</sup>	4.65 <sup>***</sup>	1.30 <sup>+</sup>	2.55 <sup>***</sup>	2.29 <sup>***</sup>	3.19 <sup>***</sup>	1.87 <sup>***</sup>	3.55
Number of teachers	1,077	3,573	4,255	5,257	2,447	2,862	1,910	1,963	3,835	2,398	3,358	1,611	3,447	2,001	2,376	3,004	2,851	3,006	3,101	3,245	2,627	3,612	3,555	6,566
Number of schools	122	233	246	302	185	200	117	179	200	154	188	88	219	141	149	195	148	176	192	189	172	191	196	331

<sup>a</sup> POLS estimates of the following multilevel model with random intercept:  $\eta_{ij} = \beta_0 + \beta_1 F_{ij} + \beta_2 X_{ij} + \beta_3 S_{ij} + \epsilon_{ij}$ , where  $\eta_{ij}$  is the cardinalized value of satisfaction for teacher  $i$  in school  $j$ ,  $F_{ij}$  is the proportion of female teachers in school  $j$ ,  $X_{ij}$  is a dummy variable accounting for 1 if teacher  $i$  in school  $j$  is female and zero otherwise,  $S_{ij}$  is a vector of personal characteristics,  $\epsilon_{ij}$  denotes a vector of school characteristics, and  $\epsilon_{ij}$  and  $\epsilon_{ij}$  are error terms at the school and teacher level, respectively.

Significance levels: \*\*\* p<0.01; \*\* p<0.05; \* p<0.10; + p<0.20.

Source: Authors' estimates based on the TALIS 2018 international database.

**Annex Table A3.** Impact of the proportion of female teachers in the school, individual characteristics, and school environment on overall job satisfaction<sup>a</sup> (continuation)

	Korea, Rep.	Latvia	Lithuania	Malta	Mexico	Netherlands	New Zealand	Norway	Portugal	Romania	Russian Federation	Shanghai	Singapore	Slovak Republic	Slovenia	South Africa	Spain	Sweden	Turkey	United Arab Emirates	United States	Vietnam	All countries
Percent of female teachers	0.21 <sup>+</sup>	0.22	-0.57 <sup>**</sup>	0.15	-0.04	0.36 <sup>+</sup>	-0.12	0.18	-0.22	-0.47 <sup>**</sup>	-0.25 <sup>+</sup>	0.12	0.30	0.29 <sup>+</sup>	-0.17	-0.13	-0.28 <sup>**</sup>	0.02	-0.07	0.08 <sup>*</sup>	0.42 <sup>*</sup>	-0.13	-0.10 <sup>*</sup>
<i>Non-work-related characteristics</i>																							
Female	-0.09 <sup>*</sup>	-0.07	0.01	-0.14 <sup>**</sup>	0.00	0.08	0.04	0.10 <sup>***</sup>	0.03	0.05	0.01	-0.02	-0.07 <sup>*</sup>	-0.00	0.07	-0.03	0.09 <sup>**</sup>	0.09 <sup>+</sup>	0.01	-0.06 <sup>**</sup>	0.04	-0.03	0.01
Education level	0.06 <sup>+</sup>	0.02	0.08 <sup>**</sup>	-0.19 <sup>***</sup>	0.05 <sup>+</sup>	-0.11 <sup>*</sup>	0.04	0.01	-0.14 <sup>*</sup>	-0.02	-0.02	-0.08 <sup>*</sup>	0.10 <sup>**</sup>	-0.05	0.02	-0.15		-0.07 <sup>+</sup>	-0.12 <sup>+</sup>	-0.06 <sup>**</sup>	-0.02	0.06	-0.04 <sup>+</sup>
<i>Work-related characteristics</i>																							
Experience as a teacher (yrs)	-0.00	0.00	0.00 <sup>**</sup>	-0.00	0.01 <sup>***</sup>	-0.00	0.00	-0.00 <sup>***</sup>	0.00 <sup>+</sup>	0.00 <sup>*</sup>	0.01 <sup>***</sup>	0.00	0.01 <sup>***</sup>	-0.00	0.00	0.00	-0.01 <sup>***</sup>	0.00	-0.00	0.01 <sup>***</sup>	0.01	0.01 <sup>***</sup>	0.01 <sup>***</sup>
Working full time	0.03	-0.01	-0.01	-0.12	0.06 <sup>+</sup>	0.12 <sup>**</sup>	0.07	0.03	-0.16 <sup>***</sup>	-0.05	0.04	0.14 <sup>*</sup>	0.07	-0.02	-0.05	-0.34 <sup>*</sup>	-0.07 <sup>+</sup>	0.00	-0.02	0.03	-0.29 <sup>+</sup>	0.05	0.02
Class size	-0.00 <sup>+</sup>	-0.00	-0.00 <sup>*</sup>	-0.00 <sup>+</sup>	0.00	-0.01 <sup>+</sup>	-0.01 <sup>***</sup>	0.01 <sup>**</sup>	-0.00	-0.01 <sup>+</sup>	0.00	0.00	-0.00	0.00	-0.00	0.00 <sup>+</sup>	0.00	0.00 <sup>+</sup>	0.00 <sup>+</sup>	-0.00	-0.00	0.00	0.00
<i>Composition of the class (%)</i>																							
Low academic achievers	0.00	-0.00	-0.00 <sup>***</sup>	-0.00	-0.00 <sup>***</sup>	-0.00 <sup>+</sup>	0.00 <sup>+</sup>	-0.00 <sup>+</sup>	-0.00	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	-0.00	0.00 <sup>*</sup>	-0.00 <sup>**</sup>	0.00	-0.00 <sup>*</sup>	-0.00	-0.00	-0.00 <sup>***</sup>	-0.00 <sup>***</sup>	-0.00	-0.00	-0.01 <sup>***</sup>
Students with behavioral problems	-0.00 <sup>**</sup>	-0.00 <sup>+</sup>	-0.00	-0.00	-0.00	0.00	-0.00 <sup>*</sup>	-0.00	-0.00	0.00 <sup>*</sup>	0.00 <sup>**</sup>	-0.00 <sup>*</sup>	-0.00 <sup>+</sup>	0.00	-0.01 <sup>***</sup>	0.00	-0.00	0.00	-0.00	-0.00 <sup>**</sup>	0.00	-0.00	0.00 <sup>+</sup>
<i>Subject taught</i>																							
Math or science	-0.02	0.01	-0.01	0.01	0.00	0.13 <sup>+</sup>	-0.09	0.03	0.04	-0.02	0.09 <sup>**</sup>	0.03	-0.03	0.03	0.04	-0.11 <sup>+</sup>	0.04 <sup>+</sup>	-0.07	-0.08 <sup>**</sup>	-0.10 <sup>***</sup>	-0.05	-0.01	-0.02
Social studies	-0.01	-0.07	-0.07	-0.11	0.01	0.09	-0.02	-0.02	0.01	0.01	-0.01	0.03	-0.13 <sup>*</sup>	-0.11 <sup>*</sup>	0.06	-0.02	0.07	-0.07	0.01	-0.03	-0.12	-0.15 <sup>+</sup>	-0.03
Physical education	-0.04	0.02	0.17 <sup>**</sup>	-0.03	0.04	0.01	0.02	0.09	0.13 <sup>**</sup>	0.15 <sup>**</sup>	0.09 <sup>+</sup>	0.20 <sup>***</sup>	0.09	-0.11 <sup>+</sup>	0.13 <sup>*</sup>	-0.13	0.19 <sup>***</sup>	0.03	0.17 <sup>**</sup>	-0.03	0.18	0.01	0.07 <sup>*</sup>
Other	0.11	0.17	0.04	-0.08	0.08	-0.14	0.36 <sup>+</sup>	0.10	0.20 <sup>+</sup>	0.17	0.19 <sup>**</sup>	0.04	-0.00	-0.06	0.20	-0.06	0.06	-0.09	0.01	0.08	0.10	0.08	0.06
Total hours working per week	0.00 <sup>***</sup>	0.00	-0.00	-0.00 <sup>**</sup>	0.00	0.00	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	0.00 <sup>+</sup>	0.00	-0.00	0.00	-0.00	-0.00	-0.00	-0.00 <sup>**</sup>	0.00	-0.00	0.00	-0.00 <sup>*</sup>	-0.00	0.00	-0.00 <sup>***</sup>
Time spent maintaining discipline (%)	-0.00	-0.01 <sup>*</sup>	-0.01 <sup>**</sup>	-0.00 <sup>+</sup>	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	-0.00 <sup>*</sup>	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	-0.01 <sup>**</sup>	-0.01 <sup>***</sup>	-0.00 <sup>**</sup>	-0.01 <sup>***</sup>	-0.01 <sup>**</sup>	0.00	-0.01 <sup>***</sup>	-0.01 <sup>***</sup>	-0.00	-0.00 <sup>+</sup>	-0.00	-0.00	-0.01 <sup>**</sup>
<i>School characteristics</i>																							
School size	-0.00 <sup>+</sup>	0.00	0.00	-0.00 <sup>*</sup>	0.00	-0.00	-0.00	-0.00	0.00 <sup>+</sup>	0.00	-0.00	0.00	-0.00	-0.00	0.00 <sup>*</sup>	0.00 <sup>*</sup>	0.00 <sup>**</sup>	0.00	0.00	-0.00	-0.00	0.00 <sup>*</sup>	-0.00 <sup>**</sup>
Index of school autonomy	-0.01	-0.05	-0.01	0.04 <sup>***</sup>	0.01 <sup>*</sup>	-0.00	-0.01	-0.01	0.01	-0.00	-0.03 <sup>+</sup>	-0.00	0.06 <sup>***</sup>	0.01	-0.01	0.03 <sup>+</sup>	0.00	-0.03	-0.02 <sup>+</sup>	-0.01	0.03 <sup>+</sup>	0.01	0.01
Index of school conditions	-0.00	-0.00	-0.00	0.00 <sup>+</sup>	-0.00	-0.01 <sup>**</sup>	0.00	0.00	0.00	0.00	0.00 <sup>*</sup>	-0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00	0.01 <sup>**</sup>	0.00	0.00	-0.00	0.00
<i>Location</i>																							
Town	-0.01	0.00	-0.00	0.02	-0.01	-0.03	-0.05	0.08 <sup>+</sup>	0.05	0.02	0.11 <sup>+</sup>	-0.06	-0.03	-0.03	-0.07	0.16 <sup>*</sup>	-0.07 <sup>+</sup>	-0.01	-0.03	0.00	-0.06	0.02	0.04 <sup>+</sup>
City or large city	0.02	0.03	0.06 <sup>+</sup>		0.02	0.02	-0.02	-0.01	0.10 <sup>**</sup>	0.00	0.03	-0.00	0.00	-0.04	0.01	0.06	-0.10 <sup>**</sup>	0.05	-0.07	-0.02	-0.06	-0.13 <sup>**</sup>	-0.001
Intercept	0.22	0.49	0.80 <sup>***</sup>	0.17	0.00	0.75 <sup>*</sup>	0.54	0.01	0.34 <sup>+</sup>	0.44 <sup>+</sup>	0.03	-0.04	-0.53 <sup>*</sup>	0.04	0.25	0.32	0.45 <sup>**</sup>	0.52	-0.19	0.33 <sup>**</sup>	-0.35	-0.08	0.09
Var (Level 1: teachers)	0.01 <sup>***</sup>	0.03 <sup>***</sup>	0.02 <sup>***</sup>	0.00	0.01 <sup>***</sup>	0.00	0.02 <sup>***</sup>	0.02 <sup>***</sup>	0.00 <sup>***</sup>	0.03 <sup>***</sup>	0.02 <sup>***</sup>	0.00	0.01 <sup>***</sup>	0.01 <sup>***</sup>	0.01 <sup>***</sup>	0.07 <sup>***</sup>	0.01 <sup>***</sup>	0.01 <sup>***</sup>	0.02 <sup>***</sup>	0.02 <sup>***</sup>	0.01 <sup>***</sup>	0.03 <sup>***</sup>	0.03 <sup>***</sup>
Var (Level 2: schools)	0.71 <sup>***</sup>	0.62 <sup>***</sup>	0.72 <sup>***</sup>	0.75 <sup>***</sup>	0.63 <sup>***</sup>	0.69 <sup>***</sup>	0.68 <sup>***</sup>	0.68 <sup>***</sup>	0.71 <sup>***</sup>	0.68 <sup>***</sup>	0.64 <sup>***</sup>	0.70 <sup>***</sup>	0.69 <sup>***</sup>	0.68 <sup>***</sup>	0.68 <sup>***</sup>	0.73 <sup>***</sup>	0.69 <sup>***</sup>	0.73 <sup>***</sup>	0.73 <sup>***</sup>	0.73 <sup>***</sup>	0.74 <sup>***</sup>	0.63 <sup>***</sup>	0.70 <sup>***</sup>
F model	1.74 <sup>**</sup>	2.30 <sup>***</sup>	3.25 <sup>***</sup>	4.42 <sup>***</sup>	3.16 <sup>***</sup>	3.30 <sup>***</sup>	2.14 <sup>***</sup>	4.83 <sup>***</sup>	6.09 <sup>***</sup>	3.31 <sup>***</sup>	2.91 <sup>***</sup>	3.81 <sup>***</sup>	5.77 <sup>***</sup>	1.46 <sup>*</sup>	1.73 <sup>**</sup>	1.67 <sup>**</sup>	3.38 <sup>***</sup>	1.98 <sup>***</sup>	2.61 <sup>***</sup>	9.98 <sup>***</sup>	2.60 <sup>***</sup>	1.06 <sup>***</sup>	6.00 <sup>***</sup>
Number of teachers	2,931	2,315	3,759	1,656	2,926	1,884	2,235	4,154	3,676	3,658	4,011	3,976	3,252	3,015	2,094	2,046	7,407	2,782	3,952	8,648	2,560	3,825	134,518
Number of schools	163	135	195	55	193	116	182	185	200	199	230	198	167	176	132	170	399	180	196	521	165	196	7,992

<sup>a</sup> POLS estimates of the following multilevel model with random intercept:  $\eta_{ij}$ , where  $\eta_{ij}$  is the cardinalized value of satisfaction for teacher  $i$  in school  $j$ ,  $\beta_j$  is the proportion of female teachers in school  $j$ ,  $\gamma_j$  is a dummy variable accounting for 1 if teacher  $i$  in school  $j$  is female and zero otherwise,  $\delta_j$  is a vector of personal characteristics,  $\epsilon_j$  denotes a vector of school characteristics, and  $\nu_i$  and  $\omega_j$  are error terms at the school and teacher level, respectively.

Significance levels: \*\*\* p<0.01; \*\* p<0.05; \* p<0.10; + p<0.20.

Source: Authors' estimates based on the TALIS 2018 international database.

**Annex Table A4.** Impact of the proportion of female teachers in the school, individual characteristics and school environment on overall job satisfaction – with gender heterogeneous effects<sup>a</sup>

	Alberta	Australia	Austria	Belgium	Brazil	Bulgaria	CABA	Chile	Taiwan, China	Colombia	Croatia	Cyprus	Czech Republic	Denmark	England	Estonia	Finland	France	Georgia	Hungary	Israel	Italy	Japan	Kazakhstan
Percent female teachers	-0.11	0.15	0.14	0.14	0.11	-0.29	-0.28	-0.31	0.33	-0.07	0.34	0.40	0.05	-0.19	-0.51*	0.70*	-0.24	-0.22	-0.57**	0.28	0.47**	-0.43	0.14	0.08
Percent female teachers*Female	-0.23	-0.75**	-0.10	0.09	-0.28	0.23	0.30	0.51*	-0.35	-0.09	-0.58	0.11	-0.20	0.00	0.43	-0.48	-0.03	0.60*	0.21	-0.33	-0.31	-0.00	-0.07	-0.51*
<i>Non-work-related characteristics</i>																								
Female	0.17	0.46**	0.09	-0.10	0.15	-0.22	-0.08	-0.18	0.13	0.14	0.43	-0.14	0.17	-0.00	-0.25	0.42	0.02	-0.34 <sup>+</sup>	-0.05	0.35	0.13	-0.02	-0.04	0.32*
Education level	0.11	0.08 <sup>+</sup>	-0.09**	0.06 <sup>+</sup>	-0.15*	-0.11***	-0.02	0.08 <sup>+</sup>	0.05*	-0.05	-0.19***	0.00	-0.19**	-0.04	-0.06 <sup>+</sup>	0.01	-0.12*	-0.02	0.02	-0.02	0.01	-0.02	0.03	-0.07
<i>Work-related characteristics</i>																								
Experience as a teacher (yrs)	0.00	0.00	-0.00***	-0.00***	0.00**	0.00	0.00	0.01***	-0.00	0.01***	-0.01***	0.00	-0.00 <sup>+</sup>	0.00	0.00	-0.00	0.00*	-0.01***	0.00	0.00**	0.00	-0.00 <sup>+</sup>	-0.00	0.01***
Working full time	-0.11	0.11 <sup>+</sup>	0.10**	0.07**	-0.01	-0.11**	-0.00	0.08*	-0.04	0.17***	0.02	-0.06	0.01	0.09	0.14**	0.06*	0.22***	0.05	0.05 <sup>+</sup>	-0.07	0.15***	0.05	-0.00	-0.01
Class size	0.00	0.01	-0.00	-0.00	0.00 <sup>+</sup>	-0.00	0.00 <sup>+</sup>	-0.00	-0.00**	0.00	0.00	-0.00	0.00	-0.00	-0.01 <sup>+</sup>	0.00	-0.00*	-0.01 <sup>+</sup>	-0.00	0.00 <sup>+</sup>	-0.00*	0.00	0.00	0.00
Composition of the class (%)																								
Low academic achievers	0.00	0.00	-0.00	-0.00*	-0.00***	-0.00 <sup>+</sup>	-0.00	-0.00	-0.00	-0.00**	-0.00***	-0.00	-0.00***	-0.00*	-0.00	-0.00	0.00	-0.00**	-0.00 <sup>+</sup>	-0.00**	-0.00 <sup>+</sup>	-0.00***	-0.00	-0.00***
Students with behavioral problems	-0.00	-0.00 <sup>+</sup>	-0.00	-0.00 <sup>+</sup>	0.00	0.00 <sup>+</sup>	-0.00	0.00	0.00	-0.00	-0.00	-0.00**	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00 <sup>+</sup>	-0.00	0.00	0.00	0.00
Subject taught																								
Math or science	0.06	-0.09 <sup>+</sup>	-0.03	0.03	-0.06	-0.03	0.04	0.02	-0.03	0.11**	-0.02	-0.04	-0.02	-0.00	-0.08 <sup>+</sup>	0.05 <sup>+</sup>	0.10**	-0.00	-0.09 <sup>+</sup>	0.03	-0.09*	-0.05	0.02	0.02
Social studies	-0.13 <sup>+</sup>	0.03	0.04	-0.00	-0.07	0.06	0.07	-0.18*	-0.06	0.09	-0.03	-0.05	0.02	0.05	0.05	0.09*	0.15**	-0.08 <sup>+</sup>	0.03	-0.01	-0.14 <sup>+</sup>	-0.06	0.11*	-0.04
Physical education	0.10	0.16*	-0.03	0.04	-0.05	0.21***	0.15*	0.12 <sup>+</sup>	0.16***	0.07	0.07	0.15	-0.01	0.11	0.04	0.09*	0.13**	0.10 <sup>+</sup>	0.10	0.11*	-0.06	0.19*	0.08	0.06
Other	-0.25 <sup>+</sup>	0.11	0.01	0.09	-0.04	0.02	-0.02	0.15	0.07	0.02	0.41*	0.10	0.07	-0.22 <sup>+</sup>	-0.09	0.35**	0.30***	0.14	0.11	0.11	0.16	-0.05	-0.08	0.08
Total hours working per week	-0.00*	-0.00	-0.00	-0.00	-0.00	-0.00	0.00**	0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.01***	-0.00***	-0.00	-0.01***	0.00	0.00	0.00*	-0.00 <sup>+</sup>	-0.00	-0.00**	-0.00
Time spent maintaining discipline (%)	-0.01*	-0.01***	-0.01***	-0.00***	-0.01***	-0.01***	-0.01***	-0.00 <sup>+</sup>	-0.01***	-0.01**	-0.00**	-0.00 <sup>+</sup>	-0.00**	-0.01***	-0.00**	0.00	-0.01***	-0.01***	-0.00	-0.00*	-0.01***	-0.01***	-0.00	-0.00*
<i>School characteristics</i>																								
School size	-0.00	-0.00**	-0.00	-0.00	-0.00	0.00 <sup>+</sup>	0.00	-0.00	0.00	-0.00 <sup>+</sup>	0.00	-0.00	-0.00	-0.00***	-0.00	-0.00	-0.00	0.00 <sup>+</sup>	0.00	-0.00	-0.00		0.00	0.00*
Index of school autonomy	0.03	-0.01	0.01	0.06***	0.02*	0.01	-0.03	-0.01	0.01	-0.02	-0.02	-0.02	-0.01	0.04**	-0.00	-0.01	0.02 <sup>+</sup>	0.03**	0.00	0.01	-0.00	0.01	0.01	0.01
Index of school conditions	0.00	-0.00	0.00	0.00***	-0.00 <sup>+</sup>	-0.00	0.00	0.00	0.00	0.00	-0.00	-0.00 <sup>+</sup>	-0.00	0.00	-0.00	0.00	0.00*	-0.00	-0.00	0.00	0.00	-0.00	0.00	0.00
Location																								
Town	0.04	-0.07	-0.06	0.06 <sup>+</sup>	0.05	-0.05		-0.01	-0.00	-0.00	-0.04	-0.06	0.02	0.16***	0.01	0.02	0.09*	-0.01	0.05	-0.03	-0.05	-0.00	0.04	0.01
City or large city	0.14*	-0.04	-0.02	0.07*	-0.10*	-0.08 <sup>+</sup>	0.00	-0.06	-0.00	-0.02	-0.05	-0.02	0.00	0.16**	0.05	0.02	0.08 <sup>+</sup>	0.09*	-0.03	-0.10**	-0.02	0.09**	-0.01	-0.05
Intercept	-0.24	0.28	0.18	-0.67***	0.53	0.61 <sup>+</sup>	0.09	0.18	-0.11	-0.09	0.34	0.36	0.55 <sup>+</sup>	0.01	0.97***	-0.61 <sup>+</sup>	-0.18	0.51	0.67**	-0.40	-0.07	0.46 <sup>+</sup>	-0.03	-0.06
Var (Level 1: teachers)	0.01***	0.03***	0.01***	0.02***	0.02***	0.02***	0.01***	0.03***	0.01***	0.02***	0.02***	0.01***	0.02***	0.01***	0.01***	0.01***	0.01***	0.01***	0.04***	0.02***	0.01***	0.01***	0.02***	0.01***
Var (Level 2: schools)	0.68***	0.71***	0.69***	0.72***	0.70***	0.65***	0.67***	0.69***	0.71***	0.59***	0.72***	0.72***	0.66***	0.72***	0.78***	0.62***	0.70***	0.72***	0.68***	0.69***	0.72***	0.67***	0.72***	0.67***
F model	1.91***	2.79***	3.90***	5.43***	5.26***	3.66***	3.72***	4.02***	3.49***	4.56***	2.24***	2.11***	2.16***	4.74***	2.16***	1.39 <sup>+</sup>	4.19***	4.55***	1.24	2.49***	2.19***	3.03***	1.83	4.21***
Number of teachers	1,077	3,573	4,255	5,257	2,447	2,862	1,910	1,963	3,835	2,398	3,358	1,611	3,447	2,001	2,376	3,004	2,851	3,006	3,101	3,245	2,627	3,612	3,555	6,566
Number of schools	122	233	246	302	185	200	117	179	200	154	188	88	219	141	149	195	148	176	192	189	172	191	196	331

<sup>a</sup> POLS estimates of the following multilevel model with random intercept:  $\eta_{ij}$ , where  $\eta_{ij}$  is the cardinalized value of satisfaction for teacher  $i$  in school  $j$ ,  $\beta$  is the proportion of female

teachers in school  $j$ ,  $\delta_i$  is a dummy variable accounting for 1 if teacher  $i$  in school  $j$  is female and zero otherwise,  $\gamma$  is an interaction term between teacher gender and the proportion of female teachers in school  $j$ ,  $\alpha$  is a vector of personal characteristics,  $\beta$  denotes a vector of school characteristics, and  $\epsilon_{ij}$  and  $\epsilon_i$  are error terms at the school and teacher level, respectively.

Significance levels: \*\*\* p<0.01; \*\* p<0.05; \* p<0.10; + p<0.20.

Source: Authors' estimates based on the TALIS 2018 international database.

**Annex Table A4.** Impact of the proportion of female teachers in the school, individual characteristics, and school environment on overall job satisfaction – with gender heterogeneous effects<sup>a</sup>  
(continuation)

	Korea	Latvia	Lithuania	Malta	Mexico	Netherlands	New Zealand	Norway	Portugal	Romania	Russian Federation	Shanghai	Singapore	Slovak Republic	Slovenia	South Africa	Spain	Sweden	Turkey	United Arab Emirates	United States	Vietnam	All countries
Percent female teachers	0.37*	0.59	-0.71	0.18	-0.09	1.06**	0.06	0.36	-0.51**	-0.40	-0.10	0.65*	0.14	0.12	0.19	-0.04	-0.54***	0.58*	-0.32*	0.09*	0.52*	-0.03	-0.03
Percent female teachers*Female	-0.32	-0.40	0.18	-0.06	0.11	-1.30**	-0.27	-0.29	0.51*	-0.10	-0.24	-0.72*	0.21	0.21	-0.46	-0.17	0.55**	-0.80*	0.55*	-0.01	-0.18	-0.17	-0.12
<i>Non-work-related characteristics</i>																							
Female	0.11	0.27	-0.13	-0.10	-0.05	0.76**	0.21	0.28	-0.33*	0.12	0.20	0.49*	-0.21	-0.17	0.41	0.07	-0.24*	0.59*	-0.30*	-0.06	0.15	0.08	0.08
Education level	0.07*	0.02	0.08**	-0.19***	0.05*	-0.11*	0.04	0.01	-0.14*	-0.02	-0.02	-0.08*	0.10**	-0.05	0.02	-0.15	-	-0.07*	-0.13*	-0.06**	-0.02	0.06	-0.04*
<i>Work-related characteristics</i>																							
Experience as a teacher (yrs)	-0.00	0.00	0.00**	-0.00	0.01***	-0.00	0.00	-0.00***	0.00*	0.00*	0.01***	0.00	0.01***	-0.00	-0.00	0.00	-0.01***	0.00	-0.00	0.01***	0.01	0.01***	0.00***
Working full time	0.03	-0.01	-0.01	-0.12	0.06*	0.12**	0.07	0.03	-0.16***	-0.05	0.04	0.14*	0.07	-0.02	-0.05	-0.34*	-0.07*	0.00	-0.02	0.03	-0.29*	0.05	0.02
Class size	-0.00*	-0.00	-0.00*	-0.00*	0.00	-0.01*	-0.01***	0.01**	-0.00	-0.01*	0.00	0.00	-0.00	0.00	-0.00	0.00*	0.00	0.00*	0.00*	-0.00	-0.00	0.00	0.00
<i>Composition of the class (%)</i>																							
Low academic achievers	0.00	-0.00	-0.00***	-0.00	-0.00***	-0.00	0.00*	-0.00*	-0.00	-0.01***	-0.01***	-0.00	0.00*	-0.00**	0.00	-0.00*	-0.00	-0.00	-0.00***	-0.00***	-0.00	-0.00	-0.00***
Students with behavioral problems	-0.00**	-0.00*	-0.00	-0.00	-0.00	0.00	-0.00*	-0.00	-0.00	0.00*	0.00**	-0.00*	-0.00*	0.00	-0.01***	0.00	-0.00	0.00	-0.00	-0.00**	0.00	-0.00	0.00*
<i>Subject taught</i>																							
Math or science	-0.02	0.01	-0.01	0.01	0.00	0.13*	-0.09	0.03	0.04	-0.02	0.09**	0.03	-0.04	0.03	0.04	-0.11*	0.04*	-0.07	-0.08**	-0.10***	-0.05	-0.01	-0.02
Social studies	-0.01	-0.07	-0.07	-0.11	0.01	0.09	-0.02	-0.01	0.01	0.01	-0.01	0.03	-0.13*	-0.11*	0.06	-0.02	0.07	-0.07	0.01	-0.03	-0.12	-0.15*	-0.03
Physical education	-0.05	0.02	0.17**	-0.03	0.04	0.02	0.02	0.09	0.13**	0.15**	0.09	0.19***	0.09	-0.10	0.12*	-0.13	0.19***	0.03	0.17**	-0.03	0.18	0.01	0.06*
Other	0.11	0.17	0.04	-0.08	0.08	-0.15	0.37*	0.10	0.19*	0.17	0.19**	0.04	-0.01	-0.06	0.19	-0.06	0.06	-0.08	0.02	0.08	0.10	0.08	0.06
Total hours working per week	0.00***	0.00	-0.00	-0.00**	0.00	-0.00	-0.01***	-0.01***	0.00*	0.00	-0.00*	0.00	-0.00	-0.00	-0.00	-0.00**	0.00	-0.00	0.00	-0.00*	-0.00	0.00	-0.00***
Time spent maintaining discipline (%)	-0.00	-0.01*	-0.01**	-0.00*	-0.01***	-0.01***	-0.00*	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.00**	-0.01***	-0.01**	0.00	-0.01***	-0.01***	-0.00	-0.00*	-0.00	-0.00	-0.00**
<i>School characteristics</i>																							
School size	-0.00*	0.00	0.00	-0.00*	0.00	-0.00	-0.00	-0.00	0.00*	0.00	-0.00	0.00	-0.00	-0.00	0.00*	0.00*	0.00**	0.00	0.00	-0.00	-0.00	0.00*	-0.00**
Index of school autonomy	-0.01	-0.05	-0.01	0.04***	0.01*	-0.00	-0.01	-0.01	0.01	-0.00	-0.03*	-0.00	0.06***	0.01	-0.01	0.03*	-0.00	-0.03	-0.02*	-0.01	0.03*	0.01	0.01
Index of school conditions	-0.00	-0.00	-0.00	0.00*	-0.00	-0.01**	0.00	0.00	0.00	0.00	0.00*	-0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00	0.01**	0.00	0.00	-0.00	0.00
<i>Location</i>																							
Town	-0.02	0.00	-0.00	0.02	-0.01	-0.03	-0.07	0.07*	0.04	0.02	0.11*	-0.07*	-	-0.03	-0.07	0.16*	-0.07*	-0.01	-0.03	0.00	-0.06	0.02	0.04*
City or large city	0.03	0.03	0.06*	-	0.02	0.01	-0.03	-0.01	0.09**	0.00	0.03	-0.01	-	-0.04	0.01	0.06	-0.09**	0.05	-0.07	-0.02	-0.06	-0.12**	-0.00
Intercept	0.12	0.18	0.91*	0.15	0.03	0.43	0.48	-0.09	0.54**	0.40*	-0.07	-0.39*	-0.42*	0.18	-0.02	0.28	0.61***	0.24	-0.04	0.33**	-0.43	-0.13	0.05
Var (Level 1: teachers)	0.01***	0.03***	0.02***	0.00	0.01***	0.00	0.02***	0.02***	0.00***	0.03***	0.02***	0.00	0.01***	0.01***	0.01***	0.07***	0.01***	0.01***	0.02***	0.02***	0.01***	0.03***	0.03***
Var (Level 2: schools)	0.71***	0.62***	0.72***	0.75***	0.63***	0.69***	0.68***	0.68***	0.71***	0.68***	0.64***	0.70***	0.70***	0.68***	0.68***	0.73***	0.69***	0.73***	0.73***	0.73***	0.74***	0.63***	0.70***
F model	1.70**	2.24***	3.09***	4.25***	3.02***	3.23***	2.05***	4.68***	6.03***	3.24***	2.93***	3.74***	5.70***	1.40*	1.68**	1.62**	3.96***	1.93***	2.95***	9.49***	2.49***	1.02	5.88***
Number of teachers	2,931	2,315	3,759	1,656	2,926	1,884	2,235	4,154	3,676	3,658	4,011	3,976	3,252	3,015	2,094	2,046	7,407	2,782	3,952	8,648	2,560	3,825	134,518
Number of schools	163	135	195	55	193	116	182	185	200	199	230	198	167	176	132	170	399	180	196	521	165	196	7,992

<sup>a</sup> POLS estimates of the following multilevel model with random intercept:  $\eta_{ij}$  is the cardinalized value of satisfaction for teacher  $i$  in school  $j$ ,  $f_j$  is the proportion of female teachers in school  $j$ ,  $g_{ij}$  is a dummy variable accounting for 1 if teacher  $i$  in school  $j$  is female and zero otherwise,  $h_{ij}$  is an interaction term between teacher gender and the proportion of female teachers in school  $j$ ,  $\beta$  is a vector of personal characteristics,  $\gamma_j$  denotes a vector of school characteristics, and  $\epsilon_{ij}$  and  $\mu_j$  are error terms at the school and teacher level, respectively.

Significance levels: \*\*\* p<0.01; \*\* p<0.05; \* p<0.10; + p<0.20.

Source: Authors' estimates based on the TALIS 2018 international database.