Why don't more boys want to become teachers? The effect of a gendered profession on students' career expectations

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Abstract

We investigated gender differences in teaching career expectations among 15-year-old students in 49 countries participating in the 2015 cycle of the Programme for International Student Assessment (PISA). Results revealed that boys were generally less likely than girls to expect to work as teachers, but the magnitude of the gender gap varied across countries. Boys were more likely to expect to work as teachers in countries with a greater representation of male teachers and in countries with higher teacher salaries. In countries with more egalitarian gender beliefs (measured by attitudes toward gender equality in contribution to household income), both boys and girls were less likely to expect teaching careers, but this negative association was stronger for boys than for girls.

Keywords: teaching career expectations; underrepresentation of male teachers; socialisation of occupational preferences; cross-national variations; PISA.

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INTRODUCTION

According to the Organisation for Economic Co-operation and Development, more than two-thirds of teachers from all levels of education are women (OECD, 2019). The proportion of female teachers decreases as the level of education increases: women make up 97% of teachers at pre-primary level, 83% at primary, 69% at lower-secondary, 60% at upper-secondary, and only 43% at tertiary levels. Even in Nordic countries, which are typically considered to have high gender equality at home, at work and in public life, teaching is a highly feminised occupation. Moreover, the proportion of female teachers is on the rise (OECD, 2017a). This increased overrepresentation of female teachers – what some have termed the 'feminisation' of the teaching profession (Kelleher et al., 2011) – has become a concern in some countries.

The overrepresentation of female teachers has led some policymakers and parents to argue for an increase in the recruitment of male teachers as a way to 're-masculinise' schools (Mills, Martino, & Lingard, 2004), arguing that the dominance of female teachers has led to a 'feminisation' of the curriculum through the employment of feminine teaching styles and the use of books and topics more pleasing to girls (Gambell & Hunter, 2000). Despite inconsistent empirical evidence that students benefit from teacher-student gender matching (e.g., Cho, 2012), some have argued that this feminisation may have led to boys becoming disengaged from learning, as evidenced in recent years by the underperformance of boys in reading and the negative attitudes towards school (OECD, 2015a). Thus, the drive to recruit more male teachers may promote gender equality in the teaching profession and also help to tackle the underachievement of boys (Carrington, Tymms, & Merrell, 2008).

Few studies have examined factors associated with men's aspirations for a teaching career. Our research aims to fill this gap by investigating the career expectations of boys through an analysis of gender stratification (i.e. inequalities between men and women regarding wealth,

power, and privilege) at societal level and a country's gender ideology about appropriate male and female behaviours within society (i.e. individuals' level of support for a division of paid work and family responsibilities that is based on the belief in gendered separate spheres). We hypothesise that the socialisation of boys' occupational preferences (i.e. boys learn and internalize the norms of society about gender-typed preference for certain occupations during childhood and adolescence) is based on perceived gender imbalances in the labour force, which we argue is underpinned by a culture's gender ideology (Davis & Greenstein, 2009; van der Vleuten, Jaspers, Maas, & van der Lippe, 2016). We argue that due to the dominance of women in the teaching profession, boys are exposed to fewer male teachers. As a result, boys lack male role models who can socialise them to aspire for a teaching career (Moss-Racusin & Johnson, 2016). This reinforces boys' ideas of what occupations are considered typically feminine in their society. That is, gender imbalance in teaching profession can affect sex role socialisation – boys and girls are taught to expect and desire different life outcomes according to their gender and boys. The majority of studies examining teaching career choices focused on pre-service teachers or student teachers and only a few studies investigated school students' teaching career interests (Fray & Gore, 2018; Šorgo et al., 2018). These studies have shown that boys are less likely than girls to expect to become a teacher, and these boys expecting a teaching career in high school years are very persistent in their study choice of teacher education (Frei, Berweger, & Buschor, 2017; OECD, 2015b). However, little attention has been given to how social norms and structures underpin boys' and girls' interest in teaching. Our study fills this void in the literature by examining the degree to which social, educational and economic factors are associated with gender gaps in students' teaching career expectations.

LITERATURE REVIEW

The Experiences and Motivations of Male Teachers

The reasons that lead men to choose careers in teaching are generally similar to women's, although some differences have been observed (Thornton, Bricheno, & Reid, 2002). Both genders report that altruistic aspects of teaching such as making a contribution to society, helping children flourish, and imparting knowledge are key drivers. However, men rank extrinsic motivators, such as salary, as more influential than intrinsic motivators (Konrad, Ritchie, Lieb, & Corrigall, 2000). Male teachers report that men do not enter the teaching profession because it is perceived to have low prestige: teaching is not well-respected by parents and is considered an easy job requiring only average intelligence (Cushman, 2005). Men may be underrepresented because teaching is associated with mothering and caring which are stereotypically feminine skills, and professions requiring feminine skills tend to be socially devalued (Skelton, 2009). Male teachers report feeling that they are under constant and heightened scrutiny because they work with children and fear allegations of child abuse or sexual harassment (Cushman, 2005; Sargent, 2000). Indeed, Moss-Racusin and Johnson (2016) showed that male applicants to a teaching position were rated as potentially higher safety threats than equally-qualified women.

One innovative framework for investigating teaching career motivations is the Factors that Influence Teaching (FIT)-Choice model (Watt & Richardson, 2012; Watt et al., 2012). This model predicts that the choice of becoming a teacher results from: socialisation influences (e.g., prior teaching), self-perceptions of teaching ability, intrinsic value (interest and enjoyment of teaching), personal utility value (job security and time for family), social utility value, task demand (level of expertise required and working conditions), task returns (salary and social status), and whether becoming a teacher is a 'fallback' choice. Although Watt and Richardson (2008) report that gender was not a significant factor in decisions to persist or disengage from

teaching, gender differences may still be present in career expectations rather than retention processes. The relevance of different factors for expecting to work as teachers for men and women may also differ. The FIT-Choice instrument was validated with samples of student teachers across several countries (Watt & Richardson, 2012).

The model predicts that prior socialisation experiences could be a factor in the decision to become a teacher. In expanding on the concept of socialisation, the wider social environment, such as how men and women are stratified in a society's workforce, itself a result of a culture's gender ideology, may play a significant role in the formation of occupational aspirations.

Teacher salaries

Teacher salaries tend to be low relative to other professions that require similar levels of educational qualifications, especially for men (OECD, 2017a). Across OECD countries, primary school teachers earn 85% of the salary of a tertiary-educated 25- to 64-year-old full-time, year round worker; lower secondary teachers are paid 88% of that benchmark, and upper-secondary teachers earn 94% of that benchmark salary (OECD, 2017a).

Only a few studies have examined the role of salaries to explain gender differences in teaching career choice among high school students. Park and Byun (2015), who investigated teaching career expectations among high school students in 23 OECD countries, reported no gender differences in the association between salaries and teaching career expectations, a finding mirrored by research conducted in the USA (Bacolod, 2007), Australia (Richardson & Watt, 2005), and Northern Ireland (Moran, Kilpatrick, Abbott, Dallat, & McClune, 2001). Other research suggests that lower pay may discourage men from pursuing a career in teaching in New Zealand (Cushman, 2005), the USA (Han & Rossmiller, 2004), and Australia (Stokes, 2007).

The Socialisation of Occupational Preferences

The Social Cognitive Career Theory (SCCT) posits a mutually influencing relationship between an individual and their environment (Lent, 2005). As an individual interacts with their social environment (parents, peers, teachers, school, media and the wider social environment), aspects such as social and cultural beliefs, barriers, and facilitators exert their influence on the process of career preference development. The social environment also conveys a society's beliefs and attitudes about what is "appropriate" male or female behaviour (Davis & Greenstein, 2009; Leung, 2008; Leuze & Helbig, 2015; van der Vleuten et al., 2016), through which children begin to form their gender ideologies exhibiting as gender role expectations and stereotypes. Gender ideology refers to an individual's underlying attitudes and beliefs regarding the appropriate roles and responsibilities of men and women in society. In a research review on the causes and consequences of gender ideology, Davis and Greenstein (2009) report that gender ideology formation is influenced by social and demographic factors, such as parental ideologies, socialisation, and role modelling (by parents and others), as well as individuals' vested interests.

Gender ideology thus acts as a lens through which individuals view their social world and influences the decisions adolescents make about their educational and employment aspirations (Leuze & Helbig, 2015; van der Vleuten et al., 2016). As a result, the distribution of men and women in the labour force reflects a culture's gender ideology about appropriate male and female occupations. The overrepresentation of one gender in certain occupations reinforces children's ideas about what is considered typically feminine and masculine behaviour, which in turn underpins expected gender role patterns (van der Vleuten et al., 2016). The more an occupation is dominated by women, the more it becomes socially identified as a "female" occupation at societal level, and the more likely it will be perceived as female appropriate by young people, and vice versa. Indeed, research has shown that gender stereotypes affect

individuals' career choice decisions (Gadassi & Gati, 2009). Leuze and Helbig (2015), who investigated high school students' occupational expectations in 29 countries, reported that students showed stronger gender-typical occupational expectations in countries with larger occupational gender differentiation.

Social pressures for gender differentiation are stronger for boys than for girls (Bussey & Bandura, 1999; Leuze & Helbig, 2015) and boys' gender role expectations are stricter and more salient than they are for girls (Warrington, Younger, & Williams, 2000). Girls are more willing to pursue non-stereotypical activities and occupations than boys would be willing to pursue stereotypically "feminine" activities and occupations. According to gender socialisation theories, adolescents are still shaping their gender identity and tend to conform to expected gender roles because doing so confirms their identity (van der Vleuten et al., 2016). The social pressure for a masculine identity and stricter role expectations may prevent boys from pursuing a stereotypically feminine career like teaching (van der Vleuten et al., 2016). This socialisation can result in the underrepresentation of male teachers which means boys lack role models who can socialise them to aspire for a career in teaching (Moss-Racusin & Johnson, 2016).

This is especially problematic for boys in the primary years, where male teachers are most underrepresented, and where positive role models shape children's subsequent gender stereotypes (Dasgupta & Asgari, 2004). Studies examining when individuals decide to become teachers suggest that decisions can usually be traced back to the middle school years (Lee, Clery, & Presley, 2001). In adolescence, boys and girls are exploring and making preliminary decisions about which careers are attractive to them (Super, 1980; Xu & Tracey, 2016). Adolescent students have developed a stable pattern of career interests (Xu & Tracey, 2016), as well as an understanding of the femininity or masculinity of jobs (Gottfredson, 1981; Hartung, Porfeli, &

Vondracek, 2005). Through a process of elimination of unrealistic occupational preferences, adolescents develop a set of occupational alternatives that are congruent with their interests, abilities, and gender role expectations (Gottfredson, 1981).

The Present Study

This study explores whether the underrepresentation of men in the teaching profession is discouraging boys from pursuing a career in teaching by investigating two factors that may lead to men's underrepresentation: gender stratification (i.e. inequalities between men and women) in the labour force and a society's gender ideology (i.e. individuals' level of support for a division of paid work and family responsibilities that is based on the belief in gendered separate spheres). We conduct empirical cross-country analyses of the career expectations of 15-year-old boys and girls to examine the extent to which between-country differences in the share of male teachers and beliefs in gender egalitarianism (i.e. beliefs and attitudes toward gender equality) are associated with between-country differences in boys' and girls' expectations for a future career in the teaching profession. Consistent with the literature on gender ideology and the socialisation of occupational preferences, we hypothesise that in countries where the share of male teachers is lower and holding less egalitarian gender beliefs, boys will be less likely to encounter male role models as teachers than in countries with less skewed gender ratios and more gender egalitarianism. As a result, boys will perceive teaching to embody feminine gender role stereotypes. We therefore expect that boys, for whom gender role expectations are stricter and social pressures for gender differentiation are stronger, will be less likely to choose to pursue a stereotypically feminine career like teaching in order to avoid violating gender stereotypes.

However, we expect the gender gap in teaching career expectations to vary systematically across countries based on the extent of between-country differences in the size of the gender imbalance in the teaching workforce and societal-level gender ideology (measured by the percentage of individuals in each country who either agree or strongly agree with the statement that "Both men and women should contribute to household income). Our second hypothesis is that countries with greater underrepresentation of men in the teaching workforce and less egalitarian beliefs will be associated with larger gender gaps in teaching career expectations. We therefore predict lower proportions of boys aspiring to become teachers in countries with a larger share of female teachers and holding less egalitarian beliefs. We do not make any *a priori* hypotheses about whether girls' expectations for a teaching career will be more or less negatively associated with teaching being a more or less female-dominated occupation. As girls hold less stereotypical gender ideologies (Warrington et al., 2000), they may prefer to work in fields that are not highly segregated by gender.

We also hypothesise that higher teacher salaries will be associated with a higher proportion of students (both boys and girls) aspiring to become teachers. However, we hypothesise that boys will be more sensitive to economic incentives than girls, and therefore predict a smaller gender gap in teaching career expectations in countries with higher teacher salaries.

Our study contributes to research on career expectations in several important ways. Most cross-national studies that have investigated gender differences in occupational expectations have focused on science, technology, engineering and mathematics (STEM) careers and women's underrepresentation in such fields (Sikora & Pokropek, 2012). While this literature examines the factors associated with the perpetuation of a prevalence of boys opting for careers

in traditionally male-dominated fields of study and work, little is known about the factors that contribute to boys' preferences for female-dominated fields of study and work, such as teaching. Additionally, cross-national studies on teaching career aspirations and choices looked at college students, particularly those who are already enrolled in teacher education programs (Fray & Gore, 2018), and focused on comparisons across a small *ad hoc* selection of countries rather than examining between-country variations across multiple settings.

DATA AND METHODS

Data come from 49 countries that participated in the 2015 edition of the OECD Programme for International Assessment (PISA), a triennial large-scale international survey that measures the knowledge and skills of representative samples of 15-year-old students. The PISA 2015 data set was the most recent edition of PISA at the time of data analysis that contains information on students' career expectations. See Appendix A for information on the PISA study, technical standards, and the modelling strategy we adopted.

The dependent variable is binary, indicating whether or not students expected a teaching career. This was obtained from the PISA 2015 student questionnaire, which included a single open-ended question: "What kind of job do you expect to have when you are about 30 years old?" See Appendix A for details on variable construction.

The main independent variables are country-level indicators of the share of men in the teaching profession, societal-level beliefs in gender egalitarianism (as a measure of gender ideology), and teacher salaries. The share of men in the teaching profession was calculated as the percentage of male teachers in lower-secondary schools (OECD, 2016a). We focused on lower-secondary institutions because in many countries this is when students are called to make

decisions about continuing their studies into the tertiary sector and/or are channelled into different programs based on their academic results (OECD, 2016b). Gender egalitarianism was measured by the percentage of individuals in each country who either agree or strongly agree with the statement that "Both men and women should contribute to household income." Higher percentages represent more egalitarian beliefs. Data are from the International Social Survey Programme (ISSP) 2012, a nationally representative survey that collects information about family and changing gender roles among the adult population. Teacher salary was calculated as the ratio of the salary of a teacher in lower-secondary school with 15 years of experience relative to gross domestic product (GDP) per capita (OECD, 2016b).[1]

PISA sample selectivity and GDP per capita were used as country-level control variables (see Appendix A for details). At student level, we controlled for gender, family socio-economic status (SES), whether the student's father or mother were employed in the teaching profession,[2] as well as students' performance in math, reading, and science through PISA scores. At school level, we controlled for the school's socio-economic composition through an indicator of mean SES.

To investigate students' teaching career expectations, we estimated binomial logistic regression models for each country after controlling for individual- and school-level variables. Logistic regressions were run separately on the whole sample of students and the subsample who expected to work in professional occupations (teaching and non-teaching professions). The subsample analyses enable us to control for the potential role that educational aspirations and ambition play in shaping students' expectations to work as teachers. Descriptive statistics and logistic regression results were calculated using balanced replication weights (BRR) to take into account the clustered nature of PISA data (students nested within schools) and obtain unbiased

estimates for standard errors (OECD, 2017b). We used STATA 15 for descriptive statistics and binomial logistic regression.

To investigate the degree to which gender gaps in teaching career expectations vary by country-level social, economic, and educational contexts, we ran a series of three-level hierarchical generalised linear models (HGLMs) in which students (level 1) are nested within schools (level 2) and within countries (level 3).[3] Because the dependent variable is binary, this study employs HGLMs in which the level 1 sampling model is a Bernoulli distribution. Recent work has questioned the appropriateness of logistic transformation to conduct group-level comparisons and comparisons across models when variables are dichotomous, suggesting of linear probability models (LPMs) or average marginal effects (AMEs) as more appropriate alternatives (Mood, 2010). However, this does not apply when observed probabilities are very low (our case) or very high. We chose to report odds ratios but run robustness checks to identify the sensitivity of our results to alternative modelling strategies. Neither main effects nor interaction effects differed substantively in size when considering LPMs or AMEs, however interaction effects were not statistically significant at conventional levels (5%) in these alternative specifications. Senate weights were used to ensure that each country contributes equally to analyses (OECD, 2017b).

HGLMs allow us to understand whether gender gaps in teaching career expectations differ depending on country-level variables through so-called cross-level interaction effects. We report results from three sets of models. In Model 1 we examine the cross-level interaction between the boy dummy (level 1) and the share of men in the teaching profession. In Model 2 we introduce the cross-level interaction between the boy dummy (level 1) and the country-level measure of beliefs in gender egalitarianism. In Model 3 we introduce the cross-level interaction

between the boy dummy (level 1) and the country-level teacher salaries. Note that HGLM models were run on the pooled sample of students from 30 countries that have complete information on the three country-level variables. Due to the small sample sizes and correlations between country-level variables (see Appendix B), separate HGLMs were run for each of the three country-level variables. We used HLM 7. Analyses take into account missing values through imputations by chained equation (ICE) procedures in STATA 15 (Royston, 2004).

RESULTS

Table 1 shows the percentages of boys and girls who aspire to work as teachers. Boys were less likely than girls to do so (2.7% of boys and 5.9% of girls). In Ireland, there is the largest gender gap in teaching career expectations (10.18%, effect size=.32). It is followed by Croatia (7.53%, effect size=.30), Montenegro (7.11%, effect size=.29), Uruguay (5.70%, effect size=.27), and Austria (5.89%, effect size=.26).

Table 1

Table 2 presents the change in the likelihood that boys expect to work as teachers, controlling for individual- and school-level characteristics. In Australia, for example, boys are less likely than girls to expect to work as teachers by 71%, even when boys and girls have similar individual and school characteristics. In most countries, boys were significantly less likely than girls to expect to have a teaching career. The size of the gender gap in teaching career expectations varied significantly across countries. For example, in Japan, there is no gender

difference in the likelihood of expecting to work as teachers, whereas in Jordan boys are less likely than girls to expect to work as teachers by 95%.

Table 2

Table 3 shows how student-, school-, and country-level characteristics are associated with students' teaching expectations. Model 1 (see Table 3) revealed that when a mother is in the teaching profession, both boys and girls are approximately 68% more likely to expect to work as teachers (β = .523, *OR* = 1.687, $p < .001$). When a father is in the teaching profession, girls are 77% more likely to expect to work as teachers (β = .573, *OR* = 1.773, $p < .001$) and boys are 2.5 times more likely to expect to work as teachers (β = .573 + .359, *OR* = 2.539, $p < .10$).

Table 3

In Model 1 in Table 3 we include the cross-level interaction term between boy (level 1) and the share of men in the teaching profession (level 3) to examine if gender gaps in teaching profession are associated with the share of men in the teaching profession. Model 1 revealed that the share of male teachers in the teaching profession is positively associated with both boys' and girls' teaching career expectations. For girls, a one standard deviation (i.e., 11%) increase in the share of male teachers is associated with a 29% increase in the odds of expecting to have a teaching career (β = .257, *OR* = 1.293, $p < .10$). For boys, a one standard deviation increase in the share of male teachers is associated with a 51% increase in the odds of expecting to have a teaching career (β = .257 + .152, *OR* = 1. 505, $p < .01$). This indicates that both boys and girls are more likely to expect a career in teaching in countries where the share of male teachers is

higher, but this positive association is stronger for boys than for girls, leading to smaller gender gaps in teaching career expectations.

In Model 2 we include the cross-level interaction term between boy and beliefs in gender egalitarianism to investigate if gender gaps in teaching profession are associated with beliefs in gender egalitarianism. Model 2 revealed that a higher level of gender egalitarian beliefs is negatively associated with both boys' and girls' teaching career expectations. However, this negative association is stronger for boys than for girls. For girls, a one standard deviation (i.e., 12%) increase in the percentage of adults who agree that both men and women should contribute to household income is associated with a 15% decrease in the odds of expecting to have a teaching career (β = –.169, OR = .845, $p < .05$), while for boys a one standard deviation increase in gender egalitarian beliefs is associated with a 29% decrease in the odds of expecting to have a teaching career (β = –.169 –.178, OR = .707, $p < .05$). These findings indicate that there are larger gender gaps in teaching career expectations in countries with higher levels of gender egalitarian beliefs.

In Model 3 we include the cross-level interaction term between boy and teacher salaries to examine if gender gaps in teaching career expectations are associated with teacher salaries. Model 3 revealed that in countries where teacher salaries are higher, both boys and girls are more likely to expect to work as teachers. This positive association is stronger for boys than for girls. For girls, a one standard deviation increase in teacher salaries is associated with a 60% increase in the odds of expecting to become a teacher (β = .471, OR = 1.601, $p < .001$). For boys, a one standard deviation increase in teacher salaries is associated with an increase of almost twice the odds of expecting to become a teacher (β = .471 + .261, OR = 2.078, $p < .001$). These findings indicate that the gender gap in teaching career expectations is smaller in countries where teacher

salaries are higher. For example, in countries with high teacher salaries such as Brazil and Hong Kong, gender gaps in teaching career expectations are small. In countries with low teacher salaries such as the Slovak Republic and Uruguay, gender gaps in teaching career expectations are substantial. However, in some countries such as Iceland and Hungary, teacher salaries did not explain gender gaps in teaching career expectations.

To check the robustness of findings, we ran descriptive statistics, logistic regressions, and HGLM analyses among the subsample of students who reported expecting to work in a professional occupation. Results (see Appendices E, F, and G) are consistent with those presented in Table 3.

DISCUSSION AND CONCLUSIONS

Several comparative studies have documented national trends in the gender distribution of the teaching workforce (Kelleher et al., 2011), but little attention has been given to gender differences in high school students' teaching career expectations and which structural features of societal and economic contexts play a role in predicting gender differences (Fray & Gore, 2018). Previous research identified the role played by education and social systems in shaping teaching career expectations (Park & Byun, 2015, Authors). Results showed that boys are less likely to expect to work as teachers and gender gaps in teaching career expectations vary across countries. However, because the focus was not on explaining between-country differences in gender gaps, they ignored the lack of same-sex role models and gender ideology, key factors in explaining girls' underrepresentation in STEM careers.

The current study fills this void by investigating cross-national differences in teaching career expectations and country-level features of economic (i.e., teacher salary), social (i.e.,

gender ideology), and educational contexts (i.e., underrepresentation of male teachers) that may be associated with such differences. Consistent with our hypothesis and prior research (Park & Byun, 2015, Authors), our results reveal that boys are generally less likely than girls to expect to have a teaching career, even when controlling for individual-, school-, and country-level factors. Consistent with our first hypothesis, in countries where the share of male teachers is lower, boys are less likely to report teaching career expectations. In support of prior research (Park & Byun, 2015, Authors), our results also indicate that the magnitude of the gender gap in teaching career expectations varies across countries. Gender gaps are smaller in countries with a greater proportion of male teachers, supporting our second hypothesis. These findings suggest that the overrepresentation of women might discourage boys from entering the teaching profession.

However, contrary to our expectations, gender gaps are larger in countries holding more egalitarian gender beliefs, or less traditional gender ideologies. Our results reveal that in countries with more egalitarian beliefs, boys as well as girls are less likely to aspire to a teaching career, with a stronger negative association for boys. This is consistent with Leuze and Helbig (2015) who reported that girls and boys living in countries with a more progressive gender ideology did not show more gender atypical occupational expectations and that boys tended to prefer occupations with a lower share of women. Others have likewise reported that men are less likely than women to hold non-traditional gender ideologies (Davis & Greenstein, 2009; Leuze & Helbig, 2015; van der Vleuten et al., 2016) and that men show a slower pace of gender ideology change (Ciabattari, 2001).

Finally, we examined if teacher salaries act as economic incentives in the decision to become a teacher. Consistent with our third hypothesis, findings indicate that both boys and girls are more likely to expect to work as teachers when teacher salaries are higher and that boys are

more sensitive to this external motivator than girls. On average across OECD countries, primary school teachers earn 85% of the salary of a tertiary-educated, 25-64 year-old, full-time, full-year worker; lower secondary teachers are paid 88% of that benchmark salary; and upper secondary teachers are paid 94% of that benchmark salary (OECD, 2017a). Our findings also suggest that raising teacher salaries might improve the overall supply of teachers and help to alter the gender ratio in the teaching profession. To improve gender imbalance in the teaching profession, policymakers should pay attention to low teacher salaries compared to other professions.

Our research shows that gender imbalances in the career expectations among 15-year-olds may have long-term consequences on gender representation in the teaching profession and the extent to which it will reflect the demographic profile of the student body (OECD, 2018). Unless explicit policy interventions are put in place, the current underrepresentation of men is likely to lead students, particularly boys, to view teaching as an unattractive career option, resulting in even greater gender imbalances in the teacher profession. Recruiting more male teachers could help adjust the increasing gender imbalance and provide counter-stereotypic teacher figures to play a positive role on boys' gender ideology. Additionally, male teachers can serve as role models to foster positive attitudes to engage boys in learning and thus improve academic achievement (Cushman, 2005, 2010). Our results indicate that boys are more likely to prefer teaching careers if their fathers work in teaching, suggesting that boys' career decisions are influenced by a same-sex role model. A similar strategy to encourage more women into STEM careers has been to present girls to female role models in these typically male-dominated fields (Carrell, Page, & West, 2010).

The finding that a lack of male teachers is associated with fewer students expecting to work as teachers and wide gender gaps in teaching expectations paints a bleak picture for the

teaching profession. Goldin (2006) maps how in the twentieth century, as women's role in the labour market came to be established, an increasingly smaller proportion of educated women opted for a career in teaching and nursing while an increasing proportion opted for a career as doctors, lawyers, and managers. Our findings suggest that, the teaching jobs left vacant by these "missing women" are unlikely to be filled by men and, as women's opportunities in the labour market increase, in the absence of policy changes, the result is likely to be a shortage of teachers, rather than greater gender equity. Therefore, it is particularly important to address the factors that are associated with the first stages of leaky pipelines, not only of females in STEM careers but also of males in the teaching profession.

In addition to student gender, our study found that several individual background characteristics are associated with students' teaching career expectations. Family SES appears to be negatively associated with students' teaching career expectations. Results also indicate that high-achieving students are more likely than low-achieving students to expect to work as a teacher. In particular, when students have similar math and science achievement scores, high-achieving students in reading are more likely to expect to work as a teacher. In recent years, many countries have lamented a shortage of teachers overall, and in particular of teachers with high academic potential in science and mathematics (Moin, Dorfield, & Schunn, 2005; Schleicher, 2012). Prior research has shown that classroom experiences that students had teachers and their teaching practices in STEM subjects are not associated with students' teaching career expectations (Šorgo et al., 2018). Future research is needed to examine whether classroom experiences in STEM and non-STEM subjects (e.g., Humanities and Social Sciences) are associated with these high-achieving students' teaching career expectations.

Our study has the limitations of all cross-sectional studies: results presented are based on a single wave of cross-sectional cross-national data and therefore do not imply causal relationships. Because our study focused on a limited aspect of teachers' salaries and men's current representation in the teaching workforce, these findings should be interpreted with caution. Because of data constraints, the current study did not take into account gender gaps in teacher salaries. Additionally, the current study did not differentiate primary education from secondary education because of data issues (see Appendix C). More research is thus needed to examine whether the association between teacher salaries, gender stratification in the teaching workforce, and teaching career expectations varies by level of education.

NOTE

[1] While we recognise that the ratio of teachers' salaries to the salaries of other non-teaching professionals that require a BA degree or above would better reflect the competitiveness of teacher salaries, data on non-teaching professions requiring a tertiary degree are not available for several PISA 2015 participating countries.

[2] The ISCO-08 classification was used to code students' and parents' occupations, and the coding scheme employed for the dependent variable was also used to code for parents who were employed in the teaching profession (see Appendix A).

[3] To take into account plausible values in HGLM analyses when considering academic performance as control variables, we ran the models 10 times using each plausible value and then combined estimates as per PISA procedures.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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Table 1. Percentage of 15-year-old Boys and Girls Who Expect to Work in the Teaching Profession, by Gender

	Boys		Girls		Difference (G-B)			Effect size
	%	Standard Error	%	Standard Error	%		Standard Error	Cohen's *d*
Ireland	6.74	(0.60)	16.92	(0.82)	10.18	***	(0.94)	0.32
Croatia	2.74	(0.38)	10.27	(0.66)	7.53	***	(0.69)	0.30
Montenegro	3.35	(0.31)	10.46	(0.54)	7.11	***	(0.60)	0.29

Uruguay	1.89	(0.28)	7.59	(0.53)	5.70	***	(0.55)	0.27
Austria	2.30	(0.31)	8.19	(0.69)	5.89	***	(0.73)	0.26
Thailand	5.19	(0.49)	13.97	(0.87)	8.78	***	(1.07)	0.25
Switzerland	3.11	(0.38)	9.08	(0.86)	5.97	***	(0.89)	0.25
Slovenia	2.16	(0.33)	6.78	(0.53)	4.61	***	(0.61)	0.25
Australia	2.87	(0.21)	8.62	(0.46)	5.75	***	(0.47)	0.24
Slovak Republic	0.88	(0.16)	5.05	(0.82)	4.17	***	(0.79)	0.23
New Zealand	1.19	(0.24)	4.85	(0.50)	3.66	***	(0.55)	0.21
Czech Republic	1.48	(0.22)	5.20	(0.65)	3.72	***	(0.67)	0.20
Luxembourg	6.94	(0.41)	12.63	(0.58)	5.69	***	(0.71)	0.19
Greece	3.85	(0.51)	8.05	(0.63)	4.19	***	(0.69)	0.19
Italy	1.13	(0.22)	5.22	(0.39)	4.09	***	(0.44)	0.19
Germany	1.91	(0.33)	5.24	(0.42)	3.33	***	(0.50)	0.19
Israel	3.01	(0.57)	6.72	(0.58)	3.70	***	(0.68)	0.18
Finland	2.84	(0.34)	6.50	(0.51)	3.66	***	(0.57)	0.18
France	2.11	(0.30)	5.44	(0.43)	3.33	***	(0.51)	0.18
United Kingdom	3.69	(0.45)	6.30	(0.42)	2.61	***	(0.61)	0.18
Mexico	2.41	(0.35)	5.88	(0.49)	3.47	***	(0.57)	0.16
USA	1.42	(0.23)	4.22	(0.45)	2.80	***	(0.54)	0.16
Poland	1.19	(0.24)	3.72	(0.46)	2.53	***	(0.48)	0.16
Turkey	3.86	(0.44)	7.37	(0.60)	3.51	***	(0.63)	0.15
Romania	2.46	(0.37)	5.44	(0.67)	2.97	***	(0.74)	0.15
Norway	1.80	(0.28)	4.71	(0.58)	2.91	***	(0.56)	0.15
Bulgaria	0.72	(0.16)	2.59	(0.37)	1.87	***	(0.43)	0.15
Lithuania	0.87	(0.17)	2.66	(0.37)	1.79	***	(0.39)	0.15

Jordan	0.14	(0.07)	1.75	(0.65)	1.61	*	(0.65)	0.15
Spain	4.14	(0.38)	7.13	(0.51)	3.00	***	(0.66)	0.14
Netherland	3.55	(0.50)	6.25	(0.45)	2.70	***	(0.66)	0.14
Hungary	1.16	(0.22)	3.09	(0.40)	1.93	***	(0.44)	0.14
Canada	0.37	(0.11)	1.71	(0.21)	1.33	***	(0.23)	0.14
Latvia	0.17	(0.11)	1.44	(0.24)	1.27	***	(0.26)	0.14
Chile	1.70	(0.28)	3.78	(0.37)	2.08	***	(0.42)	0.13
Estonia	0.68	(0.21)	2.13	(0.30)	1.46	***	(0.37)	0.13
Tunisia	9.71	(0.98)	13.45	(0.81)	3.74	***	(1.15)	0.12
Macao	6.64	(0.55)	9.76	(0.64)	3.12	***	(0.95)	0.11
Korea	9.18	(0.56)	12.33	(0.73)	3.15	***	(0.90)	0.09
Singapore	3.49	(0.41)	5.35	(0.46)	1.85	**	(0.66)	0.09
Peru	0.81	(0.19)	1.94	(0.27)	1.13	***	(0.29)	0.09
Denmark	0.71	(0.17)	1.64	(0.28)	0.94	**	(0.31)	0.08
Sweden	1.11	(0.25)	1.96	(0.27)	0.85	*	(0.35)	0.08
Brazil	1.65	(0.20)	3.05	(0.31)	1.40	***	(0.32)	0.07
Belgium	4.00	(0.56)	4.94	(0.71)	0.94		(0.93)	0.06
Hong Kong	6.15	(0.63)	7.02	(0.58)	0.87		(0.83)	0.06
Iceland	1.81	(0.37)	2.36	(0.41)	0.54		(0.53)	0.04
Portugal	1.34	(0.26)	1.29	(0.25)	-0.05		(0.35)	0.01
Japan	7.36	(0.59)	6.14	(0.51)	-1.22		(0.80)	-0.05

***$p \leq .001$, **$p \leq .01$, *$p \leq .05$

Table 2. Coefficients for the Logistic Regression for Boys Expecting to Have a Teaching Career

	Odds Ratio (Boy)	
Australia	0.313	***
Austria	0.332	***
Belgium	0.785	
Bulgaria	0.247	***
Brazil	0.506	***
Canada	0.236	***
Switzerland	0.313	***
Chile	0.457	***
Colombia	1.118	
Czech Republic	0.267	***
Germany	0.334	***
Denmark	0.386	**
Spain	0.600	***
Estonia	0.269	***
Finland	0.441	***
France	0.401	***
United Kingdom	0.621	***
Greece	0.447	***
Hong Kong	0.935	
Croatia	0.295	***
Hungary	0.374	***
Indonesia	0.324	
Ireland	0.369	***
Iceland	0.750	
Israel	0.412	***
Italy	0.248	***
Jordan	0.054	***
Japan	1.207	
Korea	0.751	**
Lithuania	0.338	***
Luxembourg	0.560	***
Latvia	0.060	***
Macao	0.640	**
Mexico	0.399	***
Montenegro	0.269	***
Netherland	0.560	***
Norway	0.385	***
New Zealand	0.249	***
Peru	0.409	***
Poland	0.285	***

Portugal	0.947	
Romania	0.455	***
Singapore	0.647	*
Slovak Republic	0.186	***
Slovenia	0.376	***
Sweden	0.552	*
Thailand	0.354	***
Tunisia	0.721	*
Turkey	0.499	***
Uruguay	0.257	***
USA	0.336	***

Note. The odds ratio (*Boy)* presents the change in the likelihood that boys expect to work as teachers, controlling for family socioeconomic status, having parents who work as teachers, academic ability in reading, math and science, and the school's socio-economic composition.
***$p \leq .001$, **$p \leq .01$, * $p \leq .05$

Table 3. Results of Hierarchical Bernoulli Logit Models to Explain Variation in Expectations for the Teaching Profession

	Model 1			Model 2			Model 3		
	Odds Ratio		Standard Error	Odds Ratio		Standard Error	Odds Ratio		Standard Error
Intercept	0.048	***	0.086	0.049	***	0.086	0.054	***	0.088
Individual level:									
Boy	0.434	***	0.066	0.445	***	0.058	0.415	***	0.056
Family SES	0.902	***	0.030	0.902	***	0.029	0.903	***	0.025
Mother in the teaching profession	1.687	***	0.092	1.685	***	0.090	1.643	***	0.083
Father in the teaching profession	1.773	***	0.125	1.781	***	0.125	1.763	***	0.115
Reading literacy score	1.100	*	0.047	1.100	*	0.046	1.099	*	0.045
Math literacy score	1.055		0.052	1.056		0.051	1.083	†	0.048
Science literacy score	0.981		0.045	0.981		0.044	0.950		0.053
Individual-level interactions:									
Boy x Mother in teaching	1.060		0.127	1.057		0.123	1.060		0.113
Boy x Father in teaching	1.432	†	0.196	1.425	†	0.195	1.420	*	0.175
School level:									
School mean SES	1.034		0.100	1.031		0.101	1.013		0.083
Country level:									
PISA sample selectivity	1.011		0.014	1.000		0.012	1.028	*	0.012
Log of GDP per capita	0.900		0.339	0.869		0.367	0.806	**	0.067
Share of male teachers in lower-secondary education	1.293	**	0.077						
Gender egalitarianism: Husband and wife should contribute to income				0.845	*	0.079			
Teacher salaries relative to GDP per capita in lower-secondary education							1.601	***	0.118
Cross-level interactions:									
Boy x male teachers	1.164	**	0.054						
Boy x gender egalitarianism				0.837	*	0.066			
Boy x teacher salary							1.298	***	0.072

N			
Student (unit of observation)	210114	210114	210114
School	8115	8115	8115
Country	30	30	30
Variance components (country level)			
Intercept	0.248 ***	0.287 ***	0.296 ***
Slope of boy	0.088 ***	0.099 ***	0.082 ***

***$p \leq .001$, **$p \leq .01$, *$p \leq .05$, †$p \leq .10$
Population average models with robust standard errors.

Appendix

Appendix A. Detailed information on data, variables, and modelling strategy used in the study

PISA study, technical standards, and the modelling strategy

Since 2000, PISA assesses students' performance in reading, mathematics, and science and a specific subject is assessed in greater depth in each survey wave (reading in 2000 and 2009, mathematics in 2003 and 2012, and science in 2006 and 2015). Several large-scale international student assessment programs collect information on student performance and background characteristics, but PISA is unique because in some editions it also collects information on students' expected occupations and educational attainment. The research reported in this study uses the PISA 2015 dataset, which contains data on students' career expectations. Although 69 countries and education systems participated in PISA 2015, the analytic sample includes 49 countries for descriptive and logistic regression analyses and 30 countries for HGLM analyses. Some countries are excluded from the analyses due to missing data on country-level key independent variables (i.e., teacher salaries, gender egalitarianism and the proportions of males and females in the teaching profession). Albania, Algeria, Argentina, China (Beijing, Shanghai, Jiangsu and Guangdong), Costa Rica, Georgia, Kosovo, Lebanon, the former Yugoslav Republic of Macedonia, Moldova, Russia, Trinidad and Tobago, and Vietnam are excluded because data on average teacher salaries are not available. The United Arab Emirates, the Dominican Republic, Malta, Qatar, and Chinese Taipei are excluded because data on the share of men and women in the teaching profession are not available. The final list of countries that is used to estimate between-country differences in teaching career expectations and their association with teacher salaries, and the underrepresentation of men in the teaching profession is reported in Appendix C.

Variables

Teaching career expectations

To measure students' occupational expectations, the PISA 2015 student questionnaire included a single open-ended question asking: "What kind of job do you expect to have when you are about 30 years old?" Student responses to this open-ended question were manually coded and classified using the International Standard Classification of Occupations, 2008 edition (ISCO-08). Teaching careers are among those professions which require at least a bachelor's degree or above at job entry, a category which includes, in addition to teachers, professionals in physical, mathematics, and engineering sciences, life and health sciences, and other occupations such as business, legal, social science, and related occupations. For our analyses, we include those students who responded as expecting to work as a teacher in general (2300), or specifically primary (2341), secondary (2330), or special education teacher (2352). The coding frame for selecting the teaching categories for analysis was developed independently by each author. Few discrepancies were identified when comparing the coding frames and the reconciliation process was conducted by discussing the independently-identified coding frames with teacher research experts working at the OECD. Prior research on 15-year-olds' teaching career expectations (Park & Byun, 2015) included the following occupations as teaching careers: pre-primary professional teachers that require a bachelor's degree at job entry and teaching associates at pre-primary and primary levels that require a tertiary education (beginning at ages 17-18 and lasting three to four years, but not the equivalent of a bachelor's degree). However, in our study students reporting

that they expected to work as college, university, higher education, pre-primary teachers, or pre-primary or primary associate teachers were excluded. The exclusion was motivated by the different pathways and qualifications required to access these professions and the different conditions, for example salaries, enjoyed by these professions.

PISA sample selectivity

PISA contains representative samples of students between the ages of 15 years and 3 months and 16 years and 2 months who are enrolled in institutions at International Standard Classification of Education (ISCED) level 2 or above. To the extent that different numbers of youngsters in this reference group have dropped out of school or are still in primary education and the fact that such groups may be particularly low-achievers and hold poor occupational prospects, results could reflect PISA's sample selectivity. Therefore, we controlled for PISA sample selectivity by using the share of the weighted number of PISA participating students in the total population of 15-year-olds. On average across OECD countries, about 89% of 15-year-old students were sampled in the PISA 2015 wave. A further robustness check is provided in which we restrict our analyses to the subsample of students who expect to work in professional occupations, arguably the group of students among which students are least likely to have dropped out of education by age 15.

Appendix B. Correlations of country-level key variables

	PISA sample selectivity	GDP per capita	Share of male teachers	Gender egalitarianism	Teacher salary
PISA sample selectivity					
GDP per capita	0.427				
Share of male teachers in lower secondary	-0.233	0.104			
Gender egalitarianism: Both men and women should contribute to household income	0.007	-0.300	-0.515		
Teacher salary in lower secondary	-0.311	-0.026	0.606	-0.264	

Appendix C. Unstandardised Covariate Values, By Country

	Teaching career expectation (% of students)	Primary school teaching career expectation (%)	Secondary school teaching career expectation (%)	Male (%)	Mother in teaching profession (%)	Father in teaching profession (%)	GDP per capita	Gender inequality index (GII)	Primary teacher salary relative to GDP per capita	Lower secondary teacher salary relative to GDP per capita	Upper secondary teacher salary relative to GDP per capita	% of male primary teachers	% of male lower secondary teachers	% of male upper secondary teachers
Tunisia	11.79	2.61	9.16	46.34	17.69	6.80	11436	0.289	—	1.88	1.88	39.99	45.07	60.83
Ireland	11.76	3.66	2.82	51.30	4.89	1.10	49393	0.127	1.17	1.14	1.14	13.10	—	29.00
Korea	10.69	3.29	7.25	52.23	3.22	1.29	33395	0.067	1.42	1.43	1.43	21.40	30.80	50.40
Thailand	10.19	0.02	0.11	43.34	1.54	0.81	16804	0.366	—	1.48	1.48	26.58	27.90	36.87
Luxembourg	9.91	5.17	4.70	49.66	5.57	2.72	98460	0.075	1.10	1.15	1.15	25.50	41.50	51.30
Macao	8.20	0.02	0.26	50.19	2.84	0.98	127051	—	—	0.73	0.73	14.58	37.46	43.16
Montenegro	6.85	1.31	5.54	51.12	5.04	1.96	14656	0.156	—	1.36	1.54	—	37.14	37.14
Japan	6.75	0.46	1.33	50.42	2.85	2.70	36619	0.116	1.35	1.35	1.35	35.20	57.60	70.00
Croatia	6.63	2.08	4.24	48.10	4.07	0.91	20939	0.141	—	1.28	1.28	6.90	24.80	24.80
Hong Kong	6.60	0.11	0.16	50.61	2.94	1.61	55195	—	—	1.63	1.96	22.21	43.96	42.60
Switzerland	6.00	4.88	0.75	52.09	5.80	2.71	59540	0.04	1.34	—	—	18.00	46.10	56.70
Greece	5.93	0.96	4.58	52.03	8.69	4.86	26851	0.119	0.92	0.92	0.92	29.80	34.00	49.30
Australia	5.75	1.34	4.37	50.39	6.88	1.92	45925	0.120	1.25	1.22	1.20	18.70	41.90	41.90
Spain	5.65	0.66	1.16	49.93	3.66	1.91	33629	0.081	1.25	1.40	1.41	24.00	40.80	45.80
Turkey	5.64	0.48	4.67	50.03	1.10	0.68	19788	0.328	1.45	1.52	1.52	41.80	46.80	54.40
Austria	5.24	1.14	0.55	50.47	0.00	0.00	47682	0.078	0.91	0.98	1.06	8.60	28.00	45.40
United Kingdom	5.00	0.17	1.99	50.78	1.96	3.28	40233	0.131	1.15	1.32	1.32	15.90	15.90	39.10
Uruguay	4.94	1.92	2.93	47.59	4.42	1.05	20881	0.284	—	0.74	0.76	—	25.00	34.98
Netherland	4.93	1.70	0.82	49.83	4.66	1.80	48253	0.044	1.11	1.38	1.38	14.10	48.70	48.80
Israel	4.91	0.07	0.03	49.01	12.16	4.13	33703	0.103	0.84	0.89	0.73	14.70	21.10	30.00
Finland	4.62	0.49	1.82	51.76	6.48	2.62	40676	0.056	0.97	1.04	1.13	20.50	27.60	40.60
Belgium	4.47	0.45	3.23	50.80	6.20	2.58	43435	0.073	1.11	1.24	1.59	18.30	36.80	37.70

Slovenia	4.42	0.29	3.90	51.66	5.09	1.59	30403	0.053	1.24	1.29	1.29	3.10	20.50	33.30
Singapore	4.39	0.03	0.02	51.66	4.37	1.00	82515	0.068	—	1.30	1.30	18.77	33.95	34.27
Mexico	4.12	0.39	0.26	50.70	2.35	2.01	17315	0.345	1.63	1.64	2.56	32.40	47.60	52.80
Romania	3.98	0.30	3.59	49.76	3.20	0.96	20348	0.339	—	0.44	0.44	11.90	30.80	30.80
France	3.80	0.86	0.80	49.62	6.64	2.96	39328	0.102	0.87	0.93	0.94	16.90	35.40	45.40
Germany	3.60	0.51	0.14	50.89	3.79	1.56	46401	0.066	1.38	1.53	1.62	13.20	33.90	47.50
Czech Republic	3.31	2.73	0.53	51.34	4.40	0.82	31186	0.129	0.59	0.58	0.58	7.20	23.10	40.80
Norway	3.25	0.23	2.81	50.64	8.11	2.96	65614	0.053	0.67	0.67	0.72	25.20	25.20	47.90
Italy	3.23	0.54	0.71	49.68	5.56	1.02	35463	0.085	0.93	1.01	1.03	4.10	22.10	33.40
New Zealand	3.05	0.74	0.26	50.32	6.09	2.13	37679	0.158	1.13	1.17	1.18	16.20	34.40	40.40
Slovak Republic	2.91	2.72	0.19	51.52	4.99	0.73	28327	0.179	0.59	0.53	0.53	10.00	22.20	27.80
USA	2.84	0.32	0.24	50.02	6.40	1.19	54629	0.203	1.10	0.91	0.97	12.80	33.20	43.00
Chile	2.74	2.15	0.24	50.26	3.05	1.17	22071	0.322	1.18	1.11	1.17	19.00	31.80	44.70
Poland	2.44	2.42	0.02	50.89	6.35	1.30	25262	0.137	0.98	0.87	1.00	14.70	28.40	32.20
Brazil	2.38	0.00	0.01	48.54	3.68	0.66	15893	0.414	—	1.87	2.30	10.40	30.60	40.10
Hungary	2.11	1.02	0.98	50.10	5.64	1.23	25069	0.252	0.77	0.78	0.86	3.00	22.40	35.20
Iceland	2.10	1.82	0.03	48.52	11.08	1.89	43993	0.051	0.74	0.80	0.81	18.20	18.40	46.10
Lithuania	1.76	0.16	0.53	50.75	5.50	0.96	27581	0.121	—	0.52	0.52	2.90	17.64	20.46
Bulgaria	1.61	0.11	1.49	52.77	6.40	0.86	17260	0.223	—	0.85	0.85	5.70	20.80	20.80
Sweden	1.53	1.53	0.00	50.45	7.36	2.27	45297	0.048	0.83	0.84	0.88	22.80	22.90	47.40
Estonia	1.41	0.03	0.40	51.01	5.37	0.72	28140	0.131	0.61	0.68	0.68	8.40	17.90	27.70
Peru	1.37	0.06	0.06	50.24	4.19	3.62	12043	0.385	—	1.00	1.00	32.16	55.27	55.27
Portugal	1.32	0.03	1.26	50.47	6.48	2.14	28760	0.091	1.33	1.35	1.35	20.20	22.20	27.80
Denmark	1.17	0.83	0.34	50.23	7.31	3.18	45537	0.041	1.15	1.17	1.28	30.90	35.70	51.20
Canada	1.06	0.56	0.27	49.93	5.78	1.61	45066	0.098	1.45	1.33	1.34	26.40	26.40	26.40
Jordan	0.97	0.80	0.00	49.51	9.64	2.75	12050	0.478	—	2.15	2.15	36.02	37.69	42.04
Latvia	0.81	0.04	0.77	50.08	5.63	0.61	23548	0.191	—	0.52	0.52	7.20	15.70	19.00

Note. When we differentiate teaching career expectations at primary and secondary levels (the second and the third columns), in 18 countries less than 1% of students reported that they expect to work as primary teachers and in 28 countries less than 1% of students

reported that they expect to work as secondary school teachers. Due to this issue, the current study did not differentiate primary education from secondary education in examining gender gaps in students' teaching career expectations.

Appendix D. Descriptive Statistics of Variables Used in the HGLM analyses

	Mean	Standard Deviation
Outcome Measure		
Teacher career expectation	0.04	0.20
Student Characteristics		
Boy	0.50	0.50
Family socioeconomic status (SES)	-0.05	1.01
Mother has a teaching occupation	0.05	0.22
Father has a teaching occupation	0.02	0.13
Student ability		
Reading	4.91	0.99
Math	4.89	0.94
Science	4.93	0.98
School Characteristics		
School mean SES	-0.08	0.70
National Characteristics		
PISA sample selectivity	87.83	8.72
National Economic Development		
GDP per capita	35338	12842
Gender egalitarianism: Both men and women should contribute to household income	76.42	12.09
Teacher salary relative to GDP per capita		
Lower secondary	1. 06	0.32
Share of male teachers		
Lower secondary	30.02	10.79

Appendix E. Subsample of Students Reporting a Professional Occupation: Percentage of 15-year-old Boys and Girls Who Expect to Work in the Teaching Profession, by Gender

	Subsample (Students reporting a professional occupation)									
	All students		Boys		Girls		Difference (G-B)			Effect size
	%	Standard Error	%	Standard Error	%	Standard Error	%		Standard Error	Cohen's *d*
Austria	10.68	(0.81)	5.28	(0.78)	15	(1.11)	9.72	***	(1.28)	0.31
Ireland	19.18	(0.85)	12.61	(1.07)	24.4	(1.17)	11.73	***	(1.48)	0.3
Croatia	15.83	(0.94)	8.88	(1.19)	19.7	(1.20)	10.8	***	(1.53)	0.28
Germany	9.66	(0.71)	5.52	(0.94)	13.2	(1.02)	7.67	***	(1.36)	0.28
Switzerland	15.63	(1.13)	9.84	(1.09)	19.9	(1.61)	10.04	***	(1.84)	0.27
Slovak Republic	8.44	(1.14)	3.62	(0.65)	11.2	(1.58)	7.59	***	(1.55)	0.25
Uruguay	8.58	(0.57)	4.34	(0.64)	10.9	(0.74)	6.55	***	(0.91)	0.24
Australia	10.02	(0.51)	5.75	(0.43)	13.3	(0.72)	7.55	***	(0.74)	0.23
France	8.58	(0.64)	5.25	(0.77)	11.3	(0.90)	6.02	***	(1.12)	0.22
New Zealand	5.93	(0.54)	2.92	(0.59)	7.86	(0.78)	4.94	***	(0.95)	0.21
Montenegro	14.69	(0.64)	10.29	(0.90)	17.1	(0.82)	6.82	***	(1.18)	0.2
Czech Republic	9.32	(0.84)	5.35	(0.80)	11.9	(1.20)	6.57	***	(1.43)	0.2
Hungary	5.68	(0.64)	3.39	(0.63)	7.68	(0.95)	4.29	***	(1.07)	0.2
Italy	6.63	(0.53)	2.92	(0.58)	8.97	(0.67)	6.05	***	(0.81)	0.19
Slovenia	9.67	(0.71)	6.55	(0.99)	11.5	(0.88)	4.96	***	(1.23)	0.19
Luxembourg	20.03	(0.66)	15.78	(0.87)	23.2	(1.00)	7.42	***	(1.36)	0.18
Netherland	13.57	(0.96)	10.68	(1.44)	15.9	(1.10)	5.23	**	(1.67)	0.17
Mexico	5.63	(0.43)	3.58	(0.51)	7.44	(0.61)	3.86	***	(0.75)	0.16

Jordan	1.47	(0.51)	0.24	(0.13)	2.3	(0.85)	2.06	*	(0.85)	0.16
Romania	7.77	(0.77)	5.59	(0.81)	9.35	(1.13)	3.76	**	(1.32)	0.15
Latvia	1.87	(0.32)	0.56	(0.36)	2.6	(0.43)	2.04	***	(0.54)	0.15
United Kingdom	8.14	(0.50)	7.02	(0.88)	8.98	(0.59)	1.96		(1.09)	0.15
Thailand	25.2	(1.21)	20.81	(1.96)	26.8	(1.49)	5.97	*	(2.51)	0.14
Israel	9.09	(0.81)	6.98	(1.23)	10.4	(0.89)	3.46	**	(1.28)	0.14
USA	4.64	(0.39)	2.83	(0.45)	5.87	(0.62)	3.04	***	(0.82)	0.14
Bulgaria	3.22	(0.38)	1.83	(0.42)	4.2	(0.60)	2.37	**	(0.77)	0.14
Estonia	2.55	(0.33)	1.43	(0.44)	3.38	(0.47)	1.96	**	(0.66)	0.14
Canada	1.52	(0.17)	0.63	(0.18)	2.17	(0.27)	1.55	***	(0.32)	0.14
Finland	12.46	(0.86)	10.06	(1.18)	14	(1.06)	3.93	**	(1.43)	0.13
Lithuania	3.84	(0.45)	2.46	(0.47)	4.7	(0.64)	2.24	**	(0.74)	0.13
Turkey	8.75	(0.73)	6.75	(0.84)	10.3	(0.87)	3.56	***	(0.94)	0.12
Norway	6.95	(0.74)	4.88	(0.76)	8.31	(0.99)	3.43	***	(1.08)	0.12
Greece	9.98	(0.73)	8.26	(1.06)	11.1	(0.83)	2.85	*	(1.17)	0.11
Chile	4.43	(0.39)	3.18	(0.50)	5.38	(0.51)	2.21	***	(0.67)	0.11
Peru	2.02	(0.27)	1.31	(0.31)	2.61	(0.37)	1.3	***	(0.42)	0.09
Macao	16.16	(0.72)	14.58	(1.14)	17.5	(1.15)	2.87		(1.78)	0.08
Spain	9.3	(0.49)	8	(0.70)	10.3	(0.73)	2.25	*	(1.06)	0.08
Poland	6.13	(0.68)	4.66	(0.94)	6.84	(0.83)	2.18		(1.15)	0.08
Singapore	7.31	(0.45)	6.23	(0.72)	8.32	(0.68)	2.09		(1.07)	0.08
Portugal	2.38	(0.34)	2.94	(0.58)	1.98	(0.38)	-0.96		(0.67)	0.06
Denmark	3.54	(0.51)	2.86	(0.65)	3.96	(0.68)	1.09		(0.90)	0.05
Sweden	3.62	(0.44)	3.35	(0.73)	3.8	(0.53)	0.46		(0.88)	0.05

Brazil	3.48	(0.30)	2.9	(0.34)	3.86	(0.39)	0.96	*	(0.45)	0.02
Iceland	3.49	(0.47)	3.79	(0.78)	3.3	(0.57)	-0.49		(0.93)	0.02
Korea	20.36	(0.93)	20.4	(1.34)	20.3	(1.20)	-0.07		(1.73)	0.01
Hong Kong	11.65	(0.71)	12.37	(1.13)	11.1	(0.89)	-1.26		(1.45)	0.01
Belgium	8.73	(0.86)	8.87	(1.20)	8.63	(1.21)	-0.24		(1.70)	0
Tunisia	17.78	(1.01)	18.05	(1.72)	17.6	(1.05)	-0.42		(1.81)	-0.01
Japan	16.3	(1.01)	19.03	(1.59)	14	(1.15)	-5.08	**	(1.85)	-0.13

Note. To check for the robustness of findings in Table 1, we also provide between-country differences in the gender gap in teaching career expectations among students who expect to work in all professional occupations (both teaching and non-teaching occupations). Professional occupations include both teaching and non-teaching occupations. Non-teaching professional occupations include careers in physical, mathematics, and engineering sciences, life and health sciences, as well as business, legal, social science, and related occupations.

***$p \leq .001$, **$p \leq .01$, *$p \leq .05$
SE = Standard Error

Appendix F. Subsample of Students Reporting a Professional Occupation: Coefficients for the Logistic Regression for Boys Expecting to Have a Teaching Career, 2015

	β (Boy)		*Odds Ratio*	*Standard Error*
Australia	-0.879	***	0.415	(0.096)
Austria	-0.936	***	0.392	(0.186)
Belgium	0.077		1.081	(0.260)
Bulgaria	-0.775	*	0.460	(0.308)
Brazil	-0.266		0.766	(0.162)
Canada	-1.138	***	0.320	(0.356)
Switzerland	-0.853	***	0.426	(0.169)
Chile	-0.501	*	0.606	(0.210)
Czech Republic	-0.907	***	0.404	(0.233)
Germany	-0.990	***	0.371	(0.201)
Denmark	-0.445		0.641	(0.330)
Spain	-0.133		0.876	(0.134)
Estonia	-1.049	**	0.350	(0.368)
Finland	-0.385	**	0.680	(0.144)
France	-0.778	***	0.460	(0.195)
United Kingdom	-0.121		0.886	(0.169)
Greece	-0.359	*	0.698	(0.163)
Hong Kong	0.204		1.226	(0.146)
Croatia	-0.732	***	0.481	(0.166)
Hungary	-0.950	***	0.387	(0.246)
Ireland	-0.727	***	0.484	(0.121)
Iceland	0.115		1.122	(0.336)
Israel	-0.509	*	0.601	(0.234)
Italy	-0.994	***	0.370	(0.237)
Jordan	-2.568	***	0.077	(0.758)
Japan	0.442	***	1.556	(0.137)
Korea	-0.006		0.994	(0.125)
Lithuania	-0.560	*	0.571	(0.253)
Luxembourg	-0.382	***	0.682	(0.105)
Latvia	-2.125	**	0.119	(0.829)
Macao	-0.215		0.807	(0.150)
Mexico	-0.740	***	0.477	(0.180)
Montenegro	-0.725	***	0.484	(0.136)
Netherland	-0.434	*	0.648	(0.181)
Norway	-0.560	**	0.571	(0.208)
New Zealand	-0.986	***	0.373	(0.257)
Peru	-0.563	*	0.569	(0.264)
Poland	-0.519		0.595	(0.330)
Portugal	0.455		1.577	(0.281)
Romania	-0.427	*	0.652	(0.208)

Singapore	-0.296		0.744	(0.180)
Slovak Republic	-1.137	***	0.321	(0.234)
Slovenia	-0.503	**	0.605	(0.196)
Sweden	-0.188		0.829	(0.278)
Thailand	-0.124		0.884	(0.151)
Tunisia	0.144		1.155	(0.137)
Turkey	-0.445	**	0.641	(0.147)
Uruguay	-0.752	***	0.471	(0.203)
USA	-0.755	***	0.470	(0.220)

Note. The coefficient (*β)* presents the change in the likelihood that boys have of expecting to work as teachers at the age of 30, controlling for family socioeconomic status, having parents who work as teachers, academic ability in reading, math and science, and the school's socio-economic composition.
***$p \leq .001$, **$p \leq .01$, *$p \leq .05$

Appendix G. Sub-Sample of Students Expecting to Work in Professional Occupations: Results of Hierarchical Bernoulli Logit Models to Explain Variation in Expectations for the Teaching Profession

	Model 1			Model 2			Model 3		
	β	Odds Ratio	Standard Error	β	Odds Ratio	Standard Error	β	Odds Ratio	Standard Error
Intercept	-2.293 ***	0.101	0.102	-2.266 ** *	0.104	0.100	-2.270 ***	0.103	0.092
Individual level:									
Boy	-0.493 ***	0.610	0.064	-0.475 ** *	0.622	0.060	-0.509 ***	0.601	0.063
Family SES	-0.199 ***	0.819	0.033	-0.198 ** *	0.820	0.033	-0.199 ***	0.820	0.032
Mother in the teaching profession	0.540 ***	1.715	0.087	0.536 ** *	1.709	0.084	0.537 ***	1.711	0.084
Father in the teaching profession	0.632 ***	1.882	0.130	0.634 ** *	1.885	0.127	0.635 ***	1.888	0.124
Reading literacy score	-0.031	0.969	0.050	-0.031	0.970	0.049	-0.032	0.969	0.049
Math literacy score	0.017	1.017	0.056	0.017	1.017	0.054	0.017	1.017	0.053
Science literacy score	-0.149 **	0.862	0.051	-0.148 **	0.862	0.050	-0.149 **	0.861	0.050
Individual-level interactions:									
Boy x Mother in teaching	-0.021	0.979	0.127	-0.020	0.980	0.123	-0.018	0.982	0.123
Boy x Father in teaching	0.328 †	1.388	0.188	0.321 †	1.379	0.186	0.324 †	1.382	0.181
School level:									
School mean SES	-0.118	0.888	0.078	-0.122	0.885	0.077	-0.126 †	0.882	0.076
Country level:									
PISA sample selectivity	0.058 ***	1.060	0.016	0.043 **	1.044	0.014	0.061 ***	1.063	0.012
Log of GDP per capita	0.091	1.095	0.373	0.097	1.102	0.375	0.294	1.341	0.245
Share of male teachers in lower-secondary education	0.338 **	1.403	0.097						
Gender egalitarianism: Husband and wife should contribute to income				-0.170 *	0.844	0.079			
Teacher salaries relative to GDP per capita in lower-secondary education							0.479 ***	1.614	0.131

Cross-level interactions:											
Boy x male teachers	0.064		1.066	0.065							
Boy x gender egalitarianism					-0.121	†	0.886	0.064			
Boy x teacher salary									0.160	†	1.173	0.081
N											
Student (unit of observation)	21011 4				21011 4				21011 4		
School	8115				8115				8115		
Country	30				30				30		
Variance components (country level)											
Intercept	0.306	***			0.383	** *			0.316	***	
Slope of boy	0.090	***			0.089	** *			0.088	***	

***$p \leq .001$, **$p \leq .01$, *$p \leq .05$, †$p \leq .10$

β = Coefficient, *OR* = Odds Ratio, *SE* = Standard Error

Population average models with robust standard errors.