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RESEARCH ARTICLE



Public service equity and stakeholder satisfaction: evidence from 56 countries on how parents, teachers, and students respond to gender gaps in education

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ABSTRACT

This study examines how gender equity in educational achievement relates to the satisfaction of three key stakeholders: students, parents, and teachers. Using cross-national panel data from the Trends in International Mathematics and Science Study (TIMSS), covering 56 countries from 2011 to 2019, we link gender gaps in student math and science performance to student and parent satisfaction with schooling, as well as teacher satisfaction with their jobs. We find that gender inequity is associated with lower satisfaction, but parents with a female student and higher SES respond to the gender inequity the most. These findings extend the citizen satisfaction and public service equity literatures by showing that different stakeholders in the same public service system can respond quite differently to inequities, with implications for how governments communicate about and address performance gaps and equity concerns.

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Introduction

Citizen satisfaction with public services sits at the intersection of two major literatures in public administration. The management side of public administration has focused on how government programs can be delivered in effective and efficient ways, while the politics side of it asks how bureaucracy, a hierarchical and nondemocratic institution, can be reconciled with the concept of democratic governance (Nabatchi, Goerdel, and Pfeffer 2011; Selden, Brewer, and Brudney 1999). In addition, public management literature regards citizens as crucial stakeholders in questions of government performance and the performance management movement (Osborne and Gaebler 1993; Van Ryzin 2007), while political scholars see the responsiveness of government programs to the public as a major requirement of a democratic system (Verba 1996). Citizen satisfaction with public services, therefore, addresses both the management concerns with effectiveness and efficiency and the democratic focus on government responsiveness to citizens.

Given the importance, citizen satisfaction has been extensively studied in public management (Jilke and Baekgaard 2020; Marvel 2015; Petrovsky, Xin, and Yu 2023; Zhang et al. 2022). Gaps in the citizen satisfaction literature remain, however, notably regarding how citizen satisfaction can be affected by the level of (in)equity in public service. With only a few modest exceptions, the literature focuses on effectiveness rather than other evaluative dimensions of

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performance, such as equity, fairness, responsiveness, etc. Although some literature asks citizens to evaluate program outcomes across multiple dimensions (see Hvidman and Andersen 2014; Meier, Johnson and An 2019; Walker et al. 2018), even these experimental studies often offer only a single view of performance rather than information on other dimensions. To take a step in this direction, this study investigates whether citizens respond to inequities in public service.

Equity, which broadly refers to fairness in the distribution of resources and the delivery of social services, has long been one of the guiding principles of political and policy systems (Gooden and Portillo 2011; Cepiku and Mastrodascio 2021). As one of the core pillars of public administration (Frederickson 1990), the importance of equity has appeared in the field's major theoretical discussions, including the first Minnowbrook conference in 1968 convened by Dwight Waldo, the New Public Administration (Frederickson 1990), and the public value framework (Beck Jørgensen and Bozeman 2007; Nabatchi 2018), among others. Despite its normative importance, empirical investigations of equity have been nascent.

To fill gaps in both literatures on citizen satisfaction and equity, this study tests relationships between service (in)equity and stakeholders' satisfaction. We examine this relationship in the context of education, a service sector central to public administration for at least two important reasons. First, education is arguably one of the most fundamental public services experienced by most citizens. In almost every country, citizens are engaged in the education system throughout their lives, first as direct service recipients (students) and often later as key stakeholders (parents). Education, therefore, represents a high-contact public service in which citizens develop consistent and experience-based assessments of government performance. This makes it an especially relevant setting for studying citizen satisfaction. Second, the provision of education services is a significant undertaking for governments, requiring substantial administrative and financial effort. According to the OECD (2023), education expenditures in OECD countries range from approximately 6% to 16% of total government expenditures (about 10% on average). Examining the public evaluation of a public service that accounts for such a significant share of government expenditures is thus an important question for public administration scholars.

The importance of education as a topic in public administration is reinforced by its prominent place in the literature. Since the classical work of James March (March 2007; March and Simon 1958), which used universities to provide supporting evidence, educational data and cases have played a significant role in addressing major questions in public administration. Analysis of educational institutions has significantly shaped the debate on public versus private organizations (Bohte 2001; Chubb and Moe 1988) and has been central to empirical studies linking various management strategies to better performance in public organizations (O'Toole & Meier 2011), including the use of performance information by managers (Andersen and Nielsen 2020; Moynihan and Hawes 2012). Education research has also directly addressed equity as one of the central public values that undergird public administration (Roch, Pitts, and Navarro, 2010).

In this paper, we use cross-national education panel data (Trends in International Math and Science Study; TIMSS) involving gender equity in fifty-six countries from 2011 to 2019 and investigate how the presence of (in)equity determines three different stakeholders' satisfaction: students' and parents' satisfaction with services and teachers' satisfaction with their jobs. Reflecting broader misconceptions about women in society, girls, on average, are less likely to pursue STEM fields and thus face limits on both further education and career outcomes. TIMSS provides information from an international test of math and science for individual students, which can be matched to both parents and teachers, who are also surveyed. This permits an examination of how key stakeholders' satisfaction responds to equity in the provision of education. This paper, therefore, brings cross-national evidence on the equity-satisfaction relationship through the lenses of multiple stakeholders, thereby adding to and advancing a few recent studies on this topic (Song, An, and Yang 2025; Song, Kim, and Favero 2020).

Theories on stakeholder satisfaction and service equity

Stakeholder satisfaction with government performance

Measuring and managing government performance has been a cornerstone of public management research. No clearly agreed-upon measure, however, exists regarding performance of public organizations because government organizations have multiple important performance dimensions (Christensen and James 2022) and are accountable to different sets of stakeholders who might consider different factors in their assessments (Walker et al. 2018). In addition, government performance is not always quantifiable, and different policy areas may require different sets of performance measures (Song, An, and Meier 2021).

Among the different types of measures, scholars often use stakeholders' assessments of public service outcomes (e.g., citizen and employee satisfaction) to investigate government performance. These perceptual measures capture the quality of public services as viewed by the organization's internal and external stakeholders and can provide valuable information for improving public service outcomes (Brudney and England 1982; Song, An, and Meier 2021). In the context of education specifically, stakeholder perceptions (e.g., satisfaction among students, parents, and teachers) have been regarded as key indicators of school quality and performance (Meier and Lemmer 2019).

Within the public administration literature on citizen satisfaction, education data and its analysis has been frequently used in part because education systems produce comprehensive data sets that can link parent and student satisfaction with a wide variety of objective and subjective indicators of school performance such as test scores, graduation rates, school safety, and student wellbeing. This research demonstrates that citizen satisfaction is positively correlated with student performance on test scores (Charbonneau and Van Ryzin 2012), indicators of school safety and exit exams (Favero and Meier 2013), and student wellbeing (Hjortskov 2019). Additional research has demonstrated that parents respond to both the overall quality of schools and the performance of their own children (Song and Meier 2018).

An extensive volume of research, therefore, has examined citizen and stakeholder satisfaction with public services (Jilke and Baekgaard 2020; Marvel 2015; Petrovsky, Xin, and Yu 2023; Zhang et al. 2022). The literature has grown from initial simple questions of whether citizens are capable of accurately assessing program performance (Marvel 2015), to a multi-dimensional literature that recognizes public programs having multiple goals (Christensen and James 2022), that citizens consist of multiple stakeholders not a single entity (Song and Meier 2018), and that the evaluation process operates at the individual level and is influenced by personal characteristics (Morgeson and Petrescu 2011), the sector delivering the services (Hvidman and Andersen 2014), psychological biases (Jilke and Baekgaard 2020; Marvel 2015), and the quality and format of the information provided and several other factors (Hjortskov 2017; Walker et al. 2018).

Yet, we know little about the role of equity in shaping satisfaction with public services (Walker et al. 2018). This gap is also salient in the field of education studies, where outcome disparities across different student groups are highly visible (Hyde and Mertz 2009) but rarely tested in stakeholder satisfaction models. Because satisfaction is a primarily perceptual indicator, individuals' perceptions of equity should affect their satisfaction. A recent study by Song, Kim, and Favero (2020) indeed finds that service users' satisfaction is affected by outcome inequity for South Korean public schools. Another gap in the literature is that most satisfaction studies focus on service user/citizen satisfaction even though different stakeholders' perspectives are important (see Song and Meier 2018). In this paper, we incorporate multiple stakeholders' perspectives, namely employees (i.e., teachers) and citizens (i.e., both parents and students) in our cross-national education panel data to test the relationship between equity and satisfaction. The following section discusses the conceptualization of equity and the importance of considering equity in studying public management and stakeholder satisfaction.

Conceptualizing equity

Equity is broadly concerned with achieving fairness, impartiality, or equality (Okun 1975; Savas 1978:802) in distributing resources and delivering social services. While equity is difficult to define, scholars have conceptualized it in various ways, in terms of inputs, resources and access, processes, outputs, and outcomes (Cepiku and Mastrodascio 2021). Some scholars have also identified equity in terms of gender, race, ethnicity, and socioeconomic status, among others (Blessett et al. 2019). Among various approaches in measuring equity for empirical testing, one prominent approach is to focus on outcome disparities between the advantaged and the disadvantaged individuals (Wooldridge and Gooden 2009; Song, An, and Yang 2025). This approach is also common in education literature, given the importance of outcome disparities across various demographic groups as an indicator of school performance and equity (Reardon 2011; OECD 2015).

Given our context of public education, one outcome disparity (i.e., service inequity) can be reflected in the gender-based performance gap in math and science scores. Previous education research has noted persistent gender differences in STEM-related subjects, due to several factors such as social norms and expectations, levels of access to resources, and institutional practices (Hyde and Mertz 2009). When male students perform better than female students in these two subjects, such differences may be a signal of underlying inequities in resource allocation (e.g., having qualified teachers and/or better access to advanced coursework) and procedural fairness (e.g., teacher expectations or bias in delivering instructions). The gender gap in STEM-related subjects, therefore, can serve as a quantifiable indicator of evaluating whether public education delivery resonates with the equity imperative—that individuals who invest similar levels of effort should achieve similar levels of outcomes, regardless of gender.

Equity has been recognized as an important value of public administration and concerns about upholding equity in public management abound (Nabatchi 2010; Lebovits and Teal 2020). As evident in the long-standing tension between bureaucratic and democratic ethos (Nabatchi 2010; Vigoda-Gadot 2006), public organizations are tasked with providing efficient and effective public services, which often makes it challenging to accomplish equity in public service delivery (Lebovits and Teal 2020; Nabatchi 2010) given the classic tradeoff between equity and efficiency (Okun 1975). In addition, the field of public administration itself has often paid more attention to bureaucratic ethos such as efficiency and economy, than to democratic ethos including equity (Pugh 1991; Wagenheim and Reurink 1991). Examples trace back to the politics-administration dichotomy (Wilson 1887) and continue from the principle of POSDCORB (Gulick 1937), the model of bounded rationality and satisficing decision-making (Simon 1947), to the New Public Management and administrative reform movements in the 1990s. While the field has favored these managerialist approaches, equity has generally been understudied and received less attention in managing public organizations (Nabatchi, Goerdel, and Peffer 2011).

Studies on citizen and stakeholder satisfaction are no exception to this practice. Previous research has mainly focused on the effects of service quality and performance information on satisfaction (Swindell and Kelly 2000; Van Ryzin 2004) and has rarely examined whether and how equity influences stakeholder satisfaction. Similarly, education studies have also rarely linked outcome disparities directly to stakeholder satisfaction across multiple groups (students, parents, and teachers). This study, therefore, contributes to the knowledge base in both public administration and education. The following section presents detailed theoretical mechanisms on the relationship that lead to our research hypotheses.

Theoretical linkages between equity and stakeholder satisfaction

The relationship between equity and individuals' satisfaction has been theorized in the organizational studies literature, including organizational justice theory and equity theory. Organizational justice theory posits that inequity in an organization negatively affects the satisfaction of internal

and external stakeholders (Greenberg 1987). This theory assumes that people want fairness and justice in organizations' managerial processes, including the production and delivery of public services. Individuals' perception of whether the organization is fair and just affects individual and organizational-level outcomes such as satisfaction, worker productivity, organizational citizenship behaviors, and organizational performance (Greenberg 1987, 1990). According to the theory, individual stakeholders' well-being, which includes their satisfaction with organizational outcomes and services, can be affected by the degree of justice and fairness in the following: "(1) *values* underlying the rules governing the distribution (of resources and benefits), (2) *rules* which are employed to represent the values, (3) the ways that the rules are *implemented*, and (4) *decision-making procedures* that are used in the implementation" (Deutsch, 1975:138).

In schools for example, there might be a certain set of values at play implicitly to treat female and male students differently, which then subsequently affect the rules, implementation, and decision-making procedures at the schools. These implicit mechanisms might create an (in) equitable distribution of resources that can determine female and male students' performance, thereby affecting students' and parents' satisfaction. Job satisfaction of teachers—as employees of public organizations—can also be affected by the presence of equity in schools. When employees perceive inequities in public service delivery, such as unequal access to educational programs for male and female students, they may interpret this as a signal of unfair institutional practices, which may undermine their sense of moral alignment with the organization's public service mission. This can result in reduced levels of intrinsic motivation and job satisfaction for teachers. An extensive literature on teaching stresses the norm of educating all children (Masland 1994; Sadker, et al. 2014) which is then reinforced by performance systems that show outcome results by gender, race and other factors (Shmurak and Ratliff 1994) and can in the process affect the relationship between teacher job satisfaction and performance (Banerjee et al. 2017; Meier, Prince, and An 2025).

In short, organizational justice theory posits that (in)equity in public services—which may be present in organizational values, rules, implementation, and decision-making procedures—can affect stakeholder satisfaction. Empirical evidence also provides strong support for the equity-satisfaction link; a meta-analysis of 25 years of organizational justice studies shows that equity in the distribution of resources and benefits is strongly correlated with stakeholders' outcome satisfaction (Colquitt et al. 2001). Based on both theory and previous empirical evidence, we offer our first hypothesis as follows.

Hypothesis 1: *Inequity in public service outcomes is negatively associated with stakeholder satisfaction.*

Our specific test of hypothesis 1 will examine whether the gap between girls' and boys' math and science scores affects students' and parents' satisfaction with the schools, as well as teachers' satisfaction with their jobs.

While inequity can generally affect all individuals' satisfaction levels, as hypothesized above, the relationship can also differ by an individual's group membership. When an individual is in a disadvantaged group that receives fewer benefits (e.g., people of color, females, and individuals with lower socioeconomic status), she or he might react more negatively to the level of inequity. Equity theory supports this argument. Developed by J. Stacy Adams, a behavioral psychologist, equity theory asserts that individuals assess equity by comparing the ratio of their inputs and benefits to the perceived ratio of others' inputs and benefits (Adams 1963). If individuals think that they have received fewer benefits than others who provide the same or fewer inputs (meaning that their input/output ratio is lower than others' input/output ratio), they are more likely to be concerned about (in)equity and tend to be less satisfied. The basic assumption is similar to that of organizational justice theory: people value fairness in any relationship involving social exchange. Applying this theoretical logic, those in a less advantaged group who receive fewer benefits are more likely to be dissatisfied when they perceive inequity in public service processes, assuming they have provided the same (or higher) level of inputs as those who are viewed as

receiving more benefits. For instance, when there is a performance gap between female and male students that favors male students, female students are more likely to be dissatisfied than male students, believing that their input levels are equivalent to those of male students yet receiving fewer benefits than their male peers. Based on these theoretical mechanisms, we present our second hypothesis as follows.

Hypothesis 2: *Stakeholders who are directly affected by inequity—i.e., members of the disadvantaged group—will show greater satisfaction declines in response to inequity than other stakeholders.*

Our specific test of hypothesis 2 will examine whether female students and their parents are more likely to respond to gender inequity in test scores. We are assuming that experiencing a disadvantage is likely to matter more than simply sharing an identity.

It is important to note that individuals' satisfaction is largely determined by their expectations prior to receiving services, as posited by the expectancy-disconfirmation model (EDM) (James 2007; Morgeson 2013; Van Ryzin 2004). Previous research has highlighted the importance of considering different contextual factors in testing the EDM (Song, Kim, and Favero 2020), as these contextual characteristics can affect individuals' level of prior expectations, although the lack of dynamic databases limits most studies to correlational analysis (see Favero, Walker, and Zhang 2025). Based on these previous studies, we posit that the equity-satisfaction link is moderated by factors which affect individuals' expectations as to what is considered as an equitable service delivery. In this paper, we argue that individuals with higher socioeconomic status will have both the motivation and the resources to be more concerned about gender equity in education.

Expectations for public policy, including in terms of equity, should be influenced by the individual's policy experience and by what is perceived as possible. A person living in a rural area with few services is less likely to expect the same level of service as a person living in a modern city with extensive services. One crucial factor in determining a person's expectations for public services, and thus, the service-satisfaction relationship, is socioeconomic status (relevant to education see Pinquart and Ebeling 2020; Stull 2013; Song, Kim, and Favero 2020). In the context of education, for example, parents with higher SES often make significant financial and social investments in their children's schooling, which may heighten their expectations regarding both performance and equitable treatment (Schneider, Teske, and Marschall 2002). This suggests that higher-status parents will have higher expectations and be less satisfied with programs if they are disadvantaged relative to others.

These mechanisms are highly relevant to gender equity in education. While gender gaps in STEM outcomes have narrowed in some contexts, gender gaps in achievement have persisted (Hyde and Mertz 2009; OECD 2015). Given that higher-SES parents are likely to make significant investments for their girls' education and hold egalitarian gender norms, they may anticipate equal opportunities for their daughters, even in traditionally male-dominated fields. Accordingly, they are likely to be more dissatisfied when they find that their female child is receiving fewer benefits from her schools than her male peers. In other words, when there is a negative gap between individuals' level of equity expectations prior to the service and the perceived level of equity in the service they have received (i.e., negative disconfirmation), they become less satisfied (Van Ryzin 2004). This logic is consistent with the concept of higher-status parents as the marginal consumers in education policy and the focus of many education reforms (Schneider, Teske, Marschall 2002). Based on these mechanisms, our third hypothesis is as follows.

Hypothesis 3: *The relationship between equity and satisfaction differs by individuals' socioeconomic status. Specifically, the negative effect of inequity on satisfaction will be stronger for individuals with higher socioeconomic status than for those with lower socioeconomic status.*

Our specific test of hypothesis 3 will examine whether parents of female students who have higher levels of socioeconomic status are more likely to respond to gender inequity in test scores.

Research design and measurement

Data and method

When evaluating public services, relevant stakeholders (e.g., citizens, bureaucrats, or experts) should at least have access to, have experienced, or have substantial knowledge of the programs. Since most citizens have access to, or have experienced, educational services, and education is a highly salient policy issue across countries, it provides an excellent context for testing our hypotheses on equity-satisfaction relationships. Education also has the advantage of a high-quality individual-level data set (enabling matching of teachers with parents and students) with validated indicators of stakeholder perceptions and outcomes that are comparable across countries. For these reasons, we employ the Trends in International Mathematics and Science Study (TIMSS) cross-national education panel data involving fifty-six countries over eight years.¹ TIMSS examines fourth- and eighth-grade student performance on mathematics and science and asks students, parents, teachers, and school administrators a series of questions to evaluate student learning contexts. Given that parent satisfaction questionnaires are only asked for fourth-grade parents, we use fourth-grade students and their parents as the main units of analysis.²

To provide a clearer picture of our key independent variable and the cross-national context of our study, we created a plot that provides descriptive evidence on the distribution of gender performance gaps across the 56 countries included in our analysis (see [Figure A1](#) in the appendix). The figure plots the country-level gender gap in TIMSS scores (calculated as the difference between boys' and girls' average scores) against average parent satisfaction. This highlights substantial cross-national variation in gender-based outcome disparities. The figure also reveals a clear macro-level pattern: countries with larger male performance advantages (higher inequity) tend to exhibit lower levels of parental satisfaction. While this descriptive relationship is not causal, it provides initial support for our theoretical argument on the negative relationship between inequity and satisfaction.³

The advantages of the TIMSS data are the ability to link individual student performance to the student, the student's parents, and the teachers involved. The cross-national nature of the data set enhances the generalizability of the findings given that gender inequalities and gender roles vary across countries and is consistent with recent calls for additional comparative public administration research (McDonald et al. 2022). The sampling frame that generates the advantage of a national representative sample, however, limits the number of cases per school and thus restricts the use of some school level variables.

TIMSS is sponsored and administered by the International Association for the Evaluation of Educational Achievement (IEA) and Boston College. The fourth-grade target student populations are about 9.5 years old: four years after they began the United Nations Educational Scientific and Cultural Organizations (UNESCO)'s International Standard Classification of Education (ISCED) Level 1 (UNESCO 2012).⁴ If fourth-grade students in a country are younger than the average or the fifth or sixth-grade students are more equipped with skills to solve mathematics or science exams for fourth-grade students, such countries can decide whether they will participate in TIMSS with the fifth- or sixth-grade students. Each country provides its national target population to TIMSS.

TIMSS aims to recruit approximately one hundred fifty schools and four thousand students per country. To ensure a representative sample of students, TIMSS employs a two-stage stratified random sampling design. During the first stage, the list of schools is generated using a uniform distribution, and schools are randomly selected using stratifications on demographic and geographic characteristics (LaRoche, Joncas, and Foy 2019). After that, one or more classes are randomly chosen from the selected school. Within the selected classes, students can be excluded from the exam if they are physically or mentally unable to participate or are non-native speakers with less than a year of instruction in the language of the test (for more details on the sampling design, see LaRoche, Joncas, and Foy 2019).

Our data has a multilevel structure involving various stakeholders at different levels across countries over time to show how gender performance inequity affects user/citizen (student and parent) and provider/employee (teacher) satisfaction and how the relationship changes based on the expectations that stakeholders may have based on the individuals' socioeconomic characteristics (parent occupation). Estimating such relationships with traditional regression models by ignoring the multilevel data structure can be inefficient; estimated standard errors in such models are likely to be biased downward.

Since the dataset involves three levels such as individual (student or parent or teacher), organization (school), and country, employing multilevel analyses would be ideal. Yet, TIMSS does not provide unique individual and school IDs to ensure anonymity. Therefore, for modeling purposes, we can only deal with two levels. Our approach is to cluster standard errors by country, which outperforms traditional ordinary least square regression models with multilevel data (Arceneaux and Nickerson 2009).

Variables

Dependent variables

The dependent variables are student and parent (user) satisfaction with the school and teacher (provider) satisfaction with their job. From 2011 to 2019, TIMSS asks parents and students a series of survey questions to evaluate the quality of school using seven and three survey questions, respectively. Parents evaluate their child's school based on the quality of education and school environments (e.g., safety, parent involvement, communication between parents and schools, etc.). Students also answer survey questions that can help evaluate the quality of schools although the student questions are more focused on student wellbeing than perceptions of performance. Such questions address whether students like being in school, feel safe when they are at school, and feel like they belong to their school, items that indirectly might reflect differences in treatment by gender within a school. Lastly, we use five survey questions to measure teacher satisfaction with their job and the teaching profession. The survey questions ask teachers whether they are satisfied with their job and whether teaching has intrinsic values to them.⁵ Although these questions do not assess teacher perceptions of school performance, there is evidence that job satisfaction and perceptions of organizational performance are correlated at the individual level (Petrovsky et al. 2023; Meier, Prince and An 2025). All survey questions are on a five-item Likert scale from strongly disagree to strongly agree.

Using the survey questions, we first run an exploratory factor analysis with the principal-component factor for each stakeholder's satisfaction measure. All student, parent, and teacher survey items loaded onto a single factor with eigenvalues of 1.83, 3.7, and 3.59 and Cronbach's alphas of 0.68, 0.87, and 0.9, respectively.⁶ The factor analytic results including factor loadings can be found in Table A1 in the Appendix. After that, we create composite scores for each stakeholder satisfaction measure by adding the survey items belonging to each stakeholder together. Then, we rescale each stakeholder satisfaction measure to range from 0 to 100.

Key independent variables

As discussed in the theory section, the concept of equity is difficult to define. Scholars have taken various approaches to conceptualize equity for empirical testing, and one way to do so is to focus on the outcome disparities between the advantaged and the disadvantaged groups (Song, Kim, and Favero 2020; Song, An, and Yang 2025; Wooldridge and Gooden 2009). We, therefore, use the performance gap between male and female students in this study. This measure serves as a proxy for the presence of inequity in public service encounters (i.e., education), as discussed in the theory section. This study also includes key independent variables such as gender of the student, and the Socio-Economic Status (SES) of students and parents. To create the gender achievement gap in schools, we calculate the average student performance in mathematics and

science by gender. After that, we subtract the average female student performance scores from the average male performance scores. The achievement gap between female and male students can theoretically be between $-1,000$ and $1,000$ since TIMSS test scores can range from 0 to 1,000. Gender gaps in math and science are generally small at the fourth-grade level and widen as students age and various factors exacerbate these differences (Keiser et al. 2002). The fourth-grade gap, thus, is best viewed as an early indicator of eventual gender gaps in education, and research shows that early intervention in such concerns can be effective (Gersten, Jordan, and Flojo 2005). Gender of the student is coded as a binary variable (female = 1; male = 0).

As sources of individuals' expectations at the individual level, we use the SES of students and parents taken from the TIMSS parent survey. As proxy for SES, we use the highest parent occupation variable. Highest parent occupation measure ranges from 0 to 5 (0 = never worked for pay; 1 = general laborer; 2 = skilled worker; 3 = clerical; 4 = small business owner; and 5 = professional).⁷

Controls

Archival service quality, socio-economic and demographic factors, and organizational characteristics play a key role in determining various stakeholder satisfaction (Brown and Benedict 2002; Song and Meier 2018; Song, An, and Meier 2021). To account for those, we include various student and parent, teacher, and school control variables. For students and parents, we control for gender of student (female = 1; male = 0), the student's performance on the tests, the average student performance for the school, parent's occupation, immigrant status (immigrant = 1; native = 0), and home support (0 = neither own room nor internet connection; 1 = either own room or internet connection; 2 = both own room and internet connection). Gender of the teacher, years of teaching experience, and perceived parent involvement⁸ in school by teachers⁹ are also included to capture teacher characteristics.

For school controls, we include student SES composition at school (0 = more affluent students; 1 = neither more affluent nor more disadvantaged; 2 = more disadvantaged) and school location (0 = Urban-Densely populated; 1 = Suburban-On Fringe or outskirts of an urban area; 2 = medium size city of large town; 3 = small town or village; 4 = remote rural) variables. The descriptive statistics for all variables can be found in Table A2 in Appendix.

Findings

The analysis of whether stakeholders consider gender equity in their assessments of satisfaction with public programs proceeds in three steps. First, for testing hypothesis 1, we add a measure of gender equity to an existing model of stakeholder satisfaction that considers both the overall performance of the school as well as the performance of the specific individual (either the student or the parent's child; see Song and Meier 2018). Second, to determine if stakeholders' assessments about equity reflect a general concern about equity or a more focused concern about inequity only when it directly affects them (hypothesis 2), we examine the impact of whether the child in question is female. Third, we examine whether higher socio-economic status individuals with female children, who are likely to have higher expectations for the education system and are more sensitive to gender inequities that might affect their child, are less satisfied with gender inequities in performance (hypothesis 3). Tables 1 and 2 examine the first two hypotheses, and Table 3 investigates the third hypothesis.

Table 1 employs client satisfaction. The first two models use parent satisfaction and the third and fourth use student satisfaction. Models 1 and 3 examine the relationship between service inequity and client satisfaction, testing our first hypothesis (hypothesis 1). Models 2 and 4 add an interaction term (student gender) to the models (hypothesis 2). Model 1 in Table 1 analyzes the determinants of parent satisfaction with schools and indicates that parents are more satisfied when their own child performs better, but less satisfied when the school in question has higher

Table 1. The effects of the achievement gap by gender and moderating role of student gender on parent and student satisfaction.

DV: Client satisfaction	Parent		Student	
	Model 1	Model 2	Model 3	Model 4
Performance inequity	−0.003 (0.005)	−0.000 (0.005)	−0.007* (0.004)	−0.007 (0.005)
Performance inequity × Female student		−0.006*** (0.002)		0.001 (0.004)
Female student	0.368*** (0.066)	0.382*** (0.063)	3.940*** (0.214)	3.938*** (0.213)
Parent involvement	1.065*** (0.229)	1.065*** (0.229)	0.641** (0.251)	0.640** (0.251)
Student performance	0.010*** (0.001)	0.010*** (0.001)	0.018*** (0.001)	0.018*** (0.001)
School performance	−0.028*** (0.007)	−0.028*** (0.007)	−0.038*** (0.007)	−0.038*** (0.007)
Immigrant status	1.599*** (0.367)	1.598*** (0.367)	−0.051 (0.451)	−0.051 (0.451)
Female teacher	1.098 (0.688)	1.098 (0.687)	0.239 (0.524)	0.239 (0.524)
Teacher experience	0.005 (0.015)	0.005 (0.015)	0.021 (0.015)	0.021 (0.015)
Highest parent occupation	−0.724*** (0.114)	−0.724*** (0.114)	−0.406*** (0.126)	−0.406*** (0.126)
Home study support	−0.284 (0.243)	−0.283 (0.243)	−0.010 (0.300)	−0.010 (0.300)
Student SES composition at school	0.113 (0.220)	0.113 (0.220)	0.101 (0.270)	0.101 (0.270)
School location	0.013 (0.134)	0.014 (0.134)	0.239 (0.158)	0.239 (0.158)
Constant	97.698*** (2.826)	97.689*** (2.826)	94.348*** (3.025)	94.350*** (3.025)
R-Squared overall	0.0336	0.0336	0.0341	0.0341
N	499947	499947	504450	504450

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$; standard errors clustered by countries; year fixed effects included but not reported.

Table 2. The effects of the gender achievement gap on teacher satisfaction.

DV: Teacher satisfaction	Model 1
Performance inequity	−0.010** (0.004)
% Female teachers	0.014 (0.010)
% Female students	0.010 (0.010)
Parent involvement	4.062*** (0.216)
School performance	−0.030*** (0.004)
Female teacher	3.061*** (0.421)
Teacher experience	−0.009 (0.018)
Student SES composition at school	0.340 (0.212)
School location	0.340*** (0.126)
Constant	95.597*** (2.412)
R-Squared overall	0.0946
N	25139

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$; standard errors clustered by countries; year fixed effects included but not reported.

Table 3. The effect of gender achievement gap on satisfaction in different SES groups.

	Lower SES	Higher SES
	Model 1	Model 2
Performance inequity	0.001 (0.005)	−0.001 (0.005)
Female student	0.295*** (0.093)	0.459*** (0.071)
Performance inequity × Female student	−0.003 (0.002)	−0.009*** (0.003)
Parent involvement	0.942*** (0.215)	1.149*** (0.270)
Student performance	0.010*** (0.001)	0.010*** (0.002)
School performance	−0.025*** (0.007)	−0.029*** (0.007)
Immigrant status	1.390*** (0.385)	1.647*** (0.447)
Female teacher	1.448* (0.823)	0.797 (0.590)
Teacher experience	0.017 (0.017)	−0.001 (0.015)
Highest parent occupation	−1.351*** (0.175)	−1.075*** (0.236)
Home study support	−0.176 (0.263)	−0.341 (0.252)
Student SES composition at school	0.249 (0.247)	0.013 (0.234)
School location	−0.049 (0.108)	0.057 (0.162)
Constant	97.333*** (3.023)	100.387*** (3.030)
R-Squared overall	0.0403	0.0252
N	218840	281107

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$; standard errors clustered by countries; year fixed effects included but not reported.

test scores. This response suggests that a relative comparison to one's neighbors plays a role in satisfaction, with parents being more pleased if their child performs better in an absolute sense and, by comparison, better than the child's peers. This self-interest view of education contrasts with the more communitarian assessments that Song and Meier (2018) found for Korean schools (see also Song, An, and Meier 2021).

Within this context of overall performance, however, parents generally do not appear to be concerned about equity; the relationship regarding service equity is not statistically significant despite the large sample size. Parent satisfaction is also positively correlated with parental involvement, immigrant status, lower occupational status, and less home study support. In all cases, the relationships are substantively modest, likely reflecting the relatively low visibility of TIMSS, as well as other feedback parents receive about their child's education and the quality of schools.

In terms of students' perspectives (see Model 3 in Table 1), students evaluate schools similarly to their parents, particularly in terms of the theoretical questions addressed by this study. Students are more satisfied with schools if they personally perform well, but it appears that this is done in contrast with their classmates since overall school performance is a negative factor. Regarding gender equity, the relationship is negative and statistically significant in contrast to parents. Students, overall, regardless of their gender, will be less satisfied with schools if inequity exists. Table 2 shows that teachers are also sensitive to public service equity (gender achievement gaps) in education, like students. There is a statistically significant negative relationship between the gender gap in test scores at the school and teacher satisfaction. Female teachers are more satisfied than their male counterparts, and overall teachers rate their satisfaction more positively if there is greater parental involvement and schools are in a more rural setting. Again, the average performance of the school is negatively associated with teacher satisfaction. All in all,

we find partial support for our first hypothesis on the negative association between service inequity and stakeholder satisfaction; the relationship is significant for teachers and students.

Concerns with equity can take two forms. An individual might be generically opposed to inequity and react negatively to it whether or not the individual is disadvantaged; in contrast, the concern with equity might be egocentric, a concern only if the individual is a member of the group that receives fewer benefits. For parents (and students), we will interact whether the student is female with the school gender inequity measure in Model 2 (and Model 4). A negative relationship for this interaction will indicate that parents with a female child or a female student as the respondent feel less satisfied as gender inequity increases.

Model 2 in Table 1 investigates whether parents have concerns about gender equity depending on the sex of their child. With the components of the interaction, the coefficient for public service inequity is now the estimate of the impact for parents with male students; that coefficient is negative (and negligible), and insignificant indicating the parents of boys do not appear to base their satisfaction on gender inequities. Parents of female children, however, are significantly less satisfied with the schools if there is gender inequity (recall this is a measure that reflects boys outperforming girls) in the school's test scores. Although the impact is relatively small, it does support the self-interest interpretation of inequity, that is, inequity is of concern only to those adversely affected by it. We should also note that this estimate is likely to be an underestimate since parents might have other children of a different gender and that might suppress a negative reaction and since schools in many countries either do not have state-sanctioned standardized tests or lack transparency in providing the results.

Student gender differences in reaction to gender inequity in the school are investigated in Model 4 in Table 1. The clear conclusion from the set of null relationships is that neither male nor female students adjust their perceived satisfaction with schools based on the degree of gender inequity in math test scores. Taken together, we find partial support to our second hypothesis given that the effect is significant only in the parent satisfaction model.

Given that only parents and then only those with female children become less satisfied with schools when there are gender inequities in performance, the remaining analysis will focus only on parents. To investigate whether SES might be the source of different expectations regarding educational performance (testing hypothesis 3), Table 3 divides respondents into lower- and higher-SES groups based on the parent occupation.¹⁰ If high-status parents have greater expectations in regard to what they expect from an education system, we will predict that gender inequities would be a greater negative concern for higher-status parents with a female child. The key interactive coefficients in Table 3 are for inequity and female students. They show that there is no significant relationship between service inequity and having a female child if the parents are from a lower SES background, but a significant and negative relationship for those from high SES backgrounds. These relationships are consistent with the idea that individuals with greater resources may have higher aspirations relative to public service equity if they are parents of a female child. This supports our last hypothesis on the moderating effect of individuals' SES on the equity-satisfaction relationship.

Robustness checks

As robustness checks, we include country-level control variables to account for various economic, political, and governance indicators, such as OECD status, labor force participation rates, GDP per capita, trade (% of GDP), population (logged), the governance index, and the democracy index, government expenditure on education, infant mortality rate, sex ratio at birth, woman business and the law index adopted from the World Development Indicator employing two-level multilevel (random constant and random intercept) models. Random constant models replicate our OLS models with clustered standard errors, and random intercept models account for cross-level interaction terms in our models (see Heisig and Schaeffer 2019). Our robustness

check results are presented in [Table A3](#) and remain consistent across models.¹¹ The key results also remain the same when employing fixed effect approaches imposing country-fixed effects on the regression models (see [Table A4](#)).

Discussion

Collectively, our findings suggest that public service stakeholders' satisfaction is affected by public service (in)equity. First, we find that students and teachers are more likely to be dissatisfied when there is inequity in their schools, providing partial support for our first hypothesis of a general negative association between service inequity and satisfaction. Students and teachers, as actors in direct public service encounters (in schools), are concerned about inequity in public service outcomes. When they perceive gender inequity in their organizations, their satisfaction decreases, all other things being equal. This resonates with our expectation based on organizational justice theory; individuals' perceptions of fairness of values, rules, implementation, and decision-making procedures in the organization affect stakeholder satisfaction (Greenberg 1987; Clay-Warner, Reynolds, and Roman 2005). It also provides additional evidence of the equity-satisfaction relationship in public administration, in addition to the findings from organizational psychology literature (Colquitt et al. 2001). Yet, parents are not concerned about the level of general inequity in their children's schools. This seems plausible given that parents are not in direct service encounters (they are not in classrooms, where direct service provision occurs). Parents, therefore, may not care much about a general level of equity in service procedures and decision-making processes, compared to the other two stakeholders at direct service encounters (i.e., students and teachers). They might be interested more in equity in service outcomes rather than whether (in)equity generally exists in the values, rules, and procedures in organizational decision-making and service delivery.

The second set of findings supports this argument; parents are concerned when their female child is directly affected by inequity, as indicated by the significant interaction effect between the gender of child and the gender performance gap. As hypothesized based on equity theory (Adams 1963), parents as service recipients who are outside the direct service encounters may compare the ratio of their daughter's performance (i.e., benefits) to the performance (benefits) by male students. The performance gap can be perceived as inequity that directly affects their female child, assuming that their and their daughter's inputs are similar (or greater) than those of male students and parents. In turn, this can make parents of female children particularly dissatisfied.

The finding that parents of female students are more likely to consider gender inequities in their satisfaction with schools also fits with the recent emphasis in the literature on the psychological and individual factors influencing evaluations (see Zhang et al. 2022). Pursuing that logic further suggests that parents of female children are likely to have different expectations for their child based on what might be possible for a girl child to achieve. Of particular importance should be an individual's own position in society. Within a country and for parents with female children, some parents will have more resources, either political, economic, or social, that might increase expectations related to program performance. In the present case with education, one possible source of greater expectations might be socio-economic status, with higher-status individuals having higher expectations for programs, particularly in the case where their child might be relatively disadvantaged owing to gender.

This relates to our last set of findings that female children's parents with higher levels of SES are more likely to be dissatisfied when there is service inequity in their daughters' schools. This is consistent with EDM theory (James 2007; Morgeson 2013); individuals with higher SES can invest more resources in their female child's education, and thus, may have higher expectations for their daughter to be treated equally in her schools. Therefore, they are likely to be dissatisfied when they perceive service inequity. This suggests the importance of considering micro-level social conditions that shape citizens' perceptions of public services.

All in all, we find support for various theories such as organizational justice (Greenberg 1987), equity theory (Adams 1963), and the expectancy-disconfirmation model (Van Ryzin 2004), which yield important theoretical contributions to the equity-satisfaction relationship. First, our study applies organizational justice theory to explain how equity influences perceptions among both internal stakeholders (e.g., teachers) and external stakeholders (e.g., students and parents), thereby extending the theory beyond the boundary within the organization. By doing so, it links micro-level psychological mechanisms of equity and fairness with macro-level outcomes such as stakeholder satisfaction. Second, by incorporating equity theory, the study demonstrates how public service stakeholders shape perceptions of service equity through comparative assessments of inputs and outcomes, which can then affect their satisfaction. Third, using the expectancy-disconfirmation model, the study shows how individual resources and expectations—particularly SES—moderates the equity-satisfaction relationship, highlighting the role of social stratification in shaping equity perceptions. Together, these theoretical lenses advance the social equity discourse in public administration by illustrating that equity is not only a normative value but also a perceptual and behavioral driver of stakeholder satisfaction.

In addition, our findings provide several implications to the practice of public administration. First, public organizations should seek to establish and maintain rules, values, and decision-making procedures that treat all individuals equally and equitably. As indicated by our first set of findings, both users and providers in public service delivery are more likely to be dissatisfied with the organization when service inequity exists. From a managerial perspective, users' satisfaction with services and employees' job satisfaction are both critical, given their effects on overall organizational performance (Colquitt et al. 2001; Zhang et al. 2022); therefore, organizations should make considerable efforts to remove any barriers of service equity in their organizations (e.g., incorporating equity considerations into performance management systems and training employees to recognize and address biases in daily interactions). Second, in doing so, it is important to pay particular attention to users in the disadvantaged group. Our findings suggest that parents of female children (who are regarded disadvantaged relative to males, especially given the cross-national nature of our sample) are more sensitive to the presence of inequity in service outcomes, compared to those who have male children. To improve all users' satisfaction and thereby advance social equity, everyone—in both advantaged and disadvantaged groups—should be able to reach an equal outcome with an equal level of efforts. This means that public organizations may often need to take extra care of and provide (more) resources to those in the disadvantaged position (Cepiku and Mastrodascio 2021; Frederickson 1990). Lastly, public managers need to consider multiple stakeholders' perspectives in designing and implementing public services (Song and Meier 2018). Our findings on equity-satisfaction relationships significantly differ across the three groups of public service stakeholders. Public organizations have a diverse set of stakeholders whose interests may differ (Walker et al. 2018), which need to be considered in various performance management strategies; managing service equity is not an exception. Equity and satisfaction are indeed perceptual indicators that differ across stakeholder groups (Song and Meier 2018; Walker et al. 2018); thus, inclusive decision-making processes and feedback mechanisms from different stakeholders can help balance competing perspectives and enhance overall legitimacy. By operationalizing equity not just as a policy goal but as a managerial practice embedded in daily service delivery, public organizations can improve both stakeholder satisfaction.

Conclusion

In this study, we find significant effects of equity on various stakeholders' satisfaction with public service, offering several theoretical and practical implications for the field. Our findings, however, are not without limitations. We acknowledge that the relationships between the equity measure and stakeholder satisfaction are relatively modest in this study because of the realities of comparative research using individual-level data. Although TIMSS scores have consistently been

validated as international comparison measures, it is important to note that they are not official performance indicators in any country. Some countries in our sample, in fact, do not even have national performance indicators for education that are reported to various stakeholders. As a result, there is a large information barrier to the performance-satisfaction relationship with these data. There will also be many other indicators (child wellbeing, grades, community discussions, etc.) that can affect satisfaction with the schools. We call for future research on qualitative evidence on equity-satisfaction relationship, which can further investigate detailed mechanisms on how the presence or absence of equity can determine various stakeholders' satisfaction. In addition, there are institutional, political, and cultural differences across countries, which may affect the equity-satisfaction relationships; while we tried to address them using country-level fixed effects in our models, we encourage future studies that better incorporate such factors in empirical testing. Finally, these scores are normed internationally, not nationally, or as in the US at the state level, which means that they incorporate intranational comparisons indirectly *via* an international scale. At a more abstract level, however, performance on these exams is widely used as an indicator of the quality of education; and this aspect of quality is likely to be correlated with other indicators, either objective or subjective, that stakeholders might be able to access.

Despite the limitations, this study makes significant contributions to the citizen satisfaction literature. First, it is one of a few attempts to test the equity-satisfaction relationship. Although equity has long been considered as a key administrative value for democratic governance (Frederickson 1990; Nabatchi 2018; Svava and Brunet 2020), it has received little attention in studying citizen satisfaction. Given that the concept of citizen satisfaction lies at the intersection of bureaucracy (satisfaction being a key performance metric judged by key stakeholders) and democracy (satisfaction being a tool for ensuring democratic responsiveness to citizens), the field's limited attention to the role of equity in forming citizen satisfaction is unfortunate. This study addresses such gap in previous research, thereby making a theoretical contribution to the citizen satisfaction and public management literature. Second, in doing so, we investigate multiple stakeholders' satisfaction, including two groups of service users (students and parents) and a set of service providers (teachers). Despite the presence of multiple stakeholder groups with different interests and perspectives, previous research has generally focused on a single set of stakeholders when studying citizen satisfaction. This study tests the equity-satisfaction relationship using three stakeholder groups' perspectives and finds that the effect of equity on satisfaction indeed differs by different stakeholders. This highlights the importance of incorporating multiple stakeholders' perspectives in studying government performance (Song and Meier 2018). Lastly, we use a cross-national panel dataset of fifty-six countries, which makes an important empirical contribution to the comparative public administration literature. This makes our findings on the equity-satisfaction relationship highly generalizable to different national contexts.

Notes

1. TIMSS has been examining fourth and eighth grade student performance on mathematics and science and their learning context every four years since 1995. Since then, a total of eighty-seven countries participated in TIMSS. However, given that TIMSS did not ask satisfaction questions until 2011, we only use data from 2011 to 2019. For teacher analyses, we examine the relationship using data in 2015 and 2019 because of changes in teacher satisfaction survey questionnaires in 2015.
2. For teacher satisfaction, teachers become the unit of analysis; it is a higher level than the student/parent unit.
3. The nine countries with severe gender gaps, such as Saudi Arabia, the Philippines, Pakistan, Omar, Bahrain, South Africa, Botswana, and Qatar (see [figure A1](#) in the appendix), are less likely to care about the educational gap between boys and girls, which can dampen the proposed relationship.
4. The first year of ISCED level 1 corresponds to the formal education system where students begin to learn reading, writing, and mathematics more systematically.
5. Although job satisfaction and satisfaction with the profession might be considered two separate variables, the indicators are highly correlated and load on a single dimension in the factor analysis.
6. Reliability scores (Cronbach's alpha) above .7 are normally considered as acceptable. Though reliability scores of student items are a bit low (0.68), it is not far away from the criteria. In fact, Nunnally and Bernstein

(1994) warns researchers not to use the suggested criteria as a cutoff point. Realistically, we would also expect scales on children's attitudes might be less reliable than those for adults.

7. We also replicate the analysis with the occupation measure with the highest parent education variable and arrive at the same conclusion. Results in all models also remain largely the same when we control for the parent education variable (results available upon request).
8. Teacher perceived parent involvement measures are created via exploratory factor analysis using two survey questions. The questions ask teachers about parental support for student achievement and parental involvement in school activities within their schools on a five-point Likert scale from very low to very high. Two survey items are loaded onto a factor with eigenvalues of 1.68 and Cronbach's alpha of 0.8.
9. In education, parents often play a role in co-producing school outcomes. Therefore, parent involvement is a key factor that can predict stakeholder satisfactions. In TIMSS, parent involvement survey items are answered by parents, teachers, and school administrators. Among the three stakeholders, we use teacher perceived parent involvement since: 1) parent perceived school involvement is likely to be inflated (self-desirability), 2) it will introduce common source biases for the most important stakeholder satisfaction model—parents—, and 3) teachers work closer than school administrators. Our results remain the same with/without this control variable (results available upon request).
10. Parent occupation variable ranges from 0 (never worked for pay) to 5 (professional) with the mean value of 3.6. Therefore, parents who responded their job as never worked for pay (0), general laborer (1), skilled worker (2), and clerical (3) are categorized as the lower SES group while parents who answered the occupation question as small business owner (4) or professional (5) are categorized as the higher SES group.
11. By adding more country level variables, seven TIMSS entities such as Bosnia and Herzegovina, Botswana, Chinese Taipei, Hong Kong, Kosovo, Republic of Macedonia, and Montenegro, are omitted. To improve the generality of our empirical tests, we chose our main models without the country level variables.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix

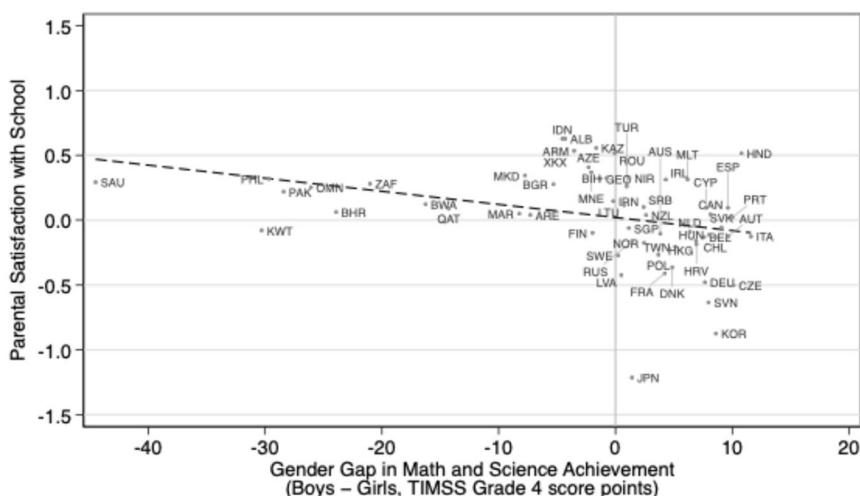


Figure A1. How education inequity relates to citizen satisfaction.

Country codes: ALB=Albania; ARE=United Arab Emirates; ARM=Armenia; AUS=Australia; AUT=Austria; AZE=Azerbaijan; BEL=Belgium (Flemish); BGR=Bulgaria; BHR=Bahrain; BIH=Bosnia and Herzegovina; BWA=Botswana; CAN=Canada; CHL=Chile; CYP=Cyprus; CZE=Czech Republic; DEU=Germany; DNK=Denmark; ESP=Spain; FIN=Finland; FRA=France; GEO=Georgia; HKG=Hong Kong SAR; HND=Honduras; HRV=Croatia; HUN=Hungary; IDN=Indonesia; IRL=Ireland; IRN=Iran, Islamic Rep. of; ITA=Italy; JPN=Japan; KAZ=Kazakhstan; KOR=Korea, Rep. of; KWT=Kuwait; LTU=Lithuania; LVA=Latvia; MAR=Morocco; MKD=Macedonia, Rep. of; MLT=Malta; MNE=Montenegro; NIR=Northern Ireland; NLD=Netherlands; NOR=Norway; NZL=New Zealand; OMN=Oman; PAK=Pakistan; PHL=Philippines; POL=Poland; PRT=Portugal; QAT=Qatar; ROU=Romania; RUS=Russian Federation; SAU=Saudi Arabia; SGP=Singapore; SRB=Serbia; SVK=Slovak Republic; SVN=Slovenia; SWE=Sweden; TUR=Turkey; TWN=Chinese Taipei; XKX=Kosovo; ZAF=South Africa.

Table A1. Factor analytical results of parents', students', teachers' evaluation items.

Parents survey items	Factor loading
My child's school does a good job including me in my child's education	0.73
My child's school provides a safe environment	0.65
My child's school cares about my child's progress in school	0.81
My child's school does a good job in helping him/her become better in reading	0.83
My child's progress is carefully monitored by the school.	0.85
My child's school does a good job in helping him/her become better in mathematics	0.83
Eigenvalues	3.7
Cronbach's alpha	0.87
Student survey items	
I like being in school	0.77
I feel safe when I am at school	0.79
I feel like I belong at this school	0.78
Eigen Values	1.83
Cronbach's alpha	0.68
Teacher survey items	
I am content with my profession as a teacher	0.83
My work full of meaning and purpose	0.82
I am enthusiastic about my job	0.88
my work inspires me	0.88
I am proud of the work I do	0.83
Eigen Values	3.59
Cronbach's alpha	0.9

Table A2. Summary statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Student and parent models</i>					
Student satisfaction	466,366	86.27	15.28	28	100
Parent satisfaction	462,423	87.85	12.82	28	100
Public service inequity	478,122	2.10	27.36	−212.88	214.15
Female student	478,122	0.50	0.50	0	1
Parent involvement	478,122	0.07	0.94	−2.62	2.03
Student performance	478,122	509.23	96.14	21.24	805.29
School performance	478,122	504.31	76.25	115.09	736.07
Immigrant status	478,122	0.11	0.31	0	1
Female teacher	478,122	0.84	0.37	0	1
Teacher experience	478,122	17.62	11.14	0	60
Parent highest occupation	478,122	3.66	1.46	0	5
Home support	478,122	1.48	0.65	0	2
Student SES composition at school	478,122	0.82	0.78	0	2
School location	478,122	2.41	1.29	0	4
Gender gap index	478,122	0.70	0.06	0.55	0.85
<i>Teacher model</i>					
Teacher satisfaction	23,814	86.95	13.85	25	100
Public service inequity	23,814	2.14	29.14	−212.88	214.15
% Female teachers	23,814	88.96	20.12	20	100
Gender gap index	23,814	0.72	0.06	0.55	0.85
% Female students	23,814	49.63	12.72	2.70	100
Parent involvement	23,814	0.05	0.94	−2.62	2.03
School performance	23,814	507.75	70.18	115.09	736.07
Female teacher	23,814	0.89	0.31	0	1
Teacher experience	23,814	17.09	11.06	0	60
Student SES composition at school	23,814	0.85	0.80	0	2
School location	23,814	2.35	1.30	0	4

Table A3. Robustness check: Results from multilevel models with country-level variables.

DV: Parent satisfaction	Random constant		Random intercept	
	Lower SES	Higher SES	Lower SES	Higher SES
Performance inequity	0.004*** (0.001)	0.005*** (0.001)	0.004*** (0.001)	0.004*** (0.001)
Female student	0.332*** (0.056)	0.447*** (0.051)	-0.002 (0.002)	-0.007*** (0.002)
Performance inequity × Female student	-0.002 (0.002)	-0.006*** (0.002)	0.332*** (0.055)	0.451*** (0.051)
Parent involvement	0.437*** (0.034)	0.657*** (0.032)	0.443*** (0.034)	0.649*** (0.032)
Student performance	0.009*** (0.000)	0.011*** (0.000)	0.009*** (0.000)	0.011*** (0.000)
School performance	-0.001 (0.001)	0.003*** (0.001)	-0.001* (0.001)	0.002*** (0.001)
Immigrant status	0.934*** (0.109)	0.604*** (0.108)	0.914*** (0.109)	0.594*** (0.108)
Female teacher	0.534*** (0.080)	0.328*** (0.073)	0.513*** (0.080)	0.313*** (0.073)
Teacher experience	0.000 (0.003)	0.011*** (0.002)	0.002 (0.003)	0.011*** (0.002)
Highest parent occupation	-0.818*** (0.034)	-1.116*** (0.064)	-0.821*** (0.034)	-1.124*** (0.064)
Home study support	-0.078* (0.046)	-0.147*** (0.048)	-0.079* (0.045)	-0.152*** (0.048)
Student SES composition at school	0.297*** (0.042)	0.358*** (0.040)	0.292*** (0.042)	0.342*** (0.040)
School location	-0.374*** (0.024)	-0.427*** (0.023)	-0.370*** (0.024)	-0.420*** (0.023)
OECD	-0.600 (1.975)	-1.029 (1.592)	3.503 (3.091)	2.423 (2.222)
Labor force participation rate	0.134*** (0.029)	0.026 (0.026)	-0.003 (0.049)	-0.071* (0.042)
GDP per capita	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Trade	-0.013*** (0.005)	-0.038*** (0.004)	0.003 (0.007)	-0.024*** (0.006)
Total population, logged	-3.028*** (0.637)	-3.080*** (0.503)	-4.205*** (0.979)	-4.220*** (0.694)
Government expenditure on education	-1.770*** (0.095)	-1.600*** (0.082)	-2.437*** (0.125)	-2.096*** (0.108)
Infant mortality rate	0.226*** (0.044)	0.416*** (0.045)	0.249*** (0.072)	0.438*** (0.073)
Sex ratio at birth	45.754*** (15.341)	-57.331*** (13.069)	85.749*** (20.977)	-85.018*** (17.300)
Women Business and the Law index	0.142*** (0.020)	-0.017 (0.017)	0.307*** (0.032)	0.133*** (0.027)
Governance index	-1.286*** (0.498)	-1.022** (0.445)	-3.354*** (0.725)	-4.596*** (0.663)
Democracy index	2.957*** (0.293)	3.200*** (0.258)	2.095*** (0.477)	3.497*** (0.437)
Constant	79.158*** (21.085)	204.909*** (17.622)	52.453* (29.291)	246.714*** (23.250)
$\sigma_{country}$	1.842*** (0.126)	1.597*** (0.105)	-12.533*** (0.141)	-12.883*** (0.121)
$\sigma_{residual}$	2.455*** (0.002)	2.488*** (0.001)	2.453*** (0.002)	2.486*** (0.001)
$\sigma_{student}$			2.303*** (0.131)	1.904*** (0.123)
N	178120	231230	178120	231230

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$; standard errors clustered by countries; year fixed effects included but not reported.

Table A4. Robustness check: Results from regression models with country-fixed effects.

DV: Parent satisfaction	Lower SES	Higher SES
Performance inequity	0.004** (0.002)	0.005* (0.002)
Female student	0.332*** (0.089)	0.448*** (0.072)
Performance inequity × Female student	−0.002 (0.003)	−0.006** (0.003)
Parent involvement	0.436*** (0.060)	0.660*** (0.108)
Student performance	0.009*** (0.001)	0.011*** (0.002)
School performance	−0.001 (0.002)	0.003 (0.002)
Immigrant status	0.925*** (0.250)	0.602* (0.324)
Female teacher	0.539*** (0.123)	0.330** (0.132)
Teacher experience	0.000 (0.006)	0.011** (0.005)
Highest parent occupation	−0.818*** (0.108)	−1.115*** (0.131)
Home study support	−0.083 (0.082)	−0.148** (0.069)
Student SES composition at school	0.306*** (0.079)	0.359*** (0.094)
School location	−0.375*** (0.079)	−0.425*** (0.097)
Labor force participation rate	0.108 (0.164)	0.017 (0.139)
GDP per capita	−0.000* (0.000)	−0.000 (0.000)
Trade	−0.025 (0.026)	−0.045** (0.018)
Total population, logged	−19.698** (9.351)	−8.300 (7.914)
Government expenditure on education	−2.041*** (0.635)	−1.758*** (0.481)
Infant mortality rate	−0.043 (0.300)	0.376 (0.242)
Sex ratio at birth	81.367 (90.794)	−61.818 (76.159)
Women Business and the Law index	0.259 (0.177)	0.006 (0.146)
Governance index	−4.186 (2.699)	−2.176 (2.451)
Democracy index	5.121** (2.238)	4.019** (1.867)
Constant	277.310* (150.848)	288.449** (133.943)
R-Squared overall	0.1645	0.1311
N	178120	231230

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$; standard errors clustered by countries; year and country fixed effects included but not reported.