INSTITUTE OF DEVELOPING ECONOMIES

IDE Discussion Papers are preliminary materials circulated
to stimulate discussions and critical comments

IDE DISCUSSION PAPER No. 734

Male Students' Augmented Underperformance with Teacher-Perceived Gender Stereotypes as Score Markers: Natural Experimental Evidence from Rural Philippines

MASAYOSHI OKABE*

January 2019

Abstract
Schoolboys in the Philippines are said to be underperforming in human capital accumulation, particularly education, compared to their female counterparts, especially in rural regions. Although existing literature has analyzed the sources of this bias, further research is required to understand its background. Thus, by combining our unique primary data from our own field survey using tailored questionnaires conducted in Marinduque Province and administrative data on the National Achievement Tests (NATs), we compare sources of the persistence of a negative male effect on test scores. We avail of the variations of blindness in rating systems between the NATs and teacher-rating report cards (RCs). Results of sensitivity analysis in regressions support the hypothesis that male students are systematically more likely to receive lower scores when they are evaluated in a non-blind rating system in which teachers know who the examinees are. The paper empirically presents an insightful perspective about Filipino schoolboys' underperformance being further augmented through gender stereotypes perceived by the evaluators, in this case, the school teachers.

Keywords: Male-effect Heterogeneity; Supply-side Bias; Test Scores; Human Capital; Philippines
JEL classification: D91; I21; I24; I25; I32; J16; O15; O53

* Overseas Research Fellow (Manila) IDE; Visiting Research Fellow, School of Labor and Industrial Relaations, University of the Philippines Diliman (masayoshi_okabe@ide.go.jp)

The Institute of Developing Economies (IDE) is a semigovernmental, nonpartisan, nonprofit research institute, founded in 1958. The Institute merged with the Japan External Trade Organization (JETRO) on July 1, 1998. The Institute conducts basic and comprehensive studies on economic and related affairs in all developing countries and regions, including Asia, the Middle East, Africa, Latin America, Oceania, and Eastern Europe.

INSTITUTE OF DEVELOPING ECONOMIES (IDE), JETRO
3-2-2, WAKABA, MIHAMA-KU, CHIBA-SHI
CHIBA 261-8545, JAPAN

MALE STUDENTS' AUGMENTED UNDERPERFORMANCE WITH TEACHER-PERCEIVED GENDER STEREOTYPES AS SCORE MARKERS: NATURAL EXPERIMENTAL EVIDENCE FROM RURAL PHILIPPINES*

Masayoshi OKABE**

Institute of Developing Economies, Japan External Trade Organization (IDE-JETRO), Chiba, Japan; University of the Philippines Diliman, Quezon City, Philippines

January 2019

Abstract:

Schoolboys in the Philippines are said to be underperforming in human capital accumulation, particularly education, compared to their female counterparts, especially in rural regions. Although existing literature has analyzed the sources of this bias, further research is required to understand its background. Thus, by combining our unique primary data from our own field survey using tailored questionnaires conducted in Marinduque Province and administrative data on the National Achievement Tests (NATs), we compare sources of the persistence of a negative male effect on test scores. We avail of the variations of blindness in rating systems between the NATs and teacher-rating report cards (RCs). Results of sensitivity analysis in regressions support the hypothesis that male students are systematically more likely to receive lower scores when they are evaluated in a non-blind rating system in which teachers know who the examinees are. The paper empirically presents an insightful perspective about Filipino schoolboys' underperformance being further augmented through gender stereotypes perceived by the evaluators, in this case, the school teachers.

Keywords: Male-effect Heterogeneity; Supply-side Bias; Test Scores; Human Capital; Philippines

JEL classifications: D91; I21; I24; I25; I32; J16; O15; O53

---

* This paper is a part of the research output of the author's current term of the overseas research fellowship in the Philippines.

** Masayoshi Okabe: Overseas Research Fellow (Manila), IDE-JETRO; Visiting Research Fellow, School of Labor and Industrial Relations/Senior Lecturer, College of Education, University of the Philippines, Diliman (concurrent positions).

Contact at: +63–921–621–4290; Masayoshi_Okabe@ide.go.jp; Masayoshi.Okabe@upd.edu.ph.

ACKNOWLEDGMENT

I wish to express my appreciation to the 2016 research grant program (program ID: D16-R-0798) funded by the Toyota Foundation (*Toyota Zaidan*), Tokyo, Japan (Grantee: Masayoshi Okabe, with the accepted research title: "A Socioeconomic Analysis on Reversed Gender Disparity in Education from Development Studies Perspective: A case from the Philippines") for much of my fieldwork activities. I am indebted to Yasuyuki Sawada, the Chief Economist and Director-General, Asian Development Bank and Professor, University of Tokyo, for his invaluable suggestions on the issue setting of the current study. It is under my terms as overseas and visiting research fellow that I have been able to commit long-term preparations and household survey in a rural area in the Philippines till now. I thank the faculty of the University of the Philippines Diliman's School of Labor and Industrial Relations (UP-SOLAIR) for hosting me (among others, to Maragtas Amante, Ronahlee Asuncion, Emily Cabegin, and Rebecca Gaddi) and the IDE-JETRO (among others, to Takesi Aida for suggesting an empirical approach, Tomohiro Machikita for continuous advice, and Momoe Makino for insightful comments on time-allocation survey designs). In addition, I received invaluable cooperation from the local people of Marinduque Province in the Philippines (among others, Ms. Lolita Natal and Mr. Delfin Natal Jr). The administrative data of score information of the National Achievement Tests (NATs) was provided by the Bureau of Education Assessment (BEA), Department of Education (DepED). Special thanks go to the BEA-DepED (particularly its specialist Ann Legarte and its statistician Ricky Totañes). A part of this study was presented at the 4th Philippine Studies Conference in Japan, held at Hiroshima University, Japan, on November 18, 2018, and I thank Kim Allen, Takeshi Kawanaka, and other participants who gave me comments and suggestions. All possible and potential errors are solely on the author, and the contents and discussions in the current paper do not represent those of any third parties, including the author's affiliations.

CONTENTS

TABLES

FIGURES

I. INTRODUCTION

The long-standing significance of empowerment of females in developing countries is undoubtable, as women in these parts of the world have been lagging behind their male counterparts in reaping the benefits of human development. This global issue has continued to require the mobilization of human wisdom. However, in some developing countries, an issue has begun to remerge regarding boys' underperformance in education[2] compared to their female counterparts (UNGEI, 2012).

UNGEI (2012) directly highlights this issue with cases in four East and Southeast Asian countries: the Philippines, Thailand, Malaysia, and Mongolia. It determined boys' underperformance from indices not only of access to education but also of quality or outcomes of education. Furthermore, Cambodia and Bangladesh, referred to as even lower income countries than UNGEI's (2012) four countries, have also been reported as regions where females have started to overtake their male counterparts in education (Zimmermann and Williams, 2016; Asadullah and Chaudhury, 2009; Khandker et al., 2003).[3]

Outside the Asia and Pacific region, the same issue has been found in some Latin American countries (Kitamura, 2015). Surprisingly, though it is considered a patriarchal region, some Sub-Saharan African countries such as Lesotho and Malawi are reported to have experienced the same situation (Jha et al. 2012). These were reported with some sense of astonishment, whereas the school subject-based underperformance of one gender has been reported in developed countries (OECD, 2014).

If the boys' underperformance in education merely meant the catch-ups of girls in those regions over time, we could interpret it as female outperformance of males, which is welcome. However, the situation is not that optimistic. Difficulties and barriers specific to male children have not been studied as much as in female cases (UNGEI, 2012). The literature dealing with boys' issues is still developing, as the issues are "a more complex phenomenon than female disadvantages" in education because the male issue "coexists with higher social and economic positioning, and privileging within family" (Jha et al. 2012: 12). The issue leading to male underachievement in human capital accumulation processes, if it emerges more broadly, not only poses an obstacle to males' own capability development but also can be of harm for women from a postfeminist perspective (Miralao, 2008).

---

[2] In this paper the author uses the term "'boys' underperformance' in education." The terms "underperform" and "boy" rather than "male" or "man" are derived from the terminology used by UNGEI (2012).

[3] According to Asadullah and Chaudhury (2009) and Khandker et al. (2003), the Bangladeshi government introduced an affirmative action called the female secondary stipend (FSS) program in 1994, which has been reported to increase girls' secondary education.

This paper attempts to explore the source and background of the phenomenon in the Philippines under conditions of poverty. This research idea serves to address why boys from poorer families are more underperforming in education. The Filipino boys' case of underperformance in education is persistent (Torres, 2011; UNGEI, 2012). Considerable literature has approached the issue from socioeconomic (demand-side) aspects. Keeping attention on the socioeconomic circumstances of students, this paper employs our latest primary data collected in a rural area in the Philippines to intentionally focus on a supply-side bias to the students through school teachers' perceived gender stereotypes. Thus far, gender disparity in education is regarded as being less serious in the Philippines (Fuwa, 2014). This paper, therefore, attempts at contributing to the literature by providing explanations of a supply-side factor in the case of a relatively and *seemingly* gender-neutral society and by presenting the complexity of this contentious issue as described in Jha et al. (2012).

II. LITERATURE REVIEW

This section reviews the related literature on the possibility of teacher-perceived gender stereotypes as one of the predictors of boys' underperformance in education. First, to organize the issue, this section first reviews the previous literature that has worked on how teacher- and school-related supply-side factors influence the disparities in educational achievement and outcomes among students aside from the demand-side factors such as the socioeconomic status (SES) of the students' households.

The bottom line from the literature first depends on whether the setting is a developed or developing country. In the latter, demand-side factors such as SES have been known as more explanatory of the disparities of educational achievement than supply-side factors. Of the supply-side factors, exceptions include teacher-related variables, which have more explanatory power than others (Hanushek and Woessmann, 2017).

Supply-side teachers' factors, such as perceived stereotypes of a certain gender, if any, are therefore thought to be a heterogeneous bias on how they rate and evaluate students of each gender differently. Let us confirm the possibility in which the rated educational performances of students can be influenced differently based on their gender even if they are in the same school environment. Then, teacher-perceived stereotypes can also be classified as a sequence of the determinants of academic performance disparities.

A. *On Supply-side Attributes as a Source of Disparities in Education*

It has been called into question what the source of disparities in access to education

and educational outcomes across individuals is, not only limited to gender disparities but also in general. A dichotomy between demand and supply sides of education is a primary and straightforward framework. On one hand, it was believed that the school attributes as supply-side factors served as a key predictor of educational outcomes of students. Heyneman and Loxley (1983) argued that in developing countries, school- and teacher-related variables accounted for a greater proportion of variance of student achievements than demand-side (individual- and household-level) SES did. It was called the "HL effect" (Huang, 2010). This was offset by the so-called Coleman Report, which reported low explanation powers of school-resource attributes for educational outcomes of students in the United States (Coleman et al., 1966). Relationships between demand- and school-side factors on educational outcomes have then been a big issue in related fields (Baker et al., 2002; Bouhlila, 2015; White, 1982).[4]

Nonetheless, later literature seems to converge toward denial of the HL effect.[5] It admits the demand-side SES in developing countries accounts for much more than the supply-side variables[6] (Hanushek, 2006; Hanushek and Woessmann, 2017). The pros and cons of the HL effect have still been a central question in the fields of education and development because the supply-side variations are the (possibly only) policy variables on which governments can intervene directly by arranging educational improvement through public policies.[7] A more recent study by Hanushek and Woessmann (2017) surveyed the

[4] Some scholars do not sufficiently emphasize the supply side factors but place considerable importance in demand side factors. There emerged a controversy regarding Heyneman (1989) and Riddell (1989a and 1989b) in a developing country setting.

[5] For example, Baker et al. (2002) conducted a comparative analysis of over 29 developing and developed countries using the Trends in International Mathematics and Science Study [TIMSS] ; Riddell (1997) for cases of Botswana, Brazil, Columbia, Egypt, Honduras, India, Jordan, Namibia, Pakistan, the Philippines, Thailand, and Zimbabwe; Huang (2010) for the Philippines; Bouhlila (2015) confirming Baker et al. (2002) for the TIMSS case in the Middle East and North African (MENA) countries. Meta-analysis covering 96 studies on the school-side effects on educational outcome found inconsistency in the explanation powers of the school-side variables in developing countries (Hanushek, 2006).

[6] Regarding the background of a weakened and vanishing HL effect, Baker et al. (2002) interpreted that "[i]nvestment in mass schooling by nation-states and multilateral agencies, backed by an ideology of providing some minimum level of school quality throughout the nation, has shifted the potential toward greater direct family SES effects in the social stratification process," "[t]he macroprocess of mass schooling across a large part of the world may have achieved a resource threshold in the quality of schooling," and "[t]his is one very plausible explanation for a shifting HL effect over time" (Baker et al. 2002: 310).

[7] I do *not* mean that demand-side–centered interventions of governments to livelihoods of poor students and families, e.g., school subsidy programs, are not a policy option to contribute to educational improvement. Here, it must be noted that the betterments of access to education and of quality of education differ from each other.

later literature and confirmed the same trends that the surveyed studies found regarding little significant explanatory power of the supply-side attributes, with exceptions such as the attributes of school teachers.

In the literature, variations of school-side factors have been gauged as overall effects that are homogeneous for male and female students. Yet, the supply-side factors can be transvalued if introducing the perspective of heterogeneity of the ways in which supply-side factors influence different groups of students. In the context of the current study, the interactions of gender-based stereotypes are thought to be one of such typical heterogeneous examples.

B. *Teachers' Stereotypes or Bias that Teachers Have toward Some Students*

School teachers are almost always near their students. As confirmed in Subsection A of this section, teachers' variations are said to be an exceptionally stronger predictor than other school-related inputs (Hanusheck and Woessmann, 2017). At the same time, teachers are also occasionally reported to perpetrate stereotyping, which in turn affects students' educational outcomes (Lavy, 2008; Torres, 2011; UNGEI, 2012). Emerging literature by Lavy (2008) and its successors, such as Cornwell et al. (2013) and Lavy and Sand (2018), opened a new approach to empirically study the effect of teachers as a source of stereotypes perceived against some students. Teachers had already been thought by educational psychology to be the source of unfavorable stereotypes of female students in particular school subjects such as math (Dusek and Joseph, 1983; Riegle-Crumb and Humphries, 2012; Tiedemann, 2000; Tiedemann, 2002).

Lavy (2008) deals with an Israeli case and Cornwell et al. (2013) with a US case and find such teachers' stereotypes treat male students more unfavorably than females. In turn, Lavy and Sand (2018) studied the same Israeli case by more directly focusing on the consequences of such stereotypes on female students' progress in the advanced science track in senior high schools and find that there are unfavorable stereotypes for female progress to the advanced tracks. Unfavorable female stereotypes are also found consistently in a French case (Terrier, 2015) and an Italian case (Carlana, 2017). As every study states, the direction toward females is strongly observed on the science track since it has been believed that math and sciences are male-dominated subjects in general (OECD, 2014).

Yet, these studies tested cases mostly in developed countries.[8] In developing

[8] The term "developed countries" is gauged here as OECD member countries. Israel is one. Based on the literature survey by Lavy and Sand (2018), the applications of the initial study by Lavy (2008) range from teachers' gendered stereotypes to racial discriminations in UK high schools

countries, there are few studies of the case. Data accessibility is possibly one of biggest obstacles because the documentation storage methods of schools and central governments differ greatly from those of developed countries. It can also fall afoul of privacy issues. However, given that the Philippines is one emerging country where boys' underperformance is prevailing, it is highly relevant to study this by applying the aforementioned research framework to the country.

C. *Philippine Settings*

A desk review by Torres (2011) lists concerns regarding Filipino boys' underperformance in education: higher dropout rates; earlier linkage to economic activities; lower functional literacy rates; and lower scores across subjects and on NATs. She also mentions that Filipino boys are prone to be victims of corporal punishment. Some mode like *hidden curriculum* in classrooms can also unconsciously be exercised in an explicit curriculum but can be perceived to be a certain mode of messages by learners like prejudicial.

According to the UNGEI (2012), teachers are described as a stereotyping factor. Torres (2011) warns that the school environment nature is not gender-neutral in the Philippines and stereotypes impede boys' potential and achievement in education. She adds that the teachers' perceived stereotypes in a school environment are often perpetuated by inadequate male role models and guidance process (e.g., due to lack of male teachers). However, what has been lacking is data, particularly data disaggregated by gender, regional and geographical locations, socioeconomic background, and ethnicity. Without this data, the existence of stereotypes and bias embedded in learning environment remains hardly tested.

It is then good to question whether the stereotypes are a source of the Filipino boys' persisting underperformance in education. In the HL effect literature, the country was not included in the developing countries that Heyneman and Loxley (1983) studied. Later, Riddell (1997) included the Philippines in her case studies and showed that the HL effect was not confirmed in the Philippine case along with cases of Botswana, Brazil, Columbia, Egypt, Honduras, India, Jordan, Namibia, Pakistan, Thailand, and Zimbabwe. Huang (2010) also denied the HL effect by employing the household survey that was conducted by the government in Cebu, Philippines, through closed analysis to Riddell (1989a). Yet, as said by Hanushek and Woessmann (2017), teachers are one exceptional variable in testing the HL effect.

(Burgess and Greaves, 2013), discriminatory influences on black students in Brazilian schools (Botelho et al.,2015), and foreign students in Swedish high schools (Björn et al. (2011)

D. *Reinforcements by Local Representations through Field Observations*

Our observations in the fields also confirm that some male youths can be stereotyped by adults including teachers (see also a Western Visayas case in Okabe, 2018). For example, the inclination of male youths to be lazy was often raised by local adults as a primary reason why they think male youths tend to lag behind their female counterparts in education. More surprisingly, not few mothers that we encountered in our current study area in Marinduque boldly stated that their sons had low IQs (intelligence quotients):

—"*Oo naman, tamad nga kasi ang mga lalaki namen*." (Yeah certainly, because our boys are lazy.)
—"*Mababa din kasi ang IQ nila*." (In addition, because their IQ is low.)

According to them, however, the sons' IQs had not ever been actually measured. Our interviewees, public school teachers, added that male students were much more out of their control in classes. They described that some male students came to be much more violent as they grew.

By combining the above related perspectives from the literature and some local representations and observations, this study aims to fill the literature gap by working on the question on the gender-heterogenetic stereotypes from school teachers, which has not been satisfactorily addressed so far. The local representations provided an eloquently reinforced hypothesis that the adults' perceptions can sometimes be a negative bias against youths.

The structure of the paper is as follows: Section III provides the data, explaining the choice and characteristics of research site, the sampling technique, and the collected information. Section IV explains our analytical framework and empirical analysis. Section V shows the research results, by beginning with the benchmark results then reaching some additional analyses for robustness checks. Finally, Section VI spells out the conclusion and limitations for future study. Appendices I and II provide some supplementary information for the readers' references.

III. DATA

A. *Research Site and Sampling*

The data employed in the current study comes from our tailor-made questionnaire-based household survey. The data collection was prepared from August 2017, and then the household survey was intensively conducted from January to March in 2018. Approximately

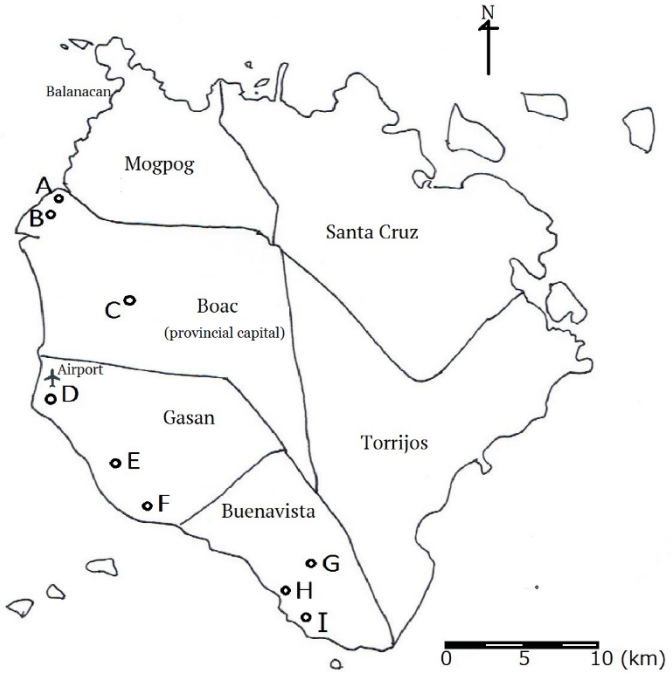
150 households with information of around 300 children were covered from nine *barangay*s (the local government unit in the Philippines) in three municipalities, say, Boac, Gasan, and Buenavista, in the Province of Marinduque (see Fig. 1 and Fig. 2). The municipalities, *barangay*s, and households were randomly chosen through the stratified random sampling technique based on the master list from the *Community-based Monitoring System* (CBMS) that the local government units provided.[9]

Figure 1: Location of Marinduque Province on the National Map

Source: Adapted from http://www.freemap.jp

[9] In August 2017, the author paid courtesy calls to every municipality hall to see mayors/representative of three municipalities. In this occasion, the *barangay* lists were collected from the municipalities. The collection of CBMS information at a *barangay* level was also helped by the author's local counterparts.

Figure 2: Provincial Map of Marinduque



Notes: The circles A–I represent the nine sampled barangays.

Source: Hand-drawn by the author.

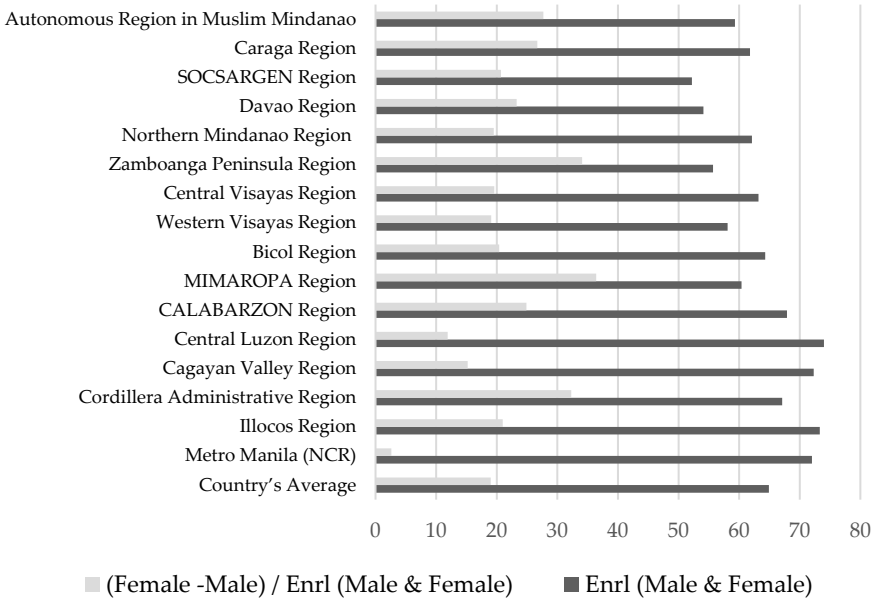
Marinduque Province belongs to the Region IV-B (MIMAROPA). Because Filipino male youths start to lag behind females typically in secondary-level education, one of the regions with the largest gender gap in access to secondary-level education was first chosen. It is the Region IV-B, called MIMAROPA Region (Fig. 3). According to Fig. 3, male youths lag behind their female counterparts more in rural regions outside of Luzon Island than regions on Luzon Island. The regions in MIMAROPA, Visayas, and Mindanao are opposition to Metro Manila and Central Luzon where boys' underperformance is much less severe.

Region IV-B, MIMAROPA, used to be referred to as the Southern Tagalog Region. Marinduque Province is considered the geographical center of the Philippine archipelago; it is a heart-shaped island with a total land area of 952.58 square kilometers (Gaddi, 2018). The municipality Gasan is where *purok* Quatis in the barangay Masiga (the circle D in the Fig. 2) can be found.[10] The *purok* Quatis has been the author's research stronghold, whereby our preparatory fieldworks and observations and data collection works, including dry runs of questionnaire survey, have been spread to the other sites in order. There are no major cities

[10] A *purok* is a Filipino term meaning a district within a *barangay*.

in Marinduque Province, which is comprised of only municipalities. Most of our study *barangay*s are remote from *poblacion*, referring to central and commercial zones, in each municipality. Out of nine *barangay*s, two *barangay*s are classified as *poblacion* in two municipalities.

Figure 3: Gender Disparities in Net Enrollment Rates at the Secondary Level



Note: "(Female–Male)/Enrl(Male & Female)" means the proportion of differences of female-to-male enrollment rates over the total enrollment rates. "Enrl(Male & Female)" means the total enrollment rates of both males and females.
Source: FLEMSS 2013, PSA.

Marinduque's regional economy depends on primary industries such as agriculture (mainly *palay* [paddy rice] and coconut), horticulture (vegetables), and fishery. It also depends on craftworks and micro-business. The province's economy is outstanding in the regional and national contexts in terms of the dominance of self-employment (Table 1). According to Table 1, the occupational rate of self-employment is dominant, reaching 45.80% in Marinduque Province compared to 37.42% in the MIMAROPA Region and 32.94% on average nationally in rural areas. The province's high self-employment rate comes at the expense of the rate of private establishment, which is much lower in the province at 26.72% than the regional and national rural averages of 34.24% and 38.11%, respectively. These imply that the private firm-driven sectors are, by and large, yet far from developing in the

province. In exchange of its underdeveloped private sector, the governmental (public) sector absorbs more workers than regional and national rural average.[11]

Table 1: Industrial Characteristics of Marinduque Province in Regional and National Contexts (%, 2015)

Occupation Categories	National		Region	Province
	Urban	Rural		
Private household	6.66	4.38	4.43	4.58
Private establishment	53.30	38.11	34.24	26.72
Governmental corporation	9.38	8.62	9.62	12.21
Self-employed	23.08	32.94	37.42	45.80
Employer	2.64	4.73	4.31	1.53
With pay (family-owned business)	0.43	0.29	0.46	0.00
Without pay (family-owned business)	4.51	10.94	9.53	9.16
Number of observations (persons)	28,814	49,734	2,392	262

Note: Region = MIMAROPA region (Region IV-B); Province = Marinduque province.

Source: LFS 2015, PSA.

B. *Collected Information*

Our intensive survey collected information in the three categories: (1) individual characteristics of the sampled children who are mainly teenaged/in high school, (2) schooling and education profiles of the children, (3) basic information about their families, and (4) time-allocation patterns of two selected children per household. (1), (2), and (4) were directly asked to the children (siblings), whereas (3) was asked to one of their parents or grandparents (adult guardians). In a few cases where the guardians were not available at the timing of our household survey, relatives (uncles/aunts or grandparents) responded on their behalf. A detailed summary of variables in the empirical analyses is presented in Appendix I.

The first category, children's characteristics, is a set of data that includes names, sex, birthday, birth order, and number of siblings. The second category is regarding enrollment status and school-related information if enrolled or reasons for quitting schooling if not

[11] In this sense, Marinduque Province is similar to Bukidnon Province (which Chapters 2 and 3 discuss) in terms of the nature of underdevelopment of private sectors within the provincial economy and in the correspondingly substituting role by the public sector.

enrolled. For the third category on basic family information, we collected the demographic, educational, working, and earning information of parents, including the home addresses. These deserve control variables and are reported in summary statistics in Appendix I.

The fourth category, a time-allocation survey, is a collection of the allocations of (1) home time and (2) working time, based on classifications of Lam and McHale (2015). It collected daily information for a week (7 days) to attempt to mitigate time-variant incidents and then collect information based on their usual (average) patterns of activities.[12] The home time includes sleep/rest and leisure activities such as playing. The children's working time in a day includes studying at home and laboring for family members (e.g., helping with parents' work and household chores). Combining the classifications of activities by Lam and McHale (2015) in our own preliminary observations as to how the children spend their time every day, the questionnaire of daily activities (like a diary) was semi-structured, meaning that most of the questionnaire was structured while leaving an unstructured (free-style) part.

In the structured part, the children were asked how much time (in minutes) they spent on the following activities: sleeping, schooling, helping their father and mother with their respective work, household chores, studying at home, playing outside/with friends, and going to a computer game shop. They were also asked the number of times they attended schooling in a week (namely, number of absences). In the unstructured part, we asked what other activities they did and for how long, if at all (free description).[13] The questionnaires were self-administered. After collecting the filled questionnaires in 7 days, the author checked if there were unclear parts to modify. If critical contradictions and/or completely unclear answers were found, we did not allow the survey to be completed and asked the

[12] Each set of questionnaire consists of seven sheets, from the first to the seventh day. Although the start date of the first day is not shared across individuals, the date of the first day was recorded in the questionnaire sheet to control for timing variations as well as to identify whether it was a working day or weekend/holidays and to note the day of week (e.g., Sunday, Monday, etc.).

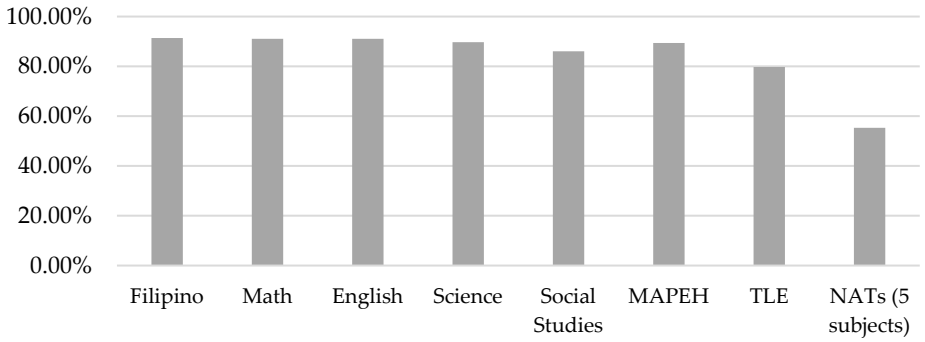
[13] As unstructured parts of activities, children could also report their extra activities such as *magsimba* (going to church to attend a Christian Mass particularly on Sundays) and out-of-school practices (e.g., group dance practices) and/or irregular events (e.g., funeral, marriage parties), if any. However, this information is not actually used for our quantitative analysis, because their answers seem to suffer from selection problem (a distinct difference between children who are providing detailed information and children who do not provide any information on these extra activities) and because interpretations of this information are difficult, both coming from the truncated response frequencies. The author checked and moved to the structured part if some of the activities reported in the free descriptions were indicated in structured parts. Nonetheless, there seems to have still remained an issue of selection. We lack judgment as to whether some children kept some activities reported and others unreported, but they actually did. Yet, the contents were very helpful to know and learn how and for what the youths in our sample spent their time qualitatively.

child to refill with the correct information. If minor errors were found, the author would manually check and correct these by contacting the children and conduct follow-up confirmations by additional contacts. The mean comparisons tell us that there are clearly gendered patterns in the time-allocation patterns (see Section D in Appendix I for details).

C. *Information of Test Scores*

The test scores of students were collected via the following two channels: direct interviews and administrative data provided by the government. The sample children were asked their latest scores on the teacher-based report card (hereafter, scores on RC) regarding seven school subjects: national language (Filipino), math, English, science, social studies[14], MAPEH (music, arts, physical education, and health), and TLE (technology and livelihood education). When asking about the RC scores, we carefully explained to each child using both an oral and written explanation that the collected information would be immediately encoded into numerical and anonymous data which would keep individuals unidentifiable, and their proper names would never appear in the analyses and results. This dedicated explanation let the respondents feel at ease to answer the questions and thus achieve high rates of response regarding RC scores (see Fig. 4).

Figure 4: Response Rates of RC Scores (by subjects) and Tracking Rate of NATs Scores



Note: The rate of scores on NATs is based on the number of students who are in Grade 7 or above.
Source: Author's own calculation.

In turn, the score information of NATs was provided as the administrative data by

[14] It is locally called HeKaSi or *Araling Panlipunan*. The former initials the *He*ograpiya, *Ka*saysayan *at Si*bika, meaning Geography, History, and Civics, and the latter means the social studies (*aralin* means study, -(*n)g* serves as a linker connecting with another word, and *panlipunan* means social).

the national government (DepED) with respect to the same children in our sample who are in or above the seventh grade (students lower than grade 6 do not yet have their own NAT scores). The office in charge is the BEA in the DepED, and we made a formal request to the office for the NAT data. The BEA-DepED took a considerably long time to try tracing the sample students listed in the request before finally providing us with the NAT score data of 55% of the children from our sample children. The NAT is the Nationwide Achievement Test supervised by the DepED comprising five subjects: Filipino, English, math, science, and social studies (HeKaSi or *Araling Panlipunan*).

Table 2: Descriptive Statistics of *z* Scores on RC and NATs

Scores and Subjects	Obs	Female (F)	Male (M)	Δ(F - M)
Non-blind score (RC)				
Filipino	275	0.34	-0.38	0.72
Math	274	0.26	-0.30	0.56
English	274	0.40	-0.47	0.87
Science	270	0.33	-0.39	0.72
Social Studies	259	0.34	-0.38	0.72
MAPEH	269	0.32	-0.38	0.71
TLE	240	0.28	-0.35	0.63
Blind score (NAT)				
Filipino	135	0.00	0.00	0.00
Math	135	-0.01	0.02	-0.03
English	135	0.04	-0.06	0.10
Science	135	0.04	-0.07	0.11
Social Studies	135	0.06	-0.10	0.16

Notes: MAPEH = Music, Arts, Physical Education and Health; TLE = Technology and Livelihood Education.

Source: Author's own calculations.

Both RC and NAT scores are standardized into *z* scores: $z_{iS} = (R_{iS} - \overline{R_S})/s_S$, where R_{iS} means the individual percentage scores of child i, the $\overline{R_S}$ is the mean score of the subject set S, and s_S means the standard deviations of the subject set S. The raw scores on RC are rated as if they had the nonzero minimum score because they range mostly from 75 to 100, unlike the raw percentage scores on NATs that can range from 0 to 100, due to the education system of the Philippines. Scores on RC contain information through which teachers provide

evaluation, that is, "fail," if under 75 or "pass," if above 75. Those students who performed really poorly enough to be judged as "failure" (a factor to repetition) would get scores on RC lower than 75 (but this proportion is actually low). The standardization into *z* scores is useful in this sense that it will be more comparable across the scores from different tests and exams. Theoretically, the mean values of *z* scores take zero. The difference from zero is interpreted as a size of standard deviation (SD).

Table 2 shows the descriptive statistics of z scores on NATs and on RC by school subject. Obviously, male students receive lower scores on RC (non-blind scores) across all subjects. The gaps between male and female averages range from 0.56 SD for math to 0.87 SD for English. This means that even in math, which is generally assumed to be a subject that male students perform better at, male students are underperforming compared to their female counterparts.

Intriguingly, the scores on NATs show much smaller gender gaps in contrast to the RC scores. The gaps are largest in social studies with a 0.16 SD size and smallest (not detected) in Filipino with a 0.00 SD size. In math, the female students received slightly lower scores on average than their male counterparts. The mean comparisons deliver two key points: The gender gap is much more prominent on the non-blind scores than on the blind scores, and the subject-base variations are also large depending on the subject.

IV. EMPIRICAL ANALYSES

A. *Analytical Framework*

The rating system of NATs is conducted blindly and is done mechanically on the basis of numbers of questions correctly answered by external markers who do not know about the examinees. In contrast, the scores on RC are rated in a non-blind way by school teachers, who know about the evaluated (i.e., their students). The classification into "blind" and "non-blind" rating systems refers to what Lavy (2008) did. Applying the framework of Lavy (2008), who focused on the blind and non-blind rating settings of matriculation exams in Israeli public high schools, we hypothesize that the bias and perceptions of teachers toward some of their students, if any, will influence the rating of RC scores (non-blind scores) compared to NAT scores (blind scores). We also hypothesize that such stereotyping can be exercised even unconsciously and unintentionally by teachers. Lavy (2008) empirically regards the situation of having both blind and non-blind rating manners as a natural experimental setting where only the blindness in the evaluations changes and the blindness in the rating system is not a choice variable (i.e., examinees cannot choose or change the

blindness setting endogenously).

As expected, the mean comparisons shown in Table 2 exhibit larger gender gaps on RC scores but much smaller or insignificant gender gaps on NAT scores in the same school subject sets (Subsection C in Section III). Our research aims to examine the channel through which the boys' persisting underperformance in education can be explained by their evaluators, namely, their school teachers.

B. *Sensitivity Analysis in Benchmark Models*

To test the bias and stereotype, we rely on the regression analysis, not merely on two-dimensional comparisons of mean values and descriptive statistics, because the effect of being male should be interpreted as a marginal effect or partial derivative, where other possible variables are controlled at constant (ceteris paribus).

In particular, we explore the sensitivity analysis by which we check the extent to which the effect of variable of interest is sensitive or stable through various specifications as other explanatory variables are included. This approach is relevant to a proposed method in recent works by Oster (2017) or in the original works by Altonji et al. (2005) and Bellows and Miguel (2009). Oster (2017) propounds exploring the sensitivity of coefficient stability when and after other controls are additionally included in regression equations and the transitive changes in R^2, to examine the robustness of treatment effect in order to cope with the situation in which the observed variables do not fully capture the omitted unobserved characteristics. The discussions in Section II require incorporation of the SES variables as explanatory variables before supply-side factors. Therefore, by transitive changes from a very simple model to complex models where more SES-related covariates are controlled, our focus is on the persistence of the gender variable.

The econometric models are built as follows. To begin with, the simplest model is given by:

$$S_{ijs} = \alpha_{0js} + \alpha_{1js} M_i + e_{ijs}, \quad (1)$$

where the dependent variables S_{ijs} are the standardized z scores of the student i, on the test type j ={NATs, RC}, and the set of school subject areas s ={Filipino, math, English, science, social studies, MAPEH, TLE}; α_0 is the intercept; M_i is the male indicator taking 1 if the individual i is male and 0 otherwise. In Eq. (1), no covariates are controlled. [15] Table 3 shows the results. This simple regression reconfirms the results in Table 2.

[15] On the NATs, MAPEH and TLE are not examined.

Table 3: Single Regression of Male Effect on Scores by Test Type and Subject

	Filipino	Math	English	Science	Soc. Stu.	MAPEH	TLE
Scores on NATs:							
Male (=1)	0.12	0.34**	0.16	0.07	0.12	n.a.	n.a.
	[0.18]	[0.14]	[0.15]	[0.15]	[0.14]	n.a.	n.a.
Adj. R^2	0.08	0.41	0.35	0.36	0.37	n.a.	n.a.
No. of Obs.	128	128	128	128	128	n.a.	n.a.
Scores on RC:							
Male (=1)	-0.72***	-0.56***	-0.87***	-0.72***	-0.72***	-0.71***	-0.63***
	[0.11]	[0.12]	[0.11]	[0.11]	[0.12]	[0.12]	[0.12]
Adj. R^2	0.13	0.08	0.18	0.12	0.12	0.12	0.10
No. of Obs.	275	274	274	270	259	269	240

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

Notes: 1. Soc. Stu. = Social Studies; MAPEH = Music, Arts, Physical Education and Health; TLE = Technology and Livelihood Education.. Numbers in brackets are robust standard errors.

2. Coefficients of other covariates are omitted in this report for space and visual purposes.

Source: Authors' own calculation.

Then, we need to put the vector $\mathbf{X}$ containing individual characteristics and household-level SES. Appendix Table 1 provides the summary statistics of the dependent and independent variables, and Appendix I describes the variables that are used as covariates. Whereas these variables are gradually added as covariates into the regression models by specifications, the main part of this paper shall omit reporting the coefficients of the other covariates in the tables for the sake of space and visuality. The full report corresponding to the full model is available in Appendix II.

Next, we put some fixed effects in the models to further control for some unobservable factors: ρ denotes the school year (SY) effect capturing difficulty levels of NATs in each SY that can vary in some SYs; ω denotes the region-specific effect to control for unobservable heterogeneity across the *barangay*s; and φ denotes the school effect to control for unobservable heterogeneity in attributes of teachers and schools. Particularly, φ is decomposed into the overall part, φ^{all}, and the male-specific part, φ^{M} (i.e., $\varphi = \varphi^{all} + \varphi^{M}$). The model is now rewritten as:

$$S_{ijs} = \delta_{js} M_i + \mathbf{X_{ij}}\boldsymbol{\beta_{js}} + \rho + \omega + \varphi + u_{ijs}. \quad (2)$$

The idea of exploring sensitivity is like this: Expected signs of δs are negative, but when δs are negative, the extent of the persistence of δ is of our interest. If the individual characteristics and household-level SES already capture sufficiently the influences of being male, then the insignificant relation $\delta = 0$ can no longer be rejected. If the added covariates

do not yet capture them, δ is still expected to be statistically significant and negative. In turn, if the sources of male effect mainly include regional heterogeneity, δ will be indistinguishable from taking zero once the region-specific effects are controlled for. Likewise, if the teachers' in-school factors play highly as the source of male effect, here δ will be indistinguishable from taking zero once those school effects are controlled for. In sum, sensitive analysis allows to check the persistence of the male effect as other covariates and fixed effects are added in the specifications.

V. RESULTS

A. *Benchmark Results*

1. *Male effect when other individual and household characteristics are controlled*

To begin, Table 4 shows the result of regression analysis when individual and household characteristics are controlled as covariates. The male effects do not qualitatively change from the result of single regression in Table 3. The male effect is not detected on the scores on NATs, except for math where the male effect is positive, but it is robustly persistent on the scores on RC through all the subjects. Whereas male students perform well in math relative to their female counterparts on the blind scores, they underperform on the non-blind scores across all subjects including math, MAPEH, and TLE.

Table 4: Results of Sensitivity Analysis (Covariates = Individual/household characteristics)

	Filipino	Math	English	Science	Soc. Stu.	MAPEH	TLE
Scores on NATs:							
Male (=1)	0.00	0.29*	0.05	0.02	0.08	n.a.	n.a.
	[0.19]	[0.15]	[0.15]	[0.16]	[0.16]	n.a.	n.a.
Adj. R^2	0.23	0.49	0.46	0.44	0.47	n.a.	n.a.
No. of Obs.	128	128	128	128	128	n.a.	n.a.
Scores on RC:							
Male (=1)	-0.69***	-0.66***	-0.86***	-0.85***	-0.59***	-0.62***	-0.68***
	[0.17]	[0.17]	[0.15]	[0.15]	[0.18]	[0.16]	[0.17]
Adj. R^2	0.23	0.30	0.35	0.35	0.29	0.32	0.31
No. of Obs.	256	255	255	251	241	250	221

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

Notes: 1. Soc. Stu. = Social Studies; MAPEH = Music, Arts, Physical Education and Health; TLE = Technology and Livelihood Education.. Numbers in brackets are robust standard errors.

2. Coefficients of other covariates are omitted in this report for space and visual purposes.

Source: Authors' own calculation.

2. *Male effect when the region effect is additionally controlled*

Estimations in the results of Table 5 further add the *barangay*-level region effect to control for unobserved heterogeneity across the living places. The adjusted R^2 increases in all the subjects in Table 4, and so the regional heterogeneity has some explanation power on the scores. Yet, the patterns of marginal effect of being male on both scores remain persistent and are qualitatively the same as in Table 4.

Table 5: Results of Sensitivity Analysis (Covariates = Individual and household characteristics + Region effect)

	Filipino	Math	English	Science	Soc. Stu.	MAPEH	TLE
Scores on NATs:							
Male (=1)	0.00	0.29*	0.05	0.02	0.08	n.a.	n.a.
	[0.19]	[0.15]	[0.15]	[0.16]	[0.16]	n.a.	n.a.
Adj. R^2	0.21	0.50	0.46	0.43	0.45	n.a.	n.a.
No. of Obs.	128	128	128	128	128	n.a.	n.a.
Scores on RC:							
Male (=1)	-0.77***	-0.61***	-0.94***	-0.83***	-0.63***	-0.74***	-0.64***
	[0.15]	[0.13]	[0.13]	[0.13]	[0.15]	[0.14]	[0.15]
Adj. R^2	0.25	0.35	0.37	0.38	0.33	0.31	0.30
No. of Obs.	256	255	255	251	241	250	221

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

Notes: 1. Soc. Stu. = Social Studies; MAPEH = Music, Arts, Physical Education and Health; TLE = Technology and Livelihood Education.. Numbers in brackets are robust standard errors.

2. Coefficients of other covariates are omitted in this report for space and visual purposes.

Source: Authors' own calculation.

3. *Male effect when the school effect is additionally controlled*

Next, estimations in the results of Table 6 further add the school effect to control for unobserved heterogeneity on school attributes. As compared to Table 5, the positive male effect on math on the blind scores turns out to be insignificant here. Yet, the male effect still remains persistently negative through all subjects on the non-blind scores.

4. *Male effect when male-specific part of school effect is isolated and additionally controlled*

Furthermore, to isolate unobserved heterogeneity that can affect selectively on male students in schools, the male-specific part of school effect, φ^M, is set apart and added in the

equation. The results are shown in Table 7. There are two noteworthy changes in Table 7. First, the male effect on NATs (blind scores) here becomes positive once again for math and positive recently for English and science (in the upper stage of Table 7). Second, the male effect is consistently negative so far, but vanishes on scores on RC regardless of the subject (in the lower stage of Table 7).

Initially, there was minor gender difference on the scores on NATs when comparing the mean values. This has remained even after other individual- and household-level characteristics, unobserved heterogeneities across living places and schools, and some school year-specific difficulty levels are controlled at constant. However, once φ^M is also controlled, the male effect becomes positive on math, English, and science in Table 7.

Table 7 shows that, if φ^M, say, male-specific but directly unobserved environment for male students in schools, gets controlled at constant, being male alone would predict higher scores of math, English, and science on the NAT than their female counterparts. However, the estimation including φ^M indicated the "underestimation" of the male effect until the previous specifications without φ^M toward the direction to zero unless the former effect is controlled. Namely, some sort of within-school environment selectively to male students may be masking such potentiality of male students. In other words, the source of the considerable part of the negative male effect that has been persistently detected on the RC scores is in the schools.

Table 6: Results of Sensitivity Analysis (Covariates = Individual and household characteristics + Region effect + School effect)

	Filipino	Math	English	Science	Soc. Stu.	MAPEH	TLE
Scores on NATs:							
Male (=1)	-0.18	0.16	-0.07	-0.07	-0.01	n.a.	n.a.
	[0.20]	[0.16]	[0.17]	[0.17]	[0.15]	n.a.	n.a.
Adj. R^2	0.29	0.57	0.53	0.49	0.51	n.a.	n.a.
No. of Obs.	128	128	128	128	128	n.a.	n.a.
Scores on RC:							
Male (=1)	-0.69***	-0.66***	-0.86***	-0.85***	-0.59***	-0.62***	-0.68***
	[0.17]	[0.17]	[0.15]	[0.15]	[0.18]	[0.16]	[0.17]
Adj. R^2	0.28	0.29	0.38	0.40	0.25	0.30	0.29
No. of Obs.	236	235	236	231	221	231	207

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

Notes: 1. Soc. Stu. = Social Studies; MAPEH = Music, Arts, Physical Education and Health; TLE = Technology and Livelihood Education.. Numbers in brackets are robust standard errors.

2. Coefficients of other covariates are omitted in this report for space and visual purposes.

Source: Authors' own calculation.

Table 7: Results of Sensitivity Analysis (Covariates = Individual and household characteristics + Region effect + School effect + Male-specific School effect)

	Filipino	Math	English	Science	Soc. Stu.	MAPEH	TLE
Scores on NATs:							
Male (=1)	1.30	1.47***	1.29*	1.23**	0.87	n.a.	n.a.
	[0.82]	[0.55]	[0.71]	[0.49]	[0.66]	n.a.	n.a.
Adj. R^2	0.32	0.61	0.54	0.51	0.52	n.a.	n.a.
No. of Obs.	128	128	128	128	128	n.a.	n.a.
Scores on RC:							
Male (=1)	1.15	0.02	1.08	1.03	-0.77	0.39	0.14
	[0.83]	[0.92]	[0.75]	[0.78]	[0.90]	[0.99]	[1.00]
Adj. R^2	0.24	0.26	0.37	0.41	0.22	0.27	0.25
No. of Obs.	236	235	236	231	221	231	207

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

Notes: 1. Soc. Stu. = Social Studies; MAPEH = Music, Arts, Physical Education and Health; TLE = Technology and Livelihood Education.. Numbers in brackets are robust standard errors.

2. Coefficients of other covariates are omitted in this report for space and visual purposes.

Source: Authors' own calculation.

Likewise, on the teacher-based scores on RC, being male alone would no longer predict a negative or a positive consequence when controls include φ^M, regardless of the subject. Given the persistence of negative coefficients of being male until the previous specifications without φ^M, the male effect alone, until the previous specification, has been "underestimated" toward a downward direction from zero to negative. Eventually, the results in Table 7 consistently explain that the male-specific part of school effect represents a considerable part of the δs, say, male effect that was estimated to be persistently negative until the last specification. This finding further supports that the male students are selectively facing some sort of unfavorable bias in schools.

B. *The Same-student Comparisons by Subtracting Blind and Non-blind Scores*

The benchmark analyses in the previous subsection yield the results that the male students are significantly underperforming in the non-blind scores but are not doing so in the blind scores with various specifications to put additional controls. The results come from the separate estimations of the scores on NATs and on RC, respectively. Whereas the separate estimations indicate the features of each score, it is more straightforward to directly look at the differences between the two score of the same individuals. To do so, by taking advantage of statistical properties of standardized z scores, we subtract the scores on RC from the scores on NATs to get the differences and directly use the variable for regression analysis. This

subsection further explores the robustness checks of additional possible arrangements to test whether the obtained results drastically change qualitatively. The model rewrites:

$$\Delta S_{is} = \delta_s' M_i + \mathbf{X}\boldsymbol{\beta}_\mathbf{s}' + \rho + \omega + \varphi + u_{is}'. \quad (3)$$

where $\Delta S_{is} \equiv S_{i,RD,s} - S_{i,NAT,s}$. Each coefficient means:

$$\delta_s' = \delta_{RD,s} - \delta_{NAT,s} \text{ and } \boldsymbol{\beta}_\mathbf{s}' = \boldsymbol{\beta}_{\mathbf{RD,s}} - \boldsymbol{\beta}_{\mathbf{NAT,s}}, \quad (4)$$

where we are continuously interested in the significance and signs of δ_s'. If $\delta_s' \lessgtr 0$, then $\delta_{RD,s} \lessgtr \delta_{NAT,s}$.

Table 8 summarizes the descriptive statistics of ΔS, and the distributions of ΔS by school subjects are drawn in Fig. 5 for the visual information. The differences can only be calculated on the subsample whose scores on NATs were tracked. If $\Delta S_{iS} > 0$, it means that the individual i takes higher z score on RC on the subject S than that on NATs, and if $\Delta S_{iS} < 0$, it means vice versa. This Table 8 still shows that ΔS of female individuals are higher than ΔS of males across all five subjects.[16] It should be noted here that the properties of ΔS are not totally the same as z scores because $\Delta S_{is} \equiv S_{i,RD,s} - S_{i,NAT,s}$, not necessarily guaranteeing that the means of ΔS become zero and SDs of ΔS become one.

Table 8: Descriptive Statistics of the Differences between the Two Scores by Subject

Scores and Subjects	Obs	Female (F)	Male (M)	Δ(F - M)
Δ Score (RD - NAT)				
Filipino	125	0.35	-0.10	0.46
Math	123	0.30	-0.09	0.39
English	125	0.34	-0.12	0.46
Science	121	0.47	0.05	0.42
Social Studies	114	0.31	0.10	0.21

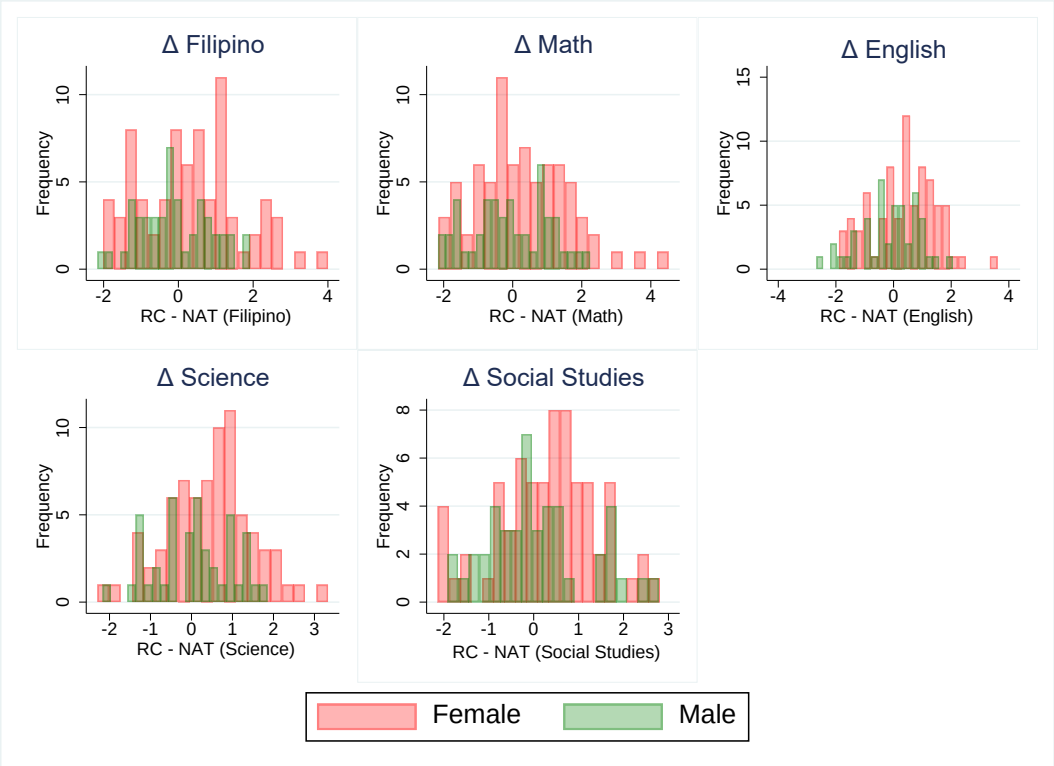
Source: Author's own calculations.

Table 9 displays the results of estimating ΔS as dependent variables by specifications similar to the ones in the benchmark analyses: Specification (1) is the single

[16] MAPEH and TLE are no longer available because these subjects are not examined in the NATs.

regression only with the male indicator, corresponding to Table 3. Specification (2) adds the individual and household characteristics as the covariates, corresponding to Table 4. Specification (3) further adds the region effect, corresponding to Table 5, and likewise, specification (4) additionally controls for the school effect, corresponding to Table 6. Finally, specification (5) adds the φ^M, corresponding to Table 7.

Figure 5: Distributions of Differences Between the Two Scores by Subject



Source: Author's own calculations.

Results in Table 9 show that the male effect in specifications (1) and (2) are significantly negative except for social studies. In turn, in specifications (3) and (4), the signs of male effect estimated remain significantly negative for English and science. Then, in specification (5), it is noteworthy that the male effects are detected as negative across all the subjects, including social studies.

Based on the logic in interpreting the transitive change from Table 6 to Table 7, the results from the benchmark analysis are qualitatively confirmed also by more straightforward estimations using the differences between the two scores and are the case for English and science. In contrast to the benchmark analyses of separate estimations, such

unfavorable treatments against male students remain or become negative across all subjects even when φ^M is controlled for.

Table 9: Sensitivity Analysis of Differences between Scores on RC and on NAT by Subject

Specifications	Filipino	Math	English	Science	Soc. Stu.
(1) Covariates = None					
Male (=1)	-0.47**	-0.40*	-0.51***	-0.45**	-0.28
	[0.20]	[0.22]	[0.19]	[0.19]	[0.20]
Adj. R^2	0.04	0.03	0.11	0.04	0.14
No. of Obs.	125	123	125	121	114
(2) Covariates = Individual, Household SES					
Male (=1)	-0.52*	-0.50*	-0.89***	-0.66***	-0.46
	[0.27]	[0.29]	[0.23]	[0.24]	[0.28]
Adj. R^2	0.17	0.19	0.22	0.17	0.22
No. of Obs.	118	116	118	114	107
(3) Covariates = (2) + Region effect					
Male (=1)	-0.43	-0.46	-0.87***	-0.64**	-0.42
	[0.30]	[0.33]	[0.25]	[0.25]	[0.30]
Adj. R^2	0.16	0.14	0.20	0.17	0.21
No. of Obs.	118	116	118	114	107
(4) Covariates = (3) + School effect					
Male (=1)	-0.29	-0.40	-0.81***	-0.79***	-0.44
	[0.31]	[0.37]	[0.28]	[0.26]	[0.33]
Adj. R^2	0.27	0.23	0.27	0.25	0.20
No. of Obs.	118	116	118	114	107
(5) Covariates = (4) + Male-specific School effect					
Male (=1)	-1.32*	-3.23***	-1.41**	-1.95***	-2.24***
	[0.76]	[0.70]	[0.69]	[0.57]	[0.66]
Adj. R^2	0.22	0.25	0.25	0.24	0.19
No. of Obs.	118	116	118	114	107

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

Notes: 1. Soc. Stu. = Social Studies. Numbers in brackets are robust standard errors.

2. Coefficients of other covariates are omitted in this report for space and visual purposes.

Source: Authors' own calculation.

Unlike the separate estimations of blind scores and non-blind scores, the direct estimations of ΔS (or joint estimations of two scores by subtractions) now show that even an inclusion of φ^M does not sufficiently capture the male effect estimated to be negative. The two-score differences are assumed to more directly capture the effect brought by the score markers (teachers) who know who the evaluated are. In contrast to the results from the benchmark analyses, the results in Table 9 reinforce our hypothesis that male (female)

students are more likely to be treated relatively unfavorably (favorably) when students are rated in a non-blind rating system in which teachers know who the evaluated are.

C. *What More Do We Need to Consider?*

So far, the benchmark analyses and direct estimations of two-score differences imply supportive results of our hypothesis. This subsection explores and examines the obtained results from some critical perspectives, to ascertain the arguments. Let us specifically discuss the selection bias, the students' studiousness, and the teachers' genders as alternative factors.

Table 10: Probit Analysis (Probability of the tracking scores on NATs)

Independent Variables	Coef.
Male (=1)	1.21
	[1.54]
Grade	-0.08
	[0.07]
Male×Grade	-0.08
	[0.10]
z score on RC, Filipino	-0.07
	[0.20]
Male×z score on RC, Filipino	0.01
	[0.29]
z score on RC, math	-0.14
	[0.18]
Male×z score on RC, math	-0.3
	[0.29]
z score on RC, Englsih	-0.48**
	[0.24]
Male×z score on RC, English	0.89***
	[0.34]
z score on RC, science	0.43*
	[0.23]
Male×z score on RC, science	-0.14
	[0.35]
z score on RC, social studies	0.2
	[0.21]
Male×z score on RC, social studies	0.06
	[0.30]
Intercept	1.5
	[1.12]
Regional effect	Yes
Pseudo R^2	0.17
No. of Obs.	202

Note: Numbers in brackets are robust standard errors.
Source: Author's own calculation.

1. *Would the tracking of scores on NATs matter?*

In directly estimating the two-score differences, the subsample whose ΔS are observed is used. This subsample is the one whose scores on NATs were tracked. As in Section III, the scores on NATs were tracked by the BEA-DepED at their best efforts in correspondence with the author's data request. Admittedly, when tracking students, the BEA-DepED had neither any intention nor incentive to omit and exclude specific students. In this sense, the success or failure of tracking the students is out of our control and choice. Nevertheless, the *ex post* outcome implies that the gender gaps ($\Delta \mathrm{F} - \mathrm{M}$) get smaller in the Table 8 than those in Table 2. Possible reasons may include the following: (1) the non-tracked students recently migrated to our study areas in Marinduque Province as the tracking was done based on the individual names and current home address, or (2) some students did not take the NATs.

For (1), it is least possible according to our field observations. Our sampling framework was based on the master list information on the CBMS conducted in 2015, and our own household survey was conducted in 2018. We found only four households that were not listed in the CBMS out of all the sample households. Moreover, out of those four households, only one household's children's NAT scores were not tracked by the BEA-DepED. The migration profile is thus thought to be least associated with the tracking rates.

In turn, the possibility of (2) can be more considerable than (1). In principle, it is an obligation for every eligible student to take the NAT regardless if he/she is enrolled in a public or private school. In practice, however, some local teachers reported to the author that some students might not take the NAT because they were absent on the date of the examination. Teachers let the students take the NAT, but there is no explicit penalty even if a student did not take it.

Therefore, by probit analysis, the probability of the NAT scores being tracked is estimated. The male indicator is an independent variable. In addition, the score information on RC of the same school subject (Filipino, math, English, science, and social studies) is also used as independent variables to consider the possibility of associations with lower academic performances. Additionally, the interaction terms of male indicator with each score information on RC are also used in the independent variables.

Table 10 shows the results. They do not support that neither sex influences the probability of NAT scores being tracked, yet there is a gender-heterogenetic association in English performance. The scores on NATs of those male students better performing English are more likely to be tracked than the female students who perform similarly. For science performance, there is a gender-homogeneous association, as the scores on NATs of those

students performing better in science are more likely to be tracked regardless of gender.

In any case, given the estimated results, the probability of the NAT scores being tracked or untracked, even if it is a bias, would not do harm to the interpretations of the results in Table 9 because the probability only works for the negative male effects to be more weakly detected than in the counterfactual situation where NAT scores of all the students were tracked. If the potentiality had the opponent property, namely, if the scores on NATs of those better-performing students were less likely to be tracked, our results could be overestimated. However, our logical inference and the probit analysis do not support the opponent case, and so we can interpret the current results as existing at the very least. Counterfactually, the male effects in our results could have been more significant. Eventually, these reconfirm that the negative male effects in the counterfactual situation could have been statistically significant no less than our current results in Table 9 but that they could not have been weaker than our current results in the same table.

2. *Would the studiousness of students matter?*

Aside from the potentiality of NAT score-related selection bias, there is another issue to be considered. Some may criticize that the NATs are the object-test-based examinations and the numbers of correct answers really matter, but in contrast, the scores on RC are calculated more holistically depending not only on the objective performance but also on the attitudinal factors of student learning. The author has two arguments against this possible criticism.

First, students' attitude- and mentality-based "observed values," such as *maka-diyos* (piety), *makatao* (humane personality), *maka-kalikasan* (friendliness to the environment and nature), and *makabansa* (nationalism and citizenship), are also evaluated on the RC separately from the subject learning performances. Even if attitudinal factors matter, the teachers are assumed to distinguishably rate the scores because academic performances and such value-based attitudinal proactivity bases are evaluated separately.

Second, on the contrary, in their rating policy circulated to all the school teachers, the DepED certainly asks the teachers to rely not only on objective basis but also on others. DepED (2015) figures out three criteria to rate the scores on RC: (1) performance tasks, (2) written works, and (3) quarterly assessment. The quarterly assessment is to evaluate the achievement in the semester exams. The (1) and (2) would add routine attitudinal factors in student learning; attendance and the extent of accomplishing projects (a kind of homework) matter. Some would say that there can be a gender difference in the routine-based factors between male and female students before talking about the teacher-perceived stereotypes.

In case a student's attitudinal factors cannot be captured by his/her RC parts in

maka-diyos, *makatao*, *maka-kalikasan*, and *makabansa*, the current study also tries an alternative way to control for such attitudinal factors as much as possible. Thus, our data collected the information of the weekly time-allocation patterns of children. As explained in Subsection B in Section III, we have information on children's time allocation regarding time at home and time spent working plus the weekly frequency of going to schools. The pattern differences are additionally controlled just as additional covariates of proxies of their real attitudinal factors.

Table 11 shows the estimation of ΔS additionally with the information of time-allocation patterns as covariates to specification (5) in Table 9. Even when such time-allocation patterns are controlled for, the male effect on ΔS remains negative. These results reconfirm that the male students are still more likely to be treated unfavorably in the non-blind scores even when time-allocation patterns as proxies of students' studiousness are additionally controlled for.

Table 11: Sensitivity Analysis of Differences between Scores on RC and on NAT by Subjects
(Covariates = Specification (5) in the Table 9 + Time-allocation Patterns)

	Filipino	Math	English	Science	Soc. Stu.
Male (=1)	-1.28	-3.27***	-1.84**	-1.82**	-1.86**
	[0.90]	[0.89]	[0.85]	[0.71]	[0.76]
Adj. R^2	0.24	0.27	0.26	0.28	0.26
No. of Obs.	117	115	117	113	106

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

Notes: 1. Soc. Stu. = Social Studies. Numbers in brackets are robust standard errors.
2. Coefficients of other covariates are omitted in this report for space and visual purposes.
3. Information on the time-allocation patterns is added as covariates to the specification (5) in Table 9.

Source: Authors' own calculation.

3. *Teachers' Gender Matters?*

When considering the teachers as a source of stereotyping, teachers' attributes would matter. The teachers' gender is a potentially key variable (Torres, 2011). Indeed, the labor market of school teachers in the Philippines is highly predominated by female teachers, said to count for 80% or 90%. Actually, the teacher gender ratios (TGRs) of the sample schools present the high predominance of female teachers regardless of school subject and education level.

Table 12 summarizes the TGRs of the sampled schools. Overall, 81.7% of school

teachers are females. At the elementary and secondary levels, 87.1% and 72.0% of teachers are females, respectively. This shows that majority of the school teachers are females, which is a feature quite unique to the Philippines. By school subjects, more female teachers teach the five NAT-covered subjects (Filipino, math, English, science, and social studies) than the two non-NAT subjects (MAPEH and TLE; 79.3% vs 57.4%). Compatibility between own-sex teachers and cross-sex teachers for a student can be a source of supply-side-originated stereotypes or bias. Therefore, in addition to the studiousness of students, the TGRs of the said school subject in the student's school shall be used in the analyses as additional set of controlling variables.

Table 12: Teachers' Gender Ratios by School Levels and Subjects (Sample Schools)

School Levels and Subjects	TGR	
Overall	Male teachers	18.3%
	Female teachers	81.7%
Elementary Level	Male teachers	12.9%
	Female teachers	87.1%
Secondary Level	Male teachers	28.0%
	Female teachers	72.0%
General 5 Subjects (Filipino, Math, English, Science, Social Studies)	Male teachers	20.7%
	Female teachers	79.3%
MAPEH + TLE	Male teachers	42.6%
	Female teachers	57.4%

Source: DepED Basic Education Information System (BEIS).

Table 13 reports the estimation results with the TGRs of each school subject in the enrolled school as additional set of controlling variables to the covariates in specification (5) of Table 9. Comparing with Table 11, after the TGRs are controlled, the negative signs turn to be insignificant in Table 13, except for math. Combining the results of Table 9, Table 11, and Table 13, we can interpret as follows: The male effect is estimated to be negative in Table 9, and Table 11 implies that the additional controlling variables such as the time-allocation patterns as proxies of students' studiousness did not yet sufficiently represent the marginally lower scores on the two-score differences. However, the male effect which turns to be insignificant in Table 13 indicates that the teachers' attribute such as their gender variations now considerably represents the marginally lower scores on the two-score differences.

If the male students were lazy, irresponsible in learning, and underperforming as

compared to their female counterparts determinately, inclusion of a teachers' attribute, such as gender, would not matter in the sensitivity of the male effect on the two-score difference. Nonetheless, Table 13 presents that the persistent male effect vanishes when the own-subject teachers' gender variations are controlled, and thus, the negative male effect on the two-score differences is interpreted to be highly represented by such a teacher-side attribute. Incorporating the empirical framework focusing on the difference between blind and non-blind rating systems, it is thought to be most likely reasonable to interpret that the "boys' underperformance" is augmented by the score markers, namely, teachers, through a mode of stereotyping or bias against male students.

Table 13: Sensitivity Analysis, Difference Between Scores on RC and on NAT by Subject
(Covariates = Specification (5) in Table 12 + TGRs of each school subject)

	Filipino	Math	English	Science	Soc. Stu.
Male (=1)	2.02	1.29	0.20	0.88	1.27
	[1.69]	[1.19]	[1.36]	[1.01]	[1.18]
Adj. R^2	0.20	0.28	0.20	0.37	0.30
No. of Obs.	115	113	115	111	104

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

Notes: 1. Soc. Stu. = social studies. Numbers in brackets are robust standard errors.
2. Coefficients of other covariates are omitted in this report for spaces and visual purposes. Appendix Table 3 provides the full reports.

Source: Authors' own calculation.

Furthermore, Table 14 supports the results from Table 13. Table 14 presents the results of estimating the model including interaction term of male indicator with the TGRs of each own school subject ($M_i * TGR_{s,i}$ for the own subject s), or in a math expression:

$$\Delta S_{is} = \delta_s'' M_i + \delta_{TGR}\left(M_i * TGR_{s,i}\right) + \mathbf{X}\boldsymbol{\beta}_\mathbf{s}'' + \rho + \omega + \varphi^{all} + \varphi^{M} + u_{is}''. \quad (5)$$

The coefficients of male indicator shift to be statistically positive for math, science, and social studies (for Filipino and English, point estimates are positive but not statistically significant). The coefficients of interaction term for the same set of subjects are estimated to be negative. Yet, the overall effect of female TGRs is insignificant over all the subjects. These mean that being male would potentially predict positive effect on ΔS, but actually, as the female TGRs increase, male students selectively receive lower non-blind scores. However, even when the

female TGRs increase, it does not influence the female students.

Table 14: Sensitivity Analysis, Difference between Scores on RC and on NAT by subject (Covariates = Specification (5) in Table 11 + Interaction term of male indicator with the TGRs of each own school subject)

	Filipino	Math	English	Science	Soc. Stu.
Male (=1)	13.04	68.25***	5.66	44.59**	207.28**
	[22.41]	[20.92]	[17.65]	[17.53]	[82.82]
Female TGR (own subject)	-0.10	-7.85	-10.13	-24.06	-88.34
	[15.18]	[19.81]	[14.16]	[20.72]	[113.39]
Male × Female TGR (own subject)	-12.68	-94.32***	-5.94	-53.31**	-239.54**
	[24.27]	[28.69]	[20.23]	[20.73]	[95.54]
Adj. R^2	0.20	0.28	0.20	0.37	0.30
No. of Obs.	115	113	115	111	104

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

Notes: 1. Soc. Stu. = social studies. Numbers in brackets are robust standard errors.

2. Coefficients of other covariates are omitted in this report for space and visual purposes. Appendix Table 3 provides the full reports.

Source: Authors' own calculation.

VI. CONCLUION

Section V provides various findings from sensitivity analysis to support the hypothesis that students of one gender are stereotyped when school teachers know who the evaluated are or when students are rated in a non-blind rating system. School teachers may, even unconsciously, believe some unfavorable stereotypes toward one of the genders (Torres, 2011). Our identification strategy is similar to that of Lavy (2008). Our results of the benchmark analyses and the direct (joint) estimations of two-score differences among the same students support the statement that male students are more likely to systematically get evaluated lower than their female counterparts when teachers know who the evaluated are. Some further investigations regarding robustness by sensitivity analysis (Oster, 2017) also serve to confirm whether the results remain the same qualitatively as what was obtained previously. Particularly, the sensitivity explorations support our hypothesis because the persistently negative male effect vanishes when variations of teachers' attributes are controlled for. The conclusions include the notion that the existing and persistent Filipino boys' "underperformance in education" is augmented or amplified by evaluators who know

who the evaluated are.

More than a dozen explorations of sensitivities of male effect with respect to added controls done in this study quantitatively pin down the possible source(s) of persistent negative male effect. For example, according to the increasing adjusted R^2, as more controls are added, some individual- and household-level characteristics are already significant predictors of academic achievement and disparities. What we need to recall, however, is the persistence of male effect staying negative even when they are added. The persistence has lasted until male-specific school effect and, more explicitly, the female TGR information are controlled. Considerable parts of the persistent negative male effect on the difference capturing the blind vs. non-blind rating system are therefore represented not by individual-, household-, or region-level variations but by school-side variations, particularly of teachers. Yet, it should be noted here that this paper does not intend to blame teachers who would stereotype in the end. It requires a more nuanced attitude to consider the background if such stereotype can even potentially, unconsciously, and unintentionally be exercised.

The findings are also relevant to the controversy in the literature on the HL effect. Whereas the previous literature tends to deny the HL effect, the current study obtains the results to reappraise the HL effect captured by school teachers that work heterogeneously over genders. This is consistent with the latest studies (Hanushek and Woesmann, 2017) that attach an exceptional status to teachers out of other school-resource variables in explaining disparities of academic performances among students. Needless to say, children and their parents face barriers and obstacles contingent with their SES——demand-side factors. Situations of extreme poverty and instability, for instance, would require children to spend their time contributing to their households' livelihood rather than stay in school. It has been widely documented that parents facing financial constraints stop sending their son(s) to school more frequently compared to their daughters because parents know that sons tend to receive lower evaluations from schools.

A social significance of being stereotyped was spelled out in the literature. For example, the risk of being stereotyped was warned by sociology and sociopsychology as "stereotype threat" (Steele and Aronson, 1995), with a study of relations between African Americans and their test performances. If the stereotype threat holds, the stereotype and the set of stereotyped behaviors will be in a recursive, recurrent relation: People are stereotyped by others because of their certain behaviors, and, in turn, people will behave in that way because of that very stereotype.

The "boys' underperformance in education" is a puzzle in the setting of developing countries because poorer countries are generally more challenged by the issue of provision of girls' education. Previous literature working on the Philippine case provided us with some

empirically sound perspectives to explain the backgrounds of the issue, including focuses on poverty as a driving force of boys' immediate contributions to family livelihoods as labor forces rather than as student learning in schools, especially upon reaching physical maturity (Torres, 2011); on the comparative advantage between men and women with respect to agricultural occupations that are less profitable than jobs in non-agricultural sectors (Estudillo et al. 2008); on some parental egalitarian behaviors with respect to either inheriting lands to sons as a bequest or investing as its compensation in daughters' human capital (Estudillo et al. 2001); willingness or "pro-girl" intra-household bias of parents in rural Philippines in treating their daughters more favorably than their sons (Fuwa, 2014); on pressure for female to more achieve human capital accumulation in a reflection of the pressures and wage penalties in Philippine labor markets toward women (Yamauchi and Tiongco, 2013); or on the boys' laziness and irresponsibility to learning as if they are their inherent habitudes (Bouis et al. 1998), among others. These perspectives basically suggest demand-side interventions to achieve the more gender-equal educational achievement. However, this study, through a channel of school-side factors, suggests supply-side interventions regarding the same issue. For instance, the high female dominance of teacher labor markets in the Philippines is of interest. If the "chemistry" of female teachers with male students is one of the stated sources, informing female (and also male) teachers of the possible bias in evaluating male and female students can be one option we can begin with in addition to enriching demand-side focus on interventions.

Yet, the current study still does have some limitations to be addressed in the future. Firstly, the tracking rates of scores on NATs should have been higher. Indeed, it is generally strictly restricted for the government to provide individual-based score information. Additionally, in most cases, it must be an especially difficult task to match every individual between our own prepared list and the information in the government's storage. Yet, tighter collaborations of academic researchers and the government before designing and planning researches could enable a broader coverage of matching information. Secondly, it is more desirable for more detailed information on teachers' backgrounds to be collected so that the robustness of the obtained results can be further proven. Finally, explorations of additional possible factors on students to the routine-work-based evaluations on RC are a future challenge to be incorporated.

REFERENCE

Altonji, Joseph G.; Todd E. Elder; and Christopher R. Taber. 2005. "An Evaluation of Instrumental Variable Strategies for Estimating the Effects of Catholic Schooling."

Journal of Human Resources 40: 791–821.

Asadullah, Mohammad Niaz, and Nazmul Chaudhury. 2009. "Reverse Gender Gap in Schooling in Bangladesh: Insights from Urban and Rural Households." *Journal of Development Studies* 45, no. 8: 1360–1380.

Baker, David P.; Brian Goesling; and Gerald K. LeTendre. 2002. "Socioeconomic Status, School Quality, and National Economic Development: A Cross-National Analysis of the 'Heyneman–Loxley Effect' on Mathematics and Science Achievement." *Comparative Education Review* 46, no. 3: 291–312.

Bellows, John, and Edward Miguel. 2009. "War and Local Collective Action in Sierra Leone." *Journal of Public Economics* 93: 1144–157.

Björn, T.H., Höglin, E. and M. Johannesson. 2011. "Are Boys Discriminated in Swedish High Schools?" *Economics of Education Review* 30, no. 4: 682–690.

Bouhlila, Donia Smaali. 2015. "The Heyneman–Loxley Effect Revisited in the Middle East and North Africa: Analysis using TIMSS 2007 Database." *International Journal of Educational Development* 42: 85–95.

Bouis, Howarth. E.; Marilou Palabrica-Costello; Orville Solon; Daniel Westbrook; and Azucena B. Limbo. 1998. *Gender equality and investments in adolescents in the rural Philippines*. Research Report 108. International Food Policy Research Institute, Washington, DC.

Carlana, Michela. 2017. "Stereotypes and Self-Stereotypes: Evidence from Teachers' Gender Bias." *mimeo,* http://www.aiel.it/cms/cms-files/submission/all20170822084159.pdf (Retrieved on September 25, 2018).

Coleman, J.S.; Campbell, E.Q.; Hobson, C.J.; McPartland, J.; Mood, A.M.; Weinfeld, A.D.; and York, R.L. 1966. *Equality of Educational Opportunity*. Washington, DC: US Government Printing Office.

Cornwell, Christopher; David B. Mustard; and Jessica Van Parys. 2013. "Noncognitive Skills and the Gender Disparities in Test Scores and Teacher Assessments: Evidence from Primary School." *Journal of Human Resources* 48, no. 1: 236–264.

Dusek, Jerome B., and Gail Joseph. 1983. "The Bases of Teacher Expectancies: A meta-analysis." *Journal of Educational Psychology* 75, no. 3: 327–346.

Estudillo, Jonna P.; Agnes R. Quisumbing; and Keijiro Otsuka. 2001. "Gender Differences in Land Inheritance and Schooling Investment in the Rural Philippines." *Land Economics* 77, no. 1: 130–143.

Estudillo, Jonna P.; Yasuyuki Sawada; and Keijiro Otsuka. 2008. "Poverty and Income Dynamics in Philippine Villages, 1985–2004." *Review of Development Economics* 12, no. 4: 877–890.

Fuwa, Nobuhiko. 2014. "Pro-Girl Bias in Intra-Household Allocation in the Rural Philippines." *Review of Development Economics* 18, no. 4: 727–740.

Gaddi, Rebecca S. 2018. "Integrating the *Saemaul Undong* Spirit: Stimulating Capacity for Rural Development." *Philippine Journal of Labor and Industrial Relations* 35: 39–71.

Hanushek, Eric A. 2006. "School Resources." In *Handbook of the Economics of Education*, Vol. 2, edited by Eric A. Hanushek and Finis Welch. Amsterdam: North Holland.

Hanushek, Eric A., and Ludger Woessmann. 2017. "School Resources and Student Achievement: A Review of Cross-Country Economic Research." In *Cognitive Abilities and Educational Outcomes: A Festschrift in Honour of Jan-Eric Gustafsson*, edited by Monica Rosén, Kajsa Yang Hansen, and Ulrika Wolff. Cham: Springer International Publishing.

Heyneman, Stephen P. 1989. "Multilevel Methods for Analyzing School Effects in Developing Countries." *Comparative Education Review* 33, no. 4: 498–504.

Heyneman, Stephen P., and William A. Loxley. 1983. "The Effect of Primary-School Quality on Academic Achievement across Twenty-Nine High- and Low-Income Countries." *American Journal of Sociology* 88, no. .6: 1162–194.

Huang, Francis L. 2010. "The Role of Socioeconomic Status and School Quality in the Philippines: Revisiting the Heyneman-Loxley Effect." *International Journal of Educational Development* 30, no.3: 288–296.

Jha, Jyotsna; Shubhashansha Bakshi; and Ernesto Martins Faria. 2012. "Understanding and Challenging Boys' Disadvantage in Secondary Education in Developing Countries." Background paper prepared for the *Education for All Global Monitoring Report 2012*. Paris: UNESCO.

Khandker, Shahidur; Mark Pitt; and Nobuhiko Fuwa. 2003. "Subsidy to Promote Girls' Secondary Education: The Female Stipend Program in Bangladesh." MPRA Paper 23688, Munich: University Library of Munich.

Kitamura, Yuto. 2015. *The Scope of International Educational Development Studies*. (in Japanese) Tokyo: Toshindo Press.

Lam, Chun Bun, and Susan M. McHale. 2015. "Time Use as Cause and Consequence of Youth Development." *Child Development Perspectives* 9, no. 1: 20–25.

Lavy, Victor. 2008. "Do Gender Stereotypes Reduce Girls' or Boys' Human Capital Outcomes? Evidence from a Natural Experiment." *Journal of Public Economics* 92: 2083–105.

Lavy, Victor, and Edith Sand. 2018. "On the Origins of the Gender Gaps on Human Capital: Short- and Long-Term Consequences of Teachers' Biases." *Journal of Public Economics* 167: 263–279.

Miralao, Virginia A. 2008. "Towards Post-Feminism in Philippine Education." In *The Paradox of Philippine Education and Education Reform: Social Scientific Perspectives*, edited by Allan Bernado. Quezon City: Philippine Social Science Council.

OECD. 2014. *Are Boys and Girls Equally Prepared For Life*? Paris: OECD (Retrieved http://www.oecd.org/pisa/pisaproducts/PIF-2014-gender-international-version.pdf).

Okabe, Masayoshi. 2018. "'Under-Performing' or Resilient Filipino Boys in Education? Listening to Students' and Adults' Perspectives and Backgrounds: A Western Visayas Case." *IDE Discussion Paper Series* 705.

Oster, Emily. 2017. "Unobservable Selection and Coefficient Stability: Theory and Evidence." *Journal of Business and Economic Statistics*, 1–18, DOI: 10.1080/07350015.2016.1227711

Philippine Statistics Authority (PSA). 2015. *Labor Force Survey 2015*.

Riddell, Abby Rubin. 1989a. "An Alternative Approach to the Study of School Effectiveness in Third World Countries." *Comparative Education Review* 33, no.4: 481–497.

————. 1989b. "Response to Heyneman." *Comparative Education Review* 33, 505–506.

————. 1997. "Assessing Designs for School Effectiveness Research and School Improvement in Developing Countries." *Comparative Education Review* 41, no. 2: 178–204.

Riegle-Crumb, Catherine, and Melissa Humphries. 2012. "Exploring Bias in Math Teachers' Perceptions of Students' Ability by Gender and Race/Ethnicity." *Gender and Society* 26, no. 2: 290–322.

Steele, Claude, and Joshua Aronson. 1995. "Stereotype Threat and the Intellectual Test Performance of African Americans." *Journal of Personality and Social Psychology* 69: no. 5: 797–811.

Terrier, Camille. 2014. "Giving a Little Help to Girls? Evidence on Grade Discrimination and its Effect on Students' Achievement." CEP Discussion Papers, no. 1341.

Tiedemann, Joachim. 2000. "Parents' Gender Stereotypes and Teachers' Beliefs as Predictors of Children's Concept of their Mathematical Ability in Elementary School." *Journal of Educational Psychology* 92, no. 1: 144–151.

————. 2002. "Teachers' Gender Stereotypes as Determinants of Teacher Perceptions in Elementary School Mathematics." *Educational Studies in Mathematics* 50, no. 1: 49–62.

Torres, Amaryllis. 2011. "Analysis on Why Boys Do Poorly: Philippines Case Study." *mimeo*, UNGEI.

UNGEI. 2012. *Why are Boys Under-performing in Education? Gender Analysis of Four Asia-Pacific Countries*. United Nations.

White, Karl R. 1982. "The Relation between Socioeconomic Status and Academic Achievement." *Psychological Bulletin* 91, no. 3: 461–81.

Zimmermann, Thomas, and James H. Williams. 2016. "Parents' Educational Expectations, Their Determinants, and Consequences in Explaining Students' Dropout in an Area in Cambodia." In *The Political Economy of Schooling in Cambodia: Issues of Quality and Equity*, edited by Yuto Kitamura, D. Brent EdwardsJr., Chhinh Sitha, and James H. Williams. Hampshire: Palgrave MacMillan.

- Administrative Document

DepED Order No. 8. s. 2015. *Policy Guidelines on Classroom Assessment for the K to 12 Basic Education Program*. Department of Education.

- Database

Functional Literacy, Education and Mass Media Survey (FLEMMS) 2013. Quezon City: Philippine Statistics Authority (PSA).

Labor Force Survey (LFS) 2015. Quezon City: Philippine Statistics Authority (PSA).

APPENDIX I

This Appendix I provides the sample characteristics based on the summary statistics of the dependent and independent variables, based on our full model. Appendix Table 1 provides the summary statistics of the dependent and independent variables.

A. *Individual Characteristics*

The male indicator variable shows that 48% of children in our sample are males (the remaining 52% are females). The birth-order information uses the indicators of being firstborn (*panganay*) and being last-born (*bunso*) children, and the numbers of younger siblings and of older siblings show that 17% and 22% of children are firstborn and last-born, respectively. Firstborn sons and last-born sons account for 7% and 10%, respectively. On average, a child has 1.76 younger siblings and 2.64 elder siblings, which imply that the average total number of siblings is around 5.4 (=1.76 (younger siblings) + 2.64 (elder siblings) + 1.0 (oneself)). Among the siblings, the birth order of a child on average is thus around second to third. Out of the sample size, 48% of children have some sort of role model in their community whom he or she admires and wants to be like in the future. The information on the time-allocation patterns is standardized into z scores for comparability.

Appendix Table 1: Summary Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Independent variables:					
Individual characterstics					
Male indicator	310	0.48	0.50	0.00	1.00
Eldest	313	0.17	0.38	0.00	1.00
Eldest × Male	310	0.07	0.26	0.00	1.00
Youngest	313	0.22	0.41	0.00	1.00
Youngest × Male	310	0.10	0.30	0.00	1.00
No. of younger siblings	310	1.76	1.42	0.00	7.00
No. of elder siblings	310	2.64	2.32	0.00	11.00
Having role-modelled person	310	0.48	0.50	0.00	1.00
Time-allocation patterns (in z scores)					
Studying at home	303	0.00	1.00	-1.06	5.20
Playing	303	0.00	1.00	-0.76	7.07
Weekly frequency of going to school	303	0.00	1.00	-2.67	1.67
Helping for father's job	303	0.00	1.00	-0.43	6.75
Helping for mother's job	303	0.00	1.00	-0.43	5.35
Helping for household chores	303	0.00	1.00	-1.23	4.04
Computer-game shop usage	303	0.00	1.00	-0.42	9.34
Household characteristics					
Father's education	294	8.92	3.18	1.00	14.00
Mother's education	308	9.01	3.17	2.00	14.00
log per capita income	310	6.90	1.16	0.00	9.72
Father's age	310	46.97	7.72	31.00	74.00
Mother's age	292	40.91	6.81	31.00	73.00
Having mobile phone	310	0.61	0.49	0.00	1.00
Income share by mother's earning	308	0.20	0.28	0.00	1.00
Income share by remmittance	308	0.13	0.24	0.00	0.89
CCT beneficiary indicator	310	0.38	0.49	0.00	1.00
Female-headed indicator	310	0.09	0.29	0.00	1.00
Father not living together indicator	313	0.12	0.33	0.00	1.00
Mother not living together indicator	313	0.09	0.28	0.00	1.00
Father is land owning farmer	313	0.05	0.22	0.00	1.00
Father is contruct farmer	313	0.04	0.21	0.00	1.00
Father is agricultural wage laborer	313	0.08	0.28	0.00	1.00
Father is fisherman	313	0.14	0.35	0.00	1.00
Father is proprietor	313	0.01	0.11	0.00	1.00
Working mother indicator (=1)	292	0.49	0.50	0.00	1.00
Mother is land owning farmer	313	0.01	0.08	0.00	1.00
Mother is proprietor	313	0.00	0.00	0.00	0.00
School variables:					
Public school indicator (=1)	282	0.92	0.27	0.00	1.00
Filipino: Female teacher gender ratio	275	0.81	0.16	0.50	1.00
Math: Female teacher gender ratio	275	0.68	0.16	0.00	1.00
English: Female teacher gender ratio	275	0.91	0.11	0.50	1.00
Science: Female teacher gender ratio	275	0.88	0.12	0.00	1.00
Social Studies: Female teacher gender ratio	275	0.84	0.08	0.50	1.00
MAPEH: Female teacher gender ratio	275	0.65	0.19	0.00	1.00
TLE: Female teacher gender ratio	275	0.72	0.23	0.00	1.00

Source: Author's own calculations.

B. *Household Characteristics*

On average, parents completed the third grade out of the four-year secondary education and thus did not complete their secondary education in full.[17] Mothers generally completed more years of education than fathers did. On average, fathers are older than mothers (their wives). Out of all households, 61% have at least one mobile phone, i.e., 39% do not have any mobile phones. Contributions of mothers' earnings account for 20% of their household incomes on average, with remittances from other family members living separately contributing to 13%. The beneficiary households of conditional cash transfer account for 38%, implying that these households are poorer than otherwise. The coresidential status shows that 9% of households are female-headed due to the death of husbands (fathers) or to separation,[18] and fathers and mothers live separately in 12% and 9% of households due to working in another place or in a foreign country, respectively.

The parental job category indicators are used, letting non-primary-sector and proprietorial jobs be reference categories. Out of the fathers, 5%, 4%, and 8% are land-owner farmers, tenant farmers, and agricultural wage laborers, respectively, whereas 14% are fishermen and 1% are in proprietorial positions such as management. Out of the mothers, 49% work, with most being self-employed or in the service sector. Only 1% worked in agriculture and none were in proprietorial positions.

C. *School Variables*

School variables include the public school indicator (1 if the school is public) and female TGRs for each school subject. In the sample, 92% of the schools children enrolled in are public schools. According to the subject-level TGRs, the majority of teachers, ranging from 65% (MAPEH) to 91% (English), are female.

D. *Time-allocation Patterns between Male and Female Children*

Appendix Table 2 further decomposes the mean values of *z* scores of time-allocation patterns by male and female. There are clearly gender differences between male and female children. Female children are more likely to spend more time studying at home and at school as well as helping with household chores compared to their male counterparts. In contrast, male children are more likely to spend more time playing, helping with their fathers' work, and using computer game shops. Interestingly, given that more male youths are expected to

[17] In the parents' generation, the secondary education was for only 4 years.

[18] In the Philippines, legal divorce is not common due to the country's adherence to Catholic rules. People report their marital status as "separated" if it is substantially similar to the situation of divorced couples.

contribute to their household livelihood in accordance with social norms, there is no gender difference on the time allocated for helping with their mothers' work.

Appendix Table 2: Mean Comparisons, Time-allocation Patterns

Time-use variables (in z scores)	Female	Male
Studying at home	0.25	-0.29
Weekly frequency of going to school	0.23	-0.26
Playing	-0.39	0.44
Helping for father's job	-0.25	0.28
Helping for mother's job	0.00	0.01
Helping for household chores	0.21	-0.24
Computer-game shop usage	-0.13	0.15

Source: Author's own calculations.

APPENDIX II

Appendix II provides supplementary information about the full reports of the estimations of the scores on the difference between NAT and RC scores. Appendix Table 3 presents the full report of results for full-model estimations in which the region effect, school effect, male-specific part of school effect, time-allocation patterns, own-subject female TGRs and their interaction term with the male indicator, as well as individual and household characteristics are controlled for (corresponding to the results reported in Table 13 and Table 14). Let us overview the associations of other individual and household characteristics and time-allocation patterns aside from male indicators.

A. *Individual and Household Characteristics*

There are some variables capturing statistically significant individual and household characteristics, as follows. The birth-order variations do not seem to be effective except for being the eldest son, but children with more siblings, especially more older siblings, are more likely to score better on RC than on NAT; children who have role models within the community are more likely to score better on RC than on NAT; students who go to school more times per week are more likely to score better RC than on NAT; higher logarithmic per capita incomes predict better scores on RC than on NAT; higher income shares by remittances predict negative scores on RC compared to those on NATs (this can be

related to the instability of their livelihoods because their household livelihoods rely more on remittances, not on their breadwinners' earnings); an indicator of conditional cash transfer beneficiary predicts slightly better scores on RC than on NAT; households with fathers or mothers living separately predict slightly better scores on RC than on NAT compared to households with cohabitating fathers or mothers; children whose fathers are land-owning farmers or in proprietorial positions are more likely to score better on RC than on NAT compared to their counterparts with fathers who are self-employed or in manufacturing occupations.

These relations show that, before mentioning teacher-perceived stereotypes, the above characteristics would partially predict the factors of better engagement with routine-based school activities that can affect teachers' evaluations on the RC scores.

B. *School Variables*

Aside from school fixed effects, the following school variables are used as covariates: the public-school indicator (1 if the school is public), the mode of transportation to schools (1 if walking and 0 otherwise), school-distance information (kilometers and minutes from each house), female TGRs of own subjects, and their interaction terms with male indicator. Firstly, children enrolled in public schools are more likely to score lower compared to NAT than children enrolled in private schools. The results regarding the TGRs were interpreted in Subsection C of Section V.

Appendix Table 3: Full Report of Estimations

Independent variables	Δz (z_{NAT} - z_{RC}) without Male*TGR interactions					Δz (z_{NAT} - z_{RC}) with Male*TGR interactions				
	Filipino	Math	English	Science	AP	Filipino	Math	English	Science	AP
Individual characteristics:										
Male indicator (=1)	2.02	1.29	0.20	0.88	1.27	13.04	68.25***	5.66	44.59**	207.28**
	[1.69]	[1.19]	[1.36]	[1.01]	[1.18]	[22.41]	[20.92]	[17.65]	[17.53]	[82.82]
Eldest indicator	0.26	0.44	-0.15	0.25	0.04	0.26	0.44	-0.15	0.25	0.04
	[0.62]	[0.61]	[0.55]	[0.39]	[0.58]	[0.62]	[0.61]	[0.55]	[0.39]	[0.58]
Eldest son indicator	-1.50	-1.94**	-0.13	-1.80**	-0.09	-1.50	-1.94**	-0.13	-1.80**	-0.09
	[1.03]	[0.92]	[0.85]	[0.82]	[0.95]	[1.03]	[0.92]	[0.85]	[0.82]	[0.95]
Youngest indicator	-0.27	-0.72	-0.44	0.13	0.36	-0.27	-0.72	-0.44	0.13	0.36
	[0.60]	[0.50]	[0.56]	[0.41]	[0.49]	[0.60]	[0.50]	[0.56]	[0.41]	[0.49]
Youngest son indicator	0.84	0.79	0.86	0.77	0.29	0.84	0.79	0.86	0.77	0.29
	[0.83]	[1.00]	[0.88]	[0.78]	[0.94]	[0.83]	[1.00]	[0.88]	[0.78]	[0.94]
No. of elder siblings	0.22**	0.22**	0.21**	0.22**	0.22**	0.22**	0.22**	0.21**	0.22**	0.22**
	[0.09]	[0.10]	[0.09]	[0.09]	[0.09]	[0.09]	[0.10]	[0.09]	[0.09]	[0.09]
Male * No. of elder siblings	-0.21	-0.37**	-0.16	-0.32**	-0.14	-0.21	-0.37**	-0.16	-0.32**	-0.14
	[0.14]	[0.17]	[0.15]	[0.13]	[0.16]	[0.14]	[0.17]	[0.15]	[0.13]	[0.16]
No. of younger siblings	0.21	0.16	0.19	0.28**	0.38**	0.21	0.16	0.19	0.28**	0.38**
	[0.19]	[0.16]	[0.14]	[0.12]	[0.15]	[0.19]	[0.16]	[0.14]	[0.12]	[0.15]
Male * No. of younger siblings	0.08	0.09	-0.24	0.01	-0.38	0.08	0.09	-0.24	0.01	-0.38
	[0.34]	[0.37]	[0.30]	[0.28]	[0.27]	[0.34]	[0.37]	[0.30]	[0.28]	[0.27]
Role-model indicator	0.55	0.43	0.74*	0.90***	0.34	0.55	0.43	0.74*	0.90***	0.34
	[0.33]	[0.32]	[0.39]	[0.25]	[0.36]	[0.33]	[0.32]	[0.39]	[0.25]	[0.36]
Z scores, Time-allocation patterns:										
Studying at home	-0.28*	-0.16	-0.18	-0.24*	-0.03	-0.28*	-0.16	-0.18	-0.24*	-0.03
	[0.17]	[0.19]	[0.18]	[0.14]	[0.15]	[0.17]	[0.19]	[0.18]	[0.14]	[0.15]
Playing	-0.64**	-0.1	-0.12	-0.02	-0.50**	-0.64**	-0.1	-0.12	-0.02	-0.50**
	[0.27]	[0.25]	[0.25]	[0.22]	[0.22]	[0.27]	[0.25]	[0.25]	[0.22]	[0.22]
Weekly frequency of going to schools	0.18	0.83*	0.06	0.62*	-0.1	0.18	0.83*	0.06	0.62*	-0.1
	[0.46]	[0.43]	[0.33]	[0.34]	[0.37]	[0.46]	[0.43]	[0.33]	[0.34]	[0.37]
Helping for fathers' jobs	0.24	0.33	-0.19	-0.07	-0.08	0.24	0.33	-0.19	-0.07	-0.08
	[0.18]	[0.23]	[0.18]	[0.19]	[0.20]	[0.18]	[0.23]	[0.18]	[0.19]	[0.20]
Helping for mothers' jobs	0.04	-0.27	0.24	0.29	0.06	0.04	-0.27	0.24	0.29	0.06
	[0.17]	[0.20]	[0.16]	[0.18]	[0.21]	[0.17]	[0.20]	[0.16]	[0.18]	[0.21]
Helping for household chores	0.03	0.22	-0.27	-0.01	0.05	0.03	0.22	-0.27	-0.01	0.05
	[0.26]	[0.22]	[0.19]	[0.16]	[0.22]	[0.26]	[0.22]	[0.19]	[0.16]	[0.22]
Computer-game shop usage	-0.25	-0.23	0.07	-0.05	0.72**	-0.25	-0.23	0.07	-0.05	0.72**
	[0.31]	[0.27]	[0.19]	[0.19]	[0.29]	[0.31]	[0.27]	[0.19]	[0.19]	[0.29]
Household characteristics										
Fathers' education	0.05	0.02	0.00	0.02	0.06	0.05	0.02	0.00	0.02	0.06
	[0.05]	[0.05]	[0.06]	[0.05]	[0.06]	[0.05]	[0.05]	[0.06]	[0.05]	[0.06]
Mothers' education	-0.09	0.12	0.04	0.05	0.02	-0.09	0.12	0.04	0.05	0.02
	[0.08]	[0.07]	[0.06]	[0.05]	[0.06]	[0.08]	[0.07]	[0.06]	[0.05]	[0.06]
log per capita income	0.25	0.18	0.14	0.31*	0.54**	0.25	0.18	0.14	0.31*	0.54**
	[0.21]	[0.24]	[0.21]	[0.17]	[0.26]	[0.21]	[0.24]	[0.21]	[0.17]	[0.26]
Fathers' age	0.01	0.01	0.00	-0.02	-0.03	0.01	0.01	0.00	-0.02	-0.03
	[0.02]	[0.03]	[0.03]	[0.02]	[0.02]	[0.02]	[0.03]	[0.03]	[0.02]	[0.02]
Mothers' age	-0.05	-0.04	-0.02	0.03	0.05	-0.05	-0.04	-0.02	0.03	0.05
	[0.04]	[0.04]	[0.04]	[0.03]	[0.04]	[0.04]	[0.04]	[0.04]	[0.03]	[0.04]
Having mobile phone	-0.26	-0.22	0.07	0.12	-0.06	-0.26	-0.22	0.07	0.12	-0.06
	[0.36]	[0.34]	[0.32]	[0.27]	[0.35]	[0.36]	[0.34]	[0.32]	[0.27]	[0.35]
Income share by mothers	0.18	-1.41	-0.25	-1.36	-1.32	0.18	-1.41	-0.25	-1.36	-1.32
	[1.01]	[1.36]	[0.89]	[0.93]	[0.92]	[1.01]	[1.36]	[0.89]	[0.93]	[0.92]
Income share by remittance	-2.02**	-1.30	-2.30***	-2.11**	-1.03	-2.02**	-1.30	-2.30***	-2.11**	-1.03
	[0.98]	[1.09]	[0.85]	[0.80]	[0.99]	[0.98]	[1.09]	[0.85]	[0.80]	[0.99]
CCT beneficiary indicator	-0.21	0.28	-0.07	0.10	0.59*	-0.21	0.28	-0.07	0.10	0.59*
	[0.37]	[0.35]	[0.32]	[0.27]	[0.31]	[0.37]	[0.35]	[0.32]	[0.27]	[0.31]
Female-headed indicator	-0.51	1.85	-1.06	-1.55	0.72	-0.51	1.85	-1.06	-1.55	0.72
	[1.17]	[1.76]	[1.44]	[1.37]	[1.66]	[1.17]	[1.76]	[1.44]	[1.37]	[1.66]
Separated father indicator	-0.99	-0.44	-1.24**	-0.39	-0.95	-0.99	-0.44	-1.24**	-0.39	-0.95
	[0.64]	[0.68]	[0.55]	[0.42]	[0.62]	[0.64]	[0.68]	[0.55]	[0.42]	[0.62]

(Continued to next page)

Appendix Table 3: Full Report of Estimations (Cont.)

Independent variables	Δz (z_{NAT} - z_{RC}) without Male×TGR interactions					Δz (z_{NAT} - z_{RC}) with Male×TGR interactions				
	Filipino	Math	English	Science	AP	Filipino	Math	English	Science	AP
Separated mother indicator	-0.14	-0.04	-0.19	-0.72*	0.62	-0.14	-0.04	-0.19	-0.72*	0.62
	[0.70]	[0.69]	[0.60]	[0.43]	[0.59]	[0.70]	[0.69]	[0.60]	[0.43]	[0.59]
Father: land-owning farmer	1.43**	1.69*	0.43	1.71**	1.20*	1.43**	1.69*	0.43	1.71**	1.20*
	[0.60]	[0.94]	[0.77]	[0.69]	[0.60]	[0.60]	[0.94]	[0.77]	[0.69]	[0.60]
Father: tenant farmer	0.31	-0.48	0.28	0.57	0.25	0.31	-0.48	0.28	0.57	0.25
	[0.53]	[0.61]	[0.49]	[0.51]	[0.60]	[0.53]	[0.61]	[0.49]	[0.51]	[0.60]
Father: agricultural wage laborer	-0.56	-0.38	0.33	0.02	0.70	-0.56	-0.38	0.33	0.02	0.70
	[0.61]	[0.66]	[0.42]	[0.43]	[0.48]	[0.61]	[0.66]	[0.42]	[0.43]	[0.48]
Father: fisherman	-0.16	-0.58	-0.14	-0.27	0.14	-0.16	-0.58	-0.14	-0.27	0.14
	[0.47]	[0.42]	[0.45]	[0.36]	[0.54]	[0.47]	[0.42]	[0.45]	[0.36]	[0.54]
Father: proprietor	1.41	1.61*	1.16	1.31	0.81	1.41	1.61*	1.16	1.31	0.81
	[1.03]	[0.88]	[1.00]	[0.80]	[0.94]	[1.03]	[0.88]	[1.00]	[0.80]	[0.94]
Working mother indicator	0.1	0.82	0.09	0.25	0.22	0.1	0.82	0.09	0.25	0.22
	[0.58]	[0.64]	[0.50]	[0.45]	[0.48]	[0.58]	[0.64]	[0.50]	[0.45]	[0.48]
Mother: land-owning farmer	0.97	0.49	1.82	1.13	0.09	0.97	0.49	1.82	1.13	0.09
	[0.81]	[1.02]	[1.19]	[0.86]	[0.84]	[0.81]	[1.02]	[1.19]	[0.86]	[0.84]
School variables										
Public school indicator (=1)	-1.78	-3.61***	-2.77**	-2.33**	-1.62	-1.78	-3.61***	-2.77**	-2.33**	-1.62
	[1.32]	[1.27]	[1.25]	[1.12]	[1.24]	[1.32]	[1.27]	[1.25]	[1.12]	[1.24]
Indiactor of walking to school (=1)	0.57	0.24	0.13	0.69	-0.55	0.57	0.24	0.13	0.69	-0.55
	[0.50]	[0.49]	[0.44]	[0.46]	[0.46]	[0.50]	[0.49]	[0.44]	[0.46]	[0.46]
Distance to school (km)	-0.03	0.01	0.05	0.02	-0.09	-0.03	0.01	0.05	0.02	-0.09
	[0.07]	[0.06]	[0.05]	[0.05]	[0.08]	[0.07]	[0.06]	[0.05]	[0.05]	[0.08]
Minutes to schools (min.)	-0.01	0.00	-0.01	-0.02	0.04	-0.01	0.00	-0.01	-0.02	0.04
	[0.02]	[0.02]	[0.01]	[0.01]	[0.02]	[0.02]	[0.02]	[0.01]	[0.01]	[0.02]
Female TGR (own subject)	-0.10	-7.85	-10.13	-24.06	-88.34	-0.10	-7.85	-10.13	-24.06	-88.34
	[15.18]	[19.81]	[14.16]	[20.72]	[113.39]	[15.18]	[19.81]	[14.16]	[20.72]	[113.39]
Male × Female TGR (own subject)						-12.68	-94.32***	-5.94	-53.31**	-239.54**
						[24.27]	[28.69]	[20.23]	[20.73]	[95.54]
Constant	1.49	6.21	10.29	17.55	70.22	1.49	6.21	10.29	17.55	70.22
	[14.21]	[15.05]	[12.48]	[17.55]	[97.77]	[14.21]	[15.05]	[12.48]	[17.55]	[97.77]
Adj. R^2	0.20	0.28	0.20	0.37	0.30	0.20	0.28	0.20	0.37	0.30
No. of Obs.	115	113	115	111	104	115	113	115	111	104

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

Notes: Numbers in brackets are robust standard errors. The full-model estimations in which the region effect, school effect, male-specific part of school effect, and time-allocation patterns are controlled for.

Source: Author's own calculations.