동남아시아연구 34권 1호(2024) : 257～291
DOI : 10.21652/kaseas.34.1.202402.257

Exploring the Gender Gap in Reading Literacy: A Case Study of Cambodia's PISA for Development

Jin HUH* · Sung Sang YOO**

Abstract

The objective of this study is to explore the gender disparities highlighted in the PISA for Development results, particularly focusing on the reading literacy challenges faced by Cambodian boys. This study seeks to understand the contextual factors and unique challenges underpinning this trend, set against Cambodia's evolving educational landscape.

While prior research has largely centered on gender disparities in education with an inclination towards the challenges faced by girls, especially in male-dominant society as Cambodia, this study reviews the growing issues of boys' academic underperformance.

Using the PISA-D dataset, the study conducts a quantitative analysis of the academic outcomes of 15-year-old students enrolled in Cambodian schools. Employing a two-step approach, the study first undertakes a series of t-test to determine the significant differences in the educational context of boys and girls, and then conducts mediation analysis to evaluate the impact of the different context on reading performance.

According to the PISA-D sample of the 15-year-olds who were already

* 서울대학교 글로벌교육협력 박사과정 수료, misuzuj@snu.ac.kr
** 교신저자, 서울대학교 교육학과 교수, sungsang@snu.ac.kr

enrolled in schools, Cambodian girls significantly receive more concentrated engagements from their parents than boys, contrary to prevailing perceptions. Also, while household chores have traditionally been a focal point for girls, Cambodian boys also are faced with familial obligations related to out-of-home labors. Attitude to schooling did not show significant difference for boys and girls. These accumulated differences contribute, in part, to the comparatively lower reading literacy performance.

The findings underscore the intricate dynamics of gender within Cambodian education. They hint at an urgent need for educational reforms that encompass the distinct challenges faced by both genders. Moreover, with the evolution of socio-cultural norms and the recognition of boys' academic struggles, strategies to address these newfound challenges must be identified to ensure an equitable academic landscape.

Key Words: Gender Disparity, Reading Literacy PISA for Development, Cambodian Education

Ⅰ. Introduction

In the dynamic modern landscape, education stands as a beacon with the potential for transformation. Education, in its essence, can reshape societies, uplift generations, and, as Paulo Freire poignantly described, become “the practice of freedom” - a means through which individuals critically and creatively engage with reality, fostering societal transformation (Freire 1972). Due to such profound potential, education is intrinsically linked to the major international agendas on development (UNESCO 2015).

Reflecting this ideal, the global consensus on the education agenda has been reached on the need to pursue not only wider access to

education but also equal access to quality education. Building upon the foundation laid by the Millennium Development Goals (MDGs), the Sustainable Development Goals (SDGs) introduced in 2015 further accentuated the emphasis on quality and inclusion. Goal 4 of the SDGs specifically aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all."

In the ongoing global effort to achieve educational equity and quality, the importance of international large-scale student assessments such as Trends in International Mathematics and Science Study (TIMSS) or Programme for International Student Assessment (PISA) grew even further. Both TIMSS and PISA were integrated into the SDGs as the official proxy for measuring the 'minimum proficiency level' of the students (UIS 2023). While this movement encouraged more countries to join such cross-national standardized assessments, developing countries often faced issues and challenges in joining such program as they were often heavily demanding on human resources and funds (Lockheed 2013). In this context, the Organisation for Economic Co-operation and Development (OECD) had launched the PISA for Development (PISA-D) project in 2014, to support such countries which hoped to join the main PISA cycle but did not have the capacity. The PISA-D project spanned for four years, with the total participating countries of nine countries. The main survey was conducted in December 2017, and the results were published in 2018 (OECD 2019).

Cambodia, being one of the countries to have joined the PISA-D program, published its national report in December 2018. This report by the Ministry of Education, Youth, and Sport (MoEYS), underscored

various educational challenges faced by the country, including high dropout rates, grade repetitions, and low academic performance. The PISA-D results also revealed several positive aspects as well, such as the influence of socio-economic status on student performance being relatively modest in Cambodia, accounting for only 4% to 7% of the variance in learning outcomes. This figure is mild compared to trends observed in OECD and ASEAN countries. In terms of gender disparities, the gap in Cambodia was also relatively narrow, with boys and girls exhibiting nearly similar performances in mathematics and science (MoEYS 2018).

Nevertheless, a significant disparity was observed in reading, where boys underperformed compared to girls. This aligns with the global trend, as evidenced by the more recent PISA 2022 results, where girls outperformed boys in reading by an average of 24 points across OECD countries. While the gap in Cambodia was comparatively smaller, with girls surpassing boys by 17 points, this gap did not close between PISA-D and PISA 2022 (MoEYS 2018; OECD 2023). This continuing disparity reflects more significant concerns in the Cambodian context in terms of gender equity. For instance, boys are 1.4 times more likely to repeat grades than their female counterparts (MoEYS 2018). Given Cambodia's male-dominant societal structure, the relatively scant attention to boys' educational performance, especially in reading, is indeed perplexing.

In this context, this study aims to explore the factors influencing gender disparities in reading competency among Cambodian students. Specifically, this investigation utilizes PISA-D data to focus on (1) how student contextual factors, such as parental engagement, learning

motivation, and household responsibilities, affect reading literacy in Cambodia, and (2) their relationship to the gender gap in this context. By examining the multifaceted aspects of the gender gap in Cambodia, this study endeavors to contribute not only to the development of gender-sensitive educational policies in Cambodia but also to enhance the broader academic discourse on gender disparities in educational achievement.

Ⅱ. Literature Review

1. Gender Issues in Reading Competency

Gender disparity has been a long-standing issue in the history of education. Girls faced multiple barriers, ranging from lower enrollment rates to a curriculum that mirrored and perpetuated societal expectations, confining them to traditional roles. In this traditional system, girls were often relegated to a secondary status, with educational systems and curricula structured to prioritize male students and perpetuate societal gender norms (King et al. 1993; Salomone 2003).

The factors fueling this disparity were manifold. Societal norms and cultural practices often prioritized boys' education, viewing them as future breadwinners (Sen 2001). Economic constraints in many families meant that if a choice had to be made between sending a son or a daughter to school, the former was often preferred (Duflo 2012). Additionally, the unequal distribution of household chores and

the lack of girl-friendly school infrastructure further aggregated the gender disparity in education (UNICEF 2016b).

In recognition of these disparities, global movements advocated for gender equity in education. Countries worldwide initiated policies and campaigns to address this imbalance, leveraging tools like scholarships, girl-specific enrollment drives, and gender-sensitive curricula. For instance, Rwanda launched targeted initiatives like the Girls' Education Policy and Strategy in 2008. This policy framework emphasized incentives for girls to complete secondary education and community outreach to break down gender biases (Ministry of Education 2008). Bangladesh, facing high dropout rates for girls, especially in rural areas, introduced several measures to ensure gender parity in educational attainment. The introduction of stipend programs, specifically the Female Secondary School Assistance Project (FSSAP), supported by the World Bank, aimed to reduce financial barriers and incentivize the enrollment and retention of girls in secondary schools (World Bank 2009). Nepal, through its School Sector Reform Plan (SSRP) of 2009, focused on strategies such as scholarships for girls, recruiting more female teachers, and enhancing school infrastructures to make them more girl-friendly (Ministry of Education 2009).

Through collective global efforts, significant strides have been made towards achieving enrollment equity in education. The World Bank's 2022 report highlights this achievement, showcasing near parity in enrollment rates at 90% for boys and 89% for girls. Yet, a deeper dive into these figures reveals a nuanced landscape of enduring disparities, especially in developing countries. Only 63% of

girls in these regions complete primary education, compared to 67% of boys. The disparity widens at the lower secondary level, with 36% of girls and 44% of boys completing their education. The trend continues into upper secondary education, with completion rates at 21% for females and 26% for males. Notably, these differences are even more pronounced in countries affected by fragility, conflict, and violence. Additionally, challenges such as early marriages, household responsibilities, and gender-based violence remain significant barriers preventing numerous girls from both accessing and completing their education (UNICEF 2016b; World Bank 2022).

While there is continued emphasis on addressing historical gender disparities, another concerning issue is academic performance. Recent results from global assessments such as PISA and Trends in International Mathematics and Science Study (TIMSS) highlight that boys are trailing significantly behind girls in their performance, especially in reading competency. For instance, the most recent PISA 2022 results show that among OECD countries, girls outperform boys in reading by 24 points (OECD 2023). In TIMSS 2019, it was reported that while fourth-grade boys outperformed girls in mathematics in nearly half the countries, on the subject of science, fourth-grade girls outperformed boys in 18 countries, and eighth-grade girls outperformed boys in 15 countries (Mullis et al. 2020). A World Bank report even suggested that, in the Middle East and the North Africa region, there was a “pervasive” amount of gender gap, amounting to a learning crisis for boys (World Bank 2020). In a country-specific example, Reeves and Smith (2022) elucidated that American boys from disadvantaged backgrounds face substantial

challenges in education, manifesting in lower literacy skills and academic engagement compared to their female counterparts.

Many studies have delved into the factors behind boys' disengagement from education, which is evidenced by higher drop-out rates and lower literacy levels compared to their female counterparts. One prominent explanation is by Owens (2016), who highlights that boys are notably more susceptible to behavioral problems, which can adversely affect their academic trajectory. This vulnerability of boys to behavioral issues, especially in the face of familial challenges, is further elaborated upon by Bertrand and Pan (2013). Moreover, Autor et al. (2016) emphasize that boys and girls experience divergent impacts from both the familial environment in terms of quality and quantity of inputs during their formative years and from the schooling environment to which they are exposed. In support of this, Baker and Milligan (2016) demonstrated that even though parents invest comparable amounts of time in boys and girls, the nature of the engagement differs. Specifically, they found that parents are more inclined to involve themselves in reading activities with girls, potentially laying the foundation for a gender disparity in literacy skills from early childhood. Furthermore, Terrier (2020) posits that ingrained gender biases in educators can significantly influence student progress and educational choices, further exacerbating the gender gap in academic outcomes.

2. Educational Situation of Cambodia

The modern Cambodian education system is structured into three

key phases: primary education (grades 1-6), lower secondary education (grades 7-9), and upper secondary education (grades 10-12). Education is mandatory up to grade 9, reflecting the government's commitment to ensuring universal access to basic education. However, despite this mandate, the system faces notable challenges. According to UNESCO Institute for Statistics (UIS) data, Cambodia's school-age population is estimated to be 1,973,463 for primary, 962,028 for lower secondary, and 923,745 for upper secondary education. While the primary education completion rate stands at 82.3%, there is a significant drop to 56.0% for lower secondary and an even more drastic decrease to 26.7% for upper secondary, highlighting a critical issue with school drop-out rates (UIS n.d.). Additionally, the quality of education remains a concern, as evidenced by the PISA-D results showing that only 2.1% of 15-year-olds in Cambodia achieve a baseline level of performance in reading (MoEYS 2018)

In terms of gender equity, while it had been encouraging that the boys and girls showed similar rates of enrollment at all levels, it was revealed that boys were 1.4 times more likely than girls to leave school prematurely. Additionally, in reading literacy, boys lagged behind girls by 17 points, and in science, the gap was 4 points in favor of the girls. In mathematics, the gender difference wasn't statistically significant (MoEYS 2018). This trend of female academic dominance was also evident in the SEA-PLM 2019 results, where Cambodian girls consistently outperformed their male peers. Specifically, Grade 5 girls surpassed boys by 7 points in reading, 12 points in writing, and 3 points in mathematics (MoEYS 2021b).

What is particularly intriguing is that these academic achievements occur in a male-dominant nation. Societal norms have often assigned roles that emphasized the primacy of men in leadership, decision-making, and economic activities, while women were relegated to more domestic roles (Gorman et al. 1999; Jacobson 2008; Khourn 2019). In 1998, this gender bias was mirrored in the enrollment rates, with the net enrollment rate in primary school for males at 91.0%, whereas it was only 78.3% for females. The gap widened even more in secondary education, with 21.5% enrollment for males compared to just 11.7% for females (World Bank, n.d.).

Given these disparities, Cambodia developed five-year plans for development in the education sector, known as the Education Strategic Plans (ESPs). In conjunction with the MDGs and the EFA goals, the government set out various initiatives and projects to achieve gender equity in education. Various incentive programs were introduced to provide immediate relief and promote inclusivity. For instance, secondary school scholarship programs were explicitly tailored to favor the enrollment of students from underprivileged backgrounds, primarily focusing on girls, ethnic minorities, and other marginalized groups (MoEYS 2004). In addition, to cater to female students' distinct needs, educational institutions' infrastructure was improved, evidenced by the establishment of dedicated dormitories for girls (MoEYS 2004). Training programs were also provided, equipping more school principals and counselors with the necessary skills to offer guidance to girls who were having problems at school (MoEYS 2009).

International development partners have supported efforts to

promote gender equity within Cambodia's education sector. For instance, the scholarship program launched by the Japan Fund for Poverty Reduction (JFPR) in the 2004 school year awarded scholarships to economically disadvantaged girls completing their sixth grade, which is the final year of primary school (Filmer et al. 2008). A more comprehensive example is the Enhancing Education Quality Project (EEQP), supported by the Asian Development Bank (ADB), which aimed to provide holistic support in improving the overall educational system. This project focused on enhancing learning materials, laboratories, and libraries to increase learning resources and boost student enrollment. This project gave special attention to aiding female students in rural areas. Specific measures of the EEQP included updating facilities for the safety of female staff and students and providing scholarships, mainly targeting female teacher trainees (ADB 2008; Heng 2022).

As of 2022, Cambodia was reviewed to have shown significant progress towards achieving gender equity in educational access (World Bank 2023). While international partners and NGOs remain involved in efforts to address gender disparities, especially regarding girls' education in rural areas, MoEYS has taken on an increasingly active role. For instance, scholarship programs that international partners like UNICEF once aided are now funded by MoEYS's budget (UNICEF 2016a). According to the Education Congress Report 2020-2021, nearly 60% of the beneficiaries of these scholarships are now female students (MoEYS 2021a).

While Cambodia has dedicated considerable resources and effort to bolstering girls' education, there remains a paucity of literature

specifically addressing boys' educational challenges. Data from both PISA-D and SEA-PLM 2019 underscore the elevated drop-out and grade repetition rates for boys and their notably lower academic performance compared to girls, particularly in reading.

Ⅲ. Research Methods

1. Data

The dataset for this research is sourced from PISA-D project, an initiative launched by the OECD to extend PISA's influence to a broader scope of low and middle-income nations. Nine countries — Bhutan, Ecuador, Guatemala, Honduras, Panama, Paraguay, Senegal, Zambia, and Cambodia — partook in this initiative. Collectively, data was compiled from 34,604 students and 15,169 teachers spanning 1,299 schools. For Cambodia, the sample encompassed 5,162 students and 4,263 teachers from 170 distinct schools. Abiding by OECD's technical guideline for two-stage sampling, 41 fifteen-year-old pupils were selected from each institution, with the solitary deviation being minor schools where every student was encompassed in the sample.

2. Model of Analysis

This study adopted a two-fold methodology to analyze the distinct educational contexts of boys and girls in Cambodia and discern how

these variations influence academic outcomes.

Firstly, t-tests were applied to the contextual questionnaires, focusing on variables related to parental engagement, attitude to schooling, and external familial obligations. This aimed to pinpoint the significant disparities in the educational contexts of boys and girls. Although the PISA-D National Report supplies overarching data regarding these differences, individual regressions for each questionnaire were meticulously undertaken to extrapolate the nuanced differences between the two genders.

In the second phase, having noted these differences, a mediation analysis was executed to gauge the magnitude of their impact on academic performance. Given that the reported average performance disparity in reading between boys and girls stood at 17 points, the analysis focused on determining how mediating factors influenced this gap.

Conforming to the standard PISA 2015 protocol, PISA-D employed a system of ten plausible values (PVs) grounded in the multiple imputation method, aiming to gauge estimations of students' aptitude in distinct domains (OECD 2018). In this study, all of these PVs have been utilized as the independent variables, adhering to OECD's advisement on aggregating all ten PVs to avoid biased results (OECD 2009).

The analytical tool used for this study was the R software, version 3.6. Given that PISA-D adopts the Balanced Repeated Replication (BRR) technique with Fay's modification, R's 'survey' library was specifically chosen. This library encompasses the requisite functions to implement weights and replication designs effectively. Out of the

initial sample size of 5,162, students with missing or invalid gender data were omitted, resulting in a final sample size of 4,412, with 2,341 girls and 2,071 boys.

The description of all the variables used in the analysis is listed in Table 1. While the total eligible sample size was 4,814, missing responses were further omitted for individual regressions. Variables related to parental engagement and attitude to schooling were categorical (ordinal) variables, while the ones related to familial obligations were binary variables

Table 1. List of the Selected Variables

Type	Variable Name	Explanation
Parental Engagement	ST083Q03NA	How often do your parents discuss how well you are doing at school?
	ST083Q04NA	How often do your parents eat the main meal with you?
	ST083Q05NA	How often do your parents spend time just talking to you?
	ST083Q06NA	How often do your parents talk to you about the importance of completing secondary school?
	ST083Q07NA	How often do your parents talk to you about any problems you might have at school?
	ST083Q08NA	How often do your parents ask you about how well you are getting along with kids at school?
	ST083Q09NA	How often do your parents encourage you to get good grades?
	ST083Q11NA	How often do your parents take an interest in what you are learning at school?
	ST083Q12NA	How often do your parents talk to you about your future education?
	ST083Q13NA	How often do your parents ask you what you did in school that day?

Type	Variable Name	Explanation
Attitude to Schooling	ST067Q03TA	To what extent do you agree that school has helped give you confidence to make decisions?
	ST067Q04TA	To what extent do you agree that school has taught you things which could be useful in a job?
	ST067Q05TA	To what extent do you agree that trying hard at school will help you get a good job?
	ST067Q06TA	To what extent do you agree that trying hard at school will help you get into a good college?
	ST067Q07TA	To what extent do you enjoy receiving good grades?
	ST067Q08TA	To what extent do you agree that trying hard at school is important?
Familial Obligations	ST020Q01NA	In the past week, did you work for payment for someone who is not a member of your household?
	ST020Q02NA	In the past week, did you fetch water for household use?
	ST020Q03NA	In the past week, did you collect firewood for household use?
	ST020Q04NA	In the past week, did you work on your family farm, in your family business, or selling goods on the street?
	ST020Q05NA	In the past week, did you help in the care of children, or an elderly or sick person?
	ST020Q06NA	In the past week, did you help with other household chores such as shopping, cleaning, washing clothes, or cooking?

Among the enumerated variables, those linked to parental engagement were in five-level ordinal categories. They ranged from 1 to 5, where “1” denoted “Never or hardly ever” and “5” corresponded to “Several times a week.” The variables on attitude to schooling were four-tiered. For the analysis, these were recoded such that 4 represents “Strongly Agree,” 3 is “Agree,” 2 stands for “Disagree,” and 1 indicates “Strongly Disagree.” It should be noted that the original codification was reversed. Variables associated with familial obligations were binary, labeled as either 0 for “No” or 1 for “Yes.”

Ⅳ. Findings

1. Descriptive Statistics

The descriptive statistics on parental engagements in Table 2 show differences and similarities between boys and girls. Notable gaps were observed in areas such as school performance discussions (ST083Q03NA), frequency of parents eating the main meal with their children (ST083Q04NA), or encouragement for good grades (ST083Q09NA), whereas lower levels of parental engagement were reported for girls. In contrast, conversations about future education (ST083Q12NA) and daily school activities (ST083Q13NA) exhibit more parity between genders, indicating a shared parental emphasis on these aspects. These findings underscore the nuanced ways in which parental involvement varies across different aspects of academic and social life for boys and girls.

Table 2. Descriptive Statistics, Parental Engagement

Variable	Total						By Gender (Boys in Parentheses)					
	Mean	Percentage of Responses					Mean	Percentage of Responses				
		1	2	3	4	5		1	2	3	4	5
ST083Q 03NA	3.18	13.71	16.00	28.08	22.69	19.51	3.24 (3.12)	11.32 (16.42)	15.98 (16.03)	30.07 (25.83)	22.73 (22.65)	19.91 (19.07)
ST083Q 04NA	3.99	12.28	7.55	4.35	20.40	55.42	4.09 (3.87)	10.55 (14.24)	6.49 (8.74)	4.10 (4.64)	20.72 (20.04)	58.14 (52.34)
ST083Q 05NA	3.60	15.34	10.13	9.90	28.33	36.29	3.72 (3.46)	13.24 (17.72)	9.27 (11.11)	9.70 (10.14)	27.34 (29.45)	40.45 (31.58)
ST083Q 06NA	3.22	17.54	16.21	16.75	25.27	24.23	3.27 (3.17)	16.70 (18.49)	15.76 (16.71)	16.40 (17.14)	25.84 (24.63)	25.29 (23.03)

Variable	Total						By Gender (Boys in Parentheses)					
	Mean	Percentage of Responses					Mean	Percentage of Responses				
		1	2	3	4	5		1	2	3	4	5
ST083Q 07NA	3.07	23.87	13.49	17.45	22.48	22.71	3.09 (3.04)	23.84 (23.90)	13.20 (13.81)	16.32 (18.73)	23.54 (21.29)	23.11 (22.26)
ST083Q 08NA	3.08	23.55	13.64	17.27	22.19	23.35	3.10 (3.07)	24.01 (23.03)	12.99 (14.39)	16.92 (17.67)	21.66 (22.79)	24.43 (22.11)
ST083Q 09NA	3.87	7.05	11.42	12.13	26.00	43.40	3.94 (3.80)	5.81 (8.45)	10.89 (12.02)	11.83 (12.46)	26.44 (25.49)	45.02 (41.57)
ST083Q 11NA	3.70	9.18	12.01	14.30	28.60	35.90	3.74 (3.66)	8.97 (9.42)	11.66 (12.41)	13.46 (15.26)	28.24 (29.02)	37.68 (33.90)
ST083Q 12NA	3.54	10.06	16.64	14.73	26.25	32.32	3.58 (3.49)	9.10 (11.15)	16.92 (16.32)	14.18 (15.35)	26.23 (26.27)	33.58 (30.90)
ST083Q 13NA	3.55	13.24	12.17	14.66	26.34	33.59	3.57 (3.53)	13.50 (12.94)	11.92 (12.46)	13.80 (15.64)	25.72 (27.04)	35.07 (31.92)

The data presented in Table 3 illustrates students' attitudes towards schooling, highlighting the parallels between boys and girls. The statistics reveal a notable congruence in their viewpoints across various aspects of the educational experience. Both genders demonstrate a high level of satisfaction with learning, indicating a shared recognition of the value of their school experience. While the most pronounced difference is observed in the enjoyment of receiving good grades (ST067Q07TA), this disparity is relatively marginal. Overall, the consistency in responses underscores a collective educational perspective that is largely unaffected by gender differences. Such findings suggest that both boys and girls equally appreciate the role of schooling in their personal and academic development.

Table 3. Descriptive Statistics, Attitude to Schooling

Variable	Total					By Gender (Boys in Parentheses)				
	Mean	4	3	2	1	Mean	4	3	2	1
ST067Q 03TA	3.44	0.50	1.88	51.13	46.49	3.42 (3.45)	0.43 (0.58)	1.88 (1.88)	52.84 (49.20)	44.85 (48.33)
ST067Q 04TA	3.58	0.59	1.43	36.94	61.04	3.58 (3.59)	0.56 (0.63)	1.32 (1.55)	37.89 (35.88)	60.23 (61.95)
ST067Q 05TA	3.60	0.63	1.59	35.06	62.72	3.60 (3.61)	0.60 (0.68)	1.75 (1.40)	35.50 (34.57)	62.15 (63.35)
ST067Q 06TA	3.55	0.70	2.02	38.76	58.52	3.55 (3.55)	0.51 (0.92)	1.75 (2.32)	40.07 (37.28)	57.67 (59.49)
ST067Q 07TA	3.58	0.54	1.16	38.24	60.06	3.60 (3.55)	0.38 (0.72)	0.85 (1.50)	37.12 (39.50)	61.64 (58.28)
ST067Q 08TA	3.51	0.82	1.61	42.93	54.65	3.52 (3.51)	0.60 (1.06)	1.45 (1.79)	43.49 (42.30)	54.46 (54.85)

Regarding familial obligations, as in Table 4, there was a definite gap between the genders. Boys were more likely to respond positively to having to work outside the household (ST020Q01NA, ST020Q02NA, ST020Q03NA, ST020Q04NA), while girls were more likely to respond that they must help with household chores (ST020Q06NA). The mean of the responses related to the obligation of taking care of other household members was quite similar between the genders, with a mean difference of －0.03 (ST020Q05NA).

Table 4. Descriptive Statistics, Familial Obligations

Variable	Total			By Gender (Boys in Parentheses)		
	Mean	0 (No)	1 (Yes)	Mean	0 (No)	1 (Yes)
ST020Q01NA	0.19	80.76	19.24	0.15 (0.24)	84.84 (76.15)	15.16 (23.85)
ST020Q02NA	0.59	40.55	59.45	0.55 (0.64)	44.60 (35.97)	55.40 (64.03)

Variable	Total			By Gender (Boys in Parentheses)		
	Mean	0 (No)	1 (Yes)	Mean	0 (No)	1 (Yes)
ST020Q03NA	0.42	57.59	42.41	0.39 (0.47)	61.30 (53.40)	38.70 (46.60)
ST020Q04NA	0.44	56.07	43.93	0.40 (0.48)	59.68 (52.00)	40.32 (48.00)
ST020Q05NA	0.55	44.54	55.46	0.54 (0.57)	45.62 (43.31)	54.38 (56.69)
ST020Q06NA	0.88	11.65	88.35	0.92 (0.85)	8.24 (15.50)	91.76 (84.50)

2. T-test Results: Contextual Differences between Boys and Girls

T-tests have been conducted to analyze the significant difference between the contextual backgrounds of the genders. Table 5 provides a detailed comparison. As reviewed in the descriptive statistics, the results indicate that parents of female students tend to spend more time with them, especially during main meals (ST083Q04NA), conversing (ST083Q03NA, ST083Q05NA), and encouraging them to secure good grades (ST083Q09NA). Despite these distinctions, the effect size for male students was relatively small. This suggests that parents' attitudes and engagement levels don't differ drastically based on the child's gender.

These results seem to contrast the previous literature, which often emphasized the male-dominant social environment in the country that preferred sending boys to school over girls. However, it should be noted that the results presented focus on students already enrolled in schools. It is plausible that families who choose to enroll their

daughters might already hold more progressive views and thus engage more with their girls.

In terms of attitude to schooling, there was negligible gender-based differentiation in the responses. Most students, regardless of gender, seem to perceive schooling as an important factor for future job prospects and college admissions, and effort was valued. However, there was a difference in one variable, ST067Q07TA, which gauges the enjoyment derived from receiving good grades. Still, the difference is quite small, with a mean difference of 0.05, suggesting that while girls derive more pleasure from high academic achievement than their male counterparts, the difference is not huge.

Table 5. T-Test Results: Contextual Difference between Gender

Variable	Mean Difference	t	df	p-value	standard error	confidence interval (95%)	
						lower	upper
Parental Engagement							
ST083Q03NA	0.12	3.06***	4,263.15	0.00	0.02	0.04	0.20
ST083Q04NA	0.22	5.11***	4,219.42	0.00	0.02	0.14	0.30
ST083Q05NA	0.26	6.07***	4,292.98	0.00	0.02	0.18	0.35
ST083Q06NA	0.10	2.38**	4,338.27	0.02	0.02	0.02	0.19
ST083Q07NA	0.05	1.04	4,354.09	0.30	0.02	-0.04	0.13
ST083Q08NA	0.03	0.66	4,366.47	0.51	0.02	-0.06	0.12
ST083Q09NA	0.14	3.69***	4,258.21	0.00	0.02	0.07	0.22
ST083Q11NA	0.08	2.13**	4,344.81	0.03	0.02	0.01	0.16
ST083Q12NA	0.09	2.16**	4,324.86	0.03	0.02	0.01	0.17
ST083Q13NA	0.04	1.05	4,364.75	0.30	0.02	-0.04	0.13
Attitude to Schooling							

Variable	Mean Difference	t	df	p-value	standard error	confidence interval (95%)	
						lower	upper
ST067Q03TA	-0.03	-1.88*	4,320.82	0.06	0.01	-0.06	0.00
ST067Q04TA	-0.01	-0.81	4,333.14	0.42	0.01	-0.05	0.02
ST067Q05TA	-0.01	-0.83	4,352.98	0.41	0.01	-0.05	0.02
ST067Q06TA	-0.00	-0.26	4,278.19	0.80	0.01	-0.04	0.03
ST067Q07TA	0.05	2.83***	4,257.00	0.00	0.01	0.01	0.08
ST067Q08TA	0.01	0.50	4,279.25	0.62	0.01	-0.03	0.04
Familial Obligations							
ST020Q01NA	-0.09	-7.27***	4,064.92	0.00	0.01	-0.11	-0.06
ST020Q02NA	-0.09	-5.86***	4,376.44	0.00	0.01	-0.12	-0.06
ST020Q03NA	-0.08	-5.30***	4,317.37	0.00	0.01	-0.11	-0.05
ST020Q04NA	-0.08	-5.13***	4,324.15	0.00	0.01	-0.11	-0.05
ST020Q05NA	-0.02	-1.54	4,349.93	0.12	0.01	-0.05	0.01
ST020Q06NA	0.07	7.42***	3,839.07	0.00	0.00	0.05	0.09

Note: *** indicates significance at 0.001 level / ** indicates significance at 0.01 level / * indicates significance at 0.05 level

The most significant differences could be found in how the students have different familial obligations based on their gender. A notable observation from the table is the clear gender differentiation in tasks that have a monetary aspect or are associated with outdoor work. For instance, when observing the variable ST020Q01NA, which relates to working for payment outside the household, boys were significantly more involved than girls. Similarly, fetching water (ST020Q02NA), collecting firewood (ST020Q03NA), and engaging in family business or farm work (ST020Q04NA) also exhibited pronounced gender disparities, all favoring higher male participation.

An interesting finding was that contradictory to the previous literature on how girls were given more tasks on taking care of children or sick or elderly individuals in the country, at least for the PISA-D participants, the difference was not significant between the genders (ST020Q05NA). Still, girls were significantly more burdened with household chores such as cleaning and cooking than their male counterparts (ST020Q06NA), pointing to a traditional gender role where girls are more frequently engaged in domestic chores.

Overall, not much difference is evident between the genders among school-enrolled students in Cambodia in terms of parental engagement and attitude to schooling. However, a clear distinction emerges in familial obligations: boys are more likely to work inside or outside the home, while girls more frequently handle domestic chores. The following section will review the influence of such distinctions on academic performance.

3. Mediation Regression Results: Impact on Reading Literacy

The descriptive statistics and the t-tests revealed the variables that showed significant differences in parental engagement and familial obligations between genders. As the differences in attitude to schooling were neglectable, only significant variables with meaningful impact sizes were incorporated into the mediation regression analysis. The final model for the mediation analysis was set as below.

Mediators:

$$ST083Q03NA = \alpha_1 + \beta_1 MALE + \epsilon_1$$
$$ST083Q04NA = \alpha_2 + \beta_2 MALE + \epsilon_2$$
$$ST083Q05NA = \alpha_3 + \beta_3 MALE + \epsilon_3$$
$$ST083Q09NA = \alpha_4 + \beta_4 MALE + \epsilon_4$$
$$ST020Q01NA = \alpha_5 + \beta_5 MALE + \epsilon_5$$
$$ST020Q02NA = \alpha_6 + \beta_6 MALE + \epsilon_6$$
$$ST020Q03NA = \alpha_7 + \beta_7 MALE + \epsilon_7$$
$$ST020Q04NA = \alpha_8 + \beta_8 MALE + \epsilon_8$$
$$ST020Q06NA = \alpha_9 + \beta_9 MALE + \epsilon_9$$

Outcome Model:

$$\begin{aligned} ReadingLiteracy = {} & \gamma + b_1 MALE + b_2 ST083Q03NA \\ & + b_3 ST083Q04NA + b_4 ST083Q05NA \\ & + b_4 ST083Q09NA + b_5 ST020Q01NA \\ & + b_6 ST020Q02NA \\ & + b_7 ST020Q03NA + b_8 ST020Q04NA \\ & + b_9 ST020Q06NA + \zeta \end{aligned}$$

Table 6 illustrates the overall results of the mediation analysis. Among the variables, the frequency of parents discussing school performance with their children (ST083Q03NA) showed an insignificant correlation at a 95% significance level. Interpreting the beta values, which indicate the standardized strength of relationships, it can be observed that the frequency with which parents have meals with their children (ST083Q04NA) has the strongest positive association among the three variables tied to parental engagement. However, while there is a statistically significant gender difference

here, its magnitude isn't substantial. Consequently, the broader effect of parental engagement in the context of academic outcomes remains modest.

The effect sizes tied to familial obligations were similar to parental engagement. However, there was a pronounced gender difference, implying that their overall influence, particularly on boys, was likely more correlated. A standout observation is the disproportionately negative effect of domestic chores on boys' reading literacy, even though these chores predominantly fall on girls. This result on boys and household chores that contrasts prevalent views in academic literature might warrant further exploration.

Table 7. Mediation Analysis Results

Variable	Coef.	S.E.	β	p-value	confidence interval (95%)	
					lower	upper
(Intercept)	284.51	5.41			273.89	295.13
MALE	-6.80***	1.90	-0.26	0.00	-10.53	-3.07
ST083Q03NA	-0.30	0.73	-0.03	0.60	-1.73	1.14
ST083Q04NA	7.17***	0.94	0.80	0.00	5.33	9.00
ST083Q05NA	3.88***	0.82	0.41	0.00	2.28	5.50
ST083Q09NA	3.03**	1.06	0.33	0.01	0.95	5.11
ST020Q01NA	-12.81***	2.42	-0.32	0.00	-17.57	-8.06
ST020Q02NA	-15.85***	2.68	-0.68	0.00	-21.01	-10.60
ST020Q03NA	-13.34***	2.71	-0.49	0.00	-18.64	-8.04
ST020Q04NA	-9.44***	2.28	-0.35	0.00	-13.92	-4.98
ST020Q06NA	30.03***	3.63	1.57	0.00	22.92	37.13

Note: *** indicates significance at 0.001 level / ** indicates significance at 0.01 level / * indicates significance at 0.05 level

The key finding is that familial obligations, such as working for payment for someone who is not a member of the household (ST020Q01NA), fetching water for the household (ST020Q02NA), collecting firewood (ST020Q03NA), and working for family business (ST020Q04NA) had apparently significant negative mediation effects on boys' reading performance. As the mediation analysis does not necessarily account for causality, this can either mean that the household work has a negative impact on the boys' reading literacy or that the boys who are not performing well at school require more support in their households. Either way, this implies that such household obligations negatively impact boys' performance in reading literacy.

Ⅴ. Discussions & Conclusion

Cambodia's PISA-D 2018 results highlighted the nation's strides in gender equity in both access to and quality of education. The results also showed the differences between genders. Especially in marginalized areas, girls are still disadvantaged in their access to schools. In contrast, more boys enrolled in schools than girls are struggling with their learning, especially in reading literacy, which often seems to lead to more frequent grade repetition and drop-outs.

This study, delving into the reasons behind the challenges boys face in their schooling in Cambodia, identified two possible factors. Firstly, at least for the students enrolled in their secondary level of education in Cambodia, it was revealed that girls often receive more

concentrated educational attention from their parents than boys do. Secondly, boys were more burdened with familial obligations which was analyzed to have significant negative impact on their academic performance.

It is essential to note once again that the PISA-D results for Cambodia only capture the academic experiences of those already enrolled in schools. Thus, when comparing gender groups based on these results, it does not necessarily imply that Cambodian parents, in general, exhibit a higher level of engagement in girls' education. It might instead suggest that for Cambodian families deciding to educate their daughters, their expectations for academic success might be higher for girls than for boys. While this warrants further investigation, such a possibility aligns with the existing literature, which often suggests that parents might be less inclined to send girls to schools if they perceive that the returns for educating girls are inferior to those for boys.

Regarding the familial obligations shouldered by Cambodian boys, this study shows that while the disproportionate burden of household chores have negative impact on girls' academic performance, boys are also burdened with responsibilities that have a heavier negative impact on their educational pursuits. Many boys are burdened with familial obligations outside the confines of their homes, such as earning money or assisting with labor-intensive tasks like gathering firewood or aiding in family farming. This revelation underscores the intricate interplay of gender roles, familial responsibilities, and educational outcomes.

Historical efforts around gender inequities in education primarily

revolved around enhancing girls' access to quality education. The findings of this study, however, illuminate the evolving intricacies of this issue. The educational challenges faced by girls, while still pressing, are part of a broader tapestry that now includes distinct obstacles confronted by boys. Cambodia's education system has navigated a tumultuous journey, from post-conflict rehabilitation in the late 20th century to adapting to today's rapid globalization. Traditionally, resources were channeled toward boys' education, anticipating their roles as future breadwinners, often sidelining girls' academic needs. Understanding the present-day gender disparities requires acknowledging this trajectory.

While the study, based on PISA-D data, provides insights into the education system in Cambodia, it's important to acknowledge its limitations for a comprehensive understanding. The research focuses on fifteen-year-old students who are currently enrolled in schools. Given Cambodia's significant drop-out rates, this means the study covers only about 21% of the entire population of fifteen-year-olds. This limitation indicates that, while the study offers insights into the challenges faced by in-school adolescents, it does not fully capture the experiences of those out of school. This aspect of Cambodia's education landscape remains an area open for further research.

Furthermore, the methodological choices guiding this research provide a foundational understanding of the gendered academic experiences in Cambodia. Still, it is evident that further rigorous modeling is needed to unearth the latent factors underlying the academic gap. Alternative methodologies, such as qualitative interviews or ethnographic studies, might yield richer insights,

capturing the multifaceted experiences of students in their lived environments.

In conclusion, this study advances the understanding of gender disparities in Cambodian education by highlighting key factors influencing academic performance. Notably, it underscores the significant impact of parental engagement and familial obligations, particularly on boys' reading literacy. This insight is crucial considering the Cambodian government's efforts to address the high grade repetition and drop-out rates, especially among boys at the secondary level.

While this study concentrates on aspects contributing to boys' lower academic performance, it is imperative to stress that educational policies should aim for a balanced approach that benefits all students, regardless of gender. As Cambodia progresses in its educational reform focusing on access, equity, and quality, a nuanced comprehension of these gender-related challenges is vital. This understanding will enable the creation of an inclusive educational environment where both boys and girls can thrive equally, ensuring that educational advancements contribute positively to the nation's overall development.

References

Asian Development Bank (ADB). 2008. *CAM: Enhancing Education Quality Project.* Manila: Asian Development Bank.

Autor, David, David Figlio, Krzysztof Karbownik, Jeffrey Roth and Wasserman Melanie. 2016. "School Quality and the Gender Gap in Educational Achievement." *American Economic Review* 106(5): 289-295.

Baker, Michael and Milligan Kevin. 2016. "Boy-Girl Differences in Parental Time Investments: Evidence from Three Countries." *Journal of Human Capital* 10(4): 399-441.

Bertrand, Marianne, and Pan Jessica. 2013. "The Trouble with Boys: Social Influences and the Gender Gap in Disruptive Behavior." *American economic journal. Applied economics* 5(1): 32-64.

Duflo, Esther. 2012. *Women's Empowerment and Economic Development.* IDEAS Working Paper Series from RePEc.

Filmer, Deon and Schady Norbert. 2008. "Getting girls into school: Evidence from a scholarship program in Cambodia." *Economic Development and Cultural Change* 56(3): 581-617.

Freire, Paulo. 1972. *Pedagogy of the Oppressed*. New York: Herder and Herder

Gorman, Siobhan, Dorina Pon and Kheng Sok. 1999. *Gender and Development in Cambodia: An Overview.*

Hayden, Martin and Vincent McNamara. 2022. *Education in Cambodia : from year zero towards international standards.* Gateway East, Singapore: Springer.

Heng, Molika. 2022. “Cambodia’s gender policy: An analysis of women and girls’ education strategies under the Neary Rattanak IV Strategic Plan.” *Cambodian Journal of Educational Research* 2(1): 37-61.

Jacobson, Trudy. 2008. *Lost Goddesses: The Denial of Female Power in Cambodian History.* Copenhagen: Nordic Institute of Asian Studies.

Khourn, Chantevy. 2019. “Women's Participation in Politics in Cambodia.” A. Sharom, S. Petcharamesree, Y. Sumarlan, V. Boontinand and J. M. Baysa-Barredo (eds.), *Human rights in Southeast Asia: Series Five - Pushing the Boundaries.* SHAPE SEA. 19-34

King, Elizabeth and Anne Hill. 1993. *Women's education in developing countries.* Washington, D.C.: The World Bank Group.

Lockheed, Marlaine. 2013. “Causes and Consequences of International Assessments in Developing Countries.” H.-D. Meyer and A. Benavot (eds.), *PISA, Power, and Policy: the emergence of global educational governance.* Oxford: Symposium Books.

Ministry of Education of Nepal. 2009. *School Sector Reform Plan 2009-2015.*

Ministry of Education of Rwanda. 2008. *Girls' Education Policy.*

Ministry of Education, Youth and Sports (MoEYS). 2004. *Education Strategic Plan 2004-2008.*

_____. 2009. *Education Strategic Plan 2009-2013.*

_____. 2014. *The National Education For All 2015 review report: Cambodia.*

_____. 2018. *Education in Cambodia: Findings from Cambodia's experience in PISA for Development.*

_____. 2021a. *Education Congress Report for the Academic Year of 2020/2021.*

_____. 2021b. *Education in Cambodia: Results from Participation in the SEA-PLM.*

Mullis, Ina. V. S., Michale O. Martin,, Dana L. Kelly, and Bethany Fishbein. 2020. *TIMSS 2019 International Results in Mathematics and Science.* Boston College, TIMSS & PIRLS International Study Center.

OECD. 2009. *PISA Data Analysis Manual: SPSS, Second Edition.* Paris: OECD Publishing.

_____. 2017. *PISA 2015 Results (Volume III): Students' Well-Being.* Paris: OECD Publishing.

_____. 2018. *PISA-D In-School Assessment Technical Report.* Paris: OECD Publishing.

_____. 2023. *PISA 2022 Results (Volume I): The State of Learning and Equity in Education*. Paris: OECD Publishing, Paris

Owens, Jayanti. 2016. "Early Childhood Behavior Problems and the Gender Gap in Educational Attainment in the United States." *Sociology of Education* 89(3): 236-258.

Reeves, Richard. V. and Smith Ember. 2022. "Boys left behind: Education gender gaps across the US." https://www.brookings.edu/articles/boys-left-behind-education-gender-gaps-across-the-us/ (검색일: 2023.10.06.)

Salomone, Rosemary. 2003. *Same, Different, Equal: Rethinking Single-Sex Schooling.* Yale University Press.

Sen, Amartya. 2001. “The many faces of gender inequality.” *New Republic* 225(12): 35-40

Terrier, Camille. 2020. “Boys lag behind: How teachers’ gender biases affect student achievement.” *Economics of Education Review* 77: 101981.

UNESCO. 2015. *Education 2030: Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4.*

UNESCO Institute for Statistics (UIS). 2023. *Reporting learning outcomes in basic education: Country’s options for indicator 4.1.1.*

_____. n.d. UIS databank. http://sdg4-data.uis.unesco.org/ (검색일: 2024.02.12.)

UNICEF. 2016a. *Consultant to support the development of a MoEYS scholarship transition strategy.*

_____. 2016b. *Harnessing the power of data for girls: Taking stock and looking ahead to 2030.*

World Bank. 2009. *Bangladesh- Female Secondary School Assistance Project.* Washington, D.C.: The World Bank Group.

_____. 2015. “Cambodia Scholarship Program.” https://www.worldbank.org/en/programs/sief-trust-fund/brief/cambodia-scholarship-program (검색일: 2023.10.23.)

_____. 2018. *World Development Report 2018: Learning to Realize Education’s Promise.* Washington, D.C.: The World Bank Group.

_____. 2020. *Expectations and Aspirations: A New Framework for Education in the Middle East and North Africa.* Washington,

D.C.: The World Bank Group.

_____. 2022. *Girls' Education.* https://www.worldbank.org/en/topic/girlseducation (검색일: 2023.11.5.)

_____. 2023. *Cambodia - Secondary Education Improvement Project.* Washington, D.C.: The World Bank Group.

_____. n.d.. *The World Bank Database.* https://databank.worldbank.org/source/gender-statistics (검색일: 2023.12.17.)

(2023.12.31. 투고, 2024.1.21. 심사, 2024.2.2. 게재확정)

<국문초록>

읽기 소양에서의 성별 격차 연구: 캄보디아 PISA-D 사례를 바탕으로

허진 · 유성상
(서울대학교)

본 연구의 목적은 PISA for Development (PISA-D) 결과에서 나타난 캄보디아 학생들의 성별 간 학업성취도의 격차에 대해 조사하는 것이다. 본 연구는 특히 격차가 제일 심하게 벌어지는 읽기 소양에 대해 분석을 실시하고, 또한 이러한 격차가 발생하는 맥락적 요인에 대해 분석한다. 캄보디아는 여전히 남성 위주의 사회로 알려져 있으며, 이에 성별 격차에 따른 교육 환경에 대한 선행 연구는 주로 여학생의 학교 접근성에 관한 내용을 중점으로 이루어졌다. 본 연구는 이와 다르게 남학생들의 학업 성취도 저하에 대한 내용에 대해 조명하고 있다. 본 연구는 2018년에 시행된 PISA-D 데이터를 사용하여 재학 중에 있는 캄보디아 15세 학생들의 학업 성취 및 맥락적 요인에 대한 양적 분석을 실시하였다. 본 연구는 두 단계 접근법을 적용하여 첫째, 남학생과 여학생의 교육 맥락에서의 유의한 차이점을 파악하기 위해 t검정을 실시하였고, 둘째, 이러한 차이점이 읽기 소양에 미치는 영향을 평가하기 위해 매개 변수 분석을 수행하였다. PISA-D 결과에 따르면, 캄보디아의 15세 학생들 중 여학생이 남학생들보다 상대적으로 부모로부터 더 높은 학업에 대한 관심을 받는다. 또한, 여학생이 전반적으로 가사 노동에 대한 기여도가 높은 것으로 나타났으나 반대로 남학생은 가사 이외의 노동에 대

한 기여도가 높은 것으로 나타났으며, 이러한 차이점은 남학생들의 학업 성취 저하에 일정 수준의 연관성이 있는 것으로 나타났다. 본 연구의 결과는 캄보디아 교육 내에서의 성평등 달성을 위한 다양한 역학을 조망한다. 남학생들은 여학생들과 다른 교육적 변인에 대한 문제에 직면하고 있으며, 이는 학업 성취도 저하라는 결과로 직결되고 있다. 이는 기존 사회적 인식과 교육개혁 정책의 의도치 않은 부작용이 결부되어서 나타나는 것으로 보이며, 평등한 학습 환경 보장을 위한 다변화된 전략의 모색이 필요할 것으로 보인다.

주제어: 성별 격차, 읽기 소양, PISA for Development, 캄보디아 교육