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Stratified Perseverance and Academic Achievement in the Philippines and Vietnam:
Focusing on Educational Differentiation

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This dissertation is dedicated to my parents.

ABSTRACT

Stratified Perseverance and Academic Achievement in the Philippines and Vietnam:
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There has been increasing research on educational inequality, specifically on the effect of parental socioeconomic status (SES) on academic achievements, and many scholars have researched the mechanism behind the effect. However, these studies concentrated on the Western context without consideration of developing countries. Yet accessibility to education is the most important issue for developing countries, making policies that focus on provision of education. Therefore, this dissertation explores perseverance as a critical non-cognitive skill and a mediating factor in educational inequality in the Philippines and Vietnam.

This research investigates the role of perseverance in educational inequality with the case of the Philippines and Vietnam. The Philippines and Vietnam are in Southeast Asia where economic inequality has accelerated. Both are lower middle-income countries that have achieved universal primary education. But they differ in their levels of educational differentiation. Research questions are threefold: 1) Does family SES influence perseverance in the Philippines and

Vietnam? 2) Does perseverance influence academic achievement in the Philippines and Vietnam? 3) Does family SES indirectly influence academic achievement through perseverance in the Philippines and Vietnam?

Data from the Programme for International Student Assessment (PISA) 2018 was analyzed using structural equation modeling (SEM) analysis and a fixed-effects regression. In the Philippines, where educational differentiation is rarely conducted by grades, family SES contributed to shaping student perseverance; students with higher family SES were more likely to have higher levels of perseverance. This was not the case for Vietnamese students who are stratified according to their academic achievement when entering upper secondary at age 15. On the impact of perseverance in academic achievement, the effect was significant for students in the Philippines, while the effect was not significant for students in Vietnam. Lastly, on the role of perseverance to mediate between family SES to academic achievement, it was significant only in the Philippines, and not in Vietnam. In summary, the research findings demonstrate that the role of perseverance is differ between the Philippines and Vietnam.

This dissertation is intended to provide new insight into educational inequality in developing countries. At the same time, this study calls for institutional approaches to non-cognitive skills. The impact of perseverance in the transmission of intergenerational inequalities can differ according to the degree of educational differentiation. In the Philippines where less educational differentiation exists, the role of perseverance is strong in transmitting the inequality; students are more likely to be influenced by family SES as schools are relatively homogenous, so students are not limited by their previous academic results, maximizing the effects of perseverance. However, the role of perseverance is minuscule in Vietnam; family SES effects on perseverance is weak as school differentiation can shape the student's perseverance, and further academic achievement of students is limited by their allocation into upper

secondary school, negating the effect of perseverance. In addition, non-cognitive skills should not only be emphasized as a teachable trait, but should be approached in terms of structure, recognizing how they are influenced by family background. This research calls for further research in educational inequality in developing countries, as there are variations among developing countries in ways educational inequality is transmitted.

Keyword: Educational inequality, Philippines, Vietnam, perseverance, non-cognitive skills, academic achievement, educational differentiation
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CHAPTER I. INTRODUCTION

1.1 Research Background

Educational inequality has been a major topic in sociology of education as educational inequalities is closely related to social inequalities (Blau & Duncan, 1967; Breen & Jonsson, 2005). Many scholars have conducted research on educational inequalities in various country contexts using the classic measurement suggested by Blau and Duncan (1967) to estimate the regression coefficient of family socioeconomic status (SES) effect on educational qualification and achievement. Many tried to identify the factor that mediates the effect of family SES on their children's academic achievement. Various forms of capital may explain this process; cultural capital, social capital and parenting style have been suggested to mediate family SES on their children's educational achievement (DiMaggio & Mohr, 1985; Coleman, 1988; Lareau, 2011).

However, much of the research on educational inequities omitted developing country contexts. Research on education in developing countries have focused on access to education especially on the primary education, influenced by international agendas and commitments (King, 2005, 2009; McGrath, 2010). For example, a representative index to demonstrate the improvement of education in developing countries is the primary school enrolment rate. This approach to education in developing countries have been criticized for neglecting multiple other dimensions of education (Alexander, 2008). The existing literature on developing country education development rarely discuss how education can contribute to persisting inequalities in these contexts.

Therefore, this dissertation aims at exploring the educational inequality in developing countries. More specifically, this study explores how academic achievement is predicted by family SES through *perseverance*, a well-known non-cognitive skill. Non-cognitive skills, also known as *soft skills* or *socio-*

emotional skills have received much attention to improve academic outcome since the research on grit arose in prominence (Duckworth et al., 2007). In developing countries where parents lack the economic capital, they naturally value non-cognitive skills as a crucial factor to improve their children's academic outcome (Garcia, 2018). Accordingly, research by international agencies also began to pay attention to grit as a factor to improve academic achievement in developing countries (Crawfurd, 2016).

This study compares two countries: the Philippines and Vietnam. These two countries achieved universal primary education, making educational inequality, rather than access to education, the more salient issue. In addition, these two countries have distinct educational systems especially in educational differentiation. Because educational differentiation may result in different forms of educational inequalities (Buchmann & Dalton, 2002; Buchmann & Park, 2009; Kerckhoff, 2001; Maaz et al., 2008; Turner, 1960), comparing these two countries yields interesting implications.

Based on these gaps in the existing literature, this dissertation explores how perseverance relates to educational inequalities in developing countries with different institutional contexts.

1.2 Purpose of the Study

Based on the research background, this dissertation aims to examine the role of perseverance in intergenerational transmission of inequalities in the Philippines and Vietnam. The results can give three new insights into educational inequality and non-cognitive skills in the Philippines and Vietnam.

First, this research attempts to explore the mechanism of educational inequities in the Philippines and Vietnam. The international commitment and research on international education have focused on ways to increase access to education in developing countries especially in primary education. Therefore,

previous research does not adequately explore educational inequalities in developing countries (King, 2005, 2009; McGrath, 2010). This can be problematic for middle-income countries such as the Philippines and Vietnam that have already achieved universal primary education and are more concerned with educational inequality (Mesa, 2007; Nguyen et al., 2020). Therefore, this research aims at uncovering the mechanism of educational inequalities in the Philippines and Vietnam.

Second, this research aims to expand the educational inequalities research by including the role of children's perseverance in educational inequalities. Specifically, this research focuses on perseverance as a non-cognitive skill. With recent spotlight on the impact of grit and resilience in academic achievement, there had been growing attention on non-cognitive skills. Developing non-cognitive skills in students can a strategy of parental involvement if they lack the economic capital. Therefore, the role of perseverance in preventing intergenerational transmission of inequalities in developing countries is studied in this research.

Third, the difference in institutional contexts among developing countries in relation to educational inequality is investigated. Existing literature on educational inequalities in developing countries have focused on clarifying the difference between developing and developed countries (Buchmann & Hannum, 2001). This resulted in identifying commonalities developing countries share, but this also resulted in neglect of other institutional differences. Therefore, this research demonstrates the importance of investigating the institutional contexts of developing countries through a comparative approach.

1.3 Rationale for the Study

The Philippines and Vietnam were chosen to draw implications on perseverance and educational inequalities for Asian developing countries. For

selection of countries, several criteria were used. First, both countries are in the Southeast Asian region, the only region where the inequality index for the Sustainable Development Goals (SDGs) has regressed (UN-ESCAP, 2018). And among the lower middle-income countries[1] in Southeast Asia—Cambodia, Lao PDR, Myanmar, Philippines and Vietnam—countries that have achieved universal primary education were selected (World Bank, 2022a). As this research refers to educational inequalities exceeding the accessibility of education, it is appropriate to research countries that have achieved universal primary education to focus on educational inequalities rather than access. The Philippines and Vietnam have similar economic status as lower middle-income countries with per capita gross national income (GNI) between $1,036 and $4,045 (World Bank, 2022a), and they have over 100% primary school enrolment rates[2].

Both countries are struggling to address economic inequalities. The Philippines is notorious for economic inequalities inherited from the Spanish colonial era and failed redistribution policies after decolonization (Ventura, 2016). The Gini index of the Philippines was 42.3 in 2018, where the index of over 40 of implies high economic inequality. The number improved since 2000 when the Gini index was 47.7, but inequalities remain high. Vietnam's Gini index in 2018 was 35.7, which is still high compared to the Organization for Economic Co-operation and Development (OECD) average which is around 31 (World Bank, 2022b). Moreover, horizontal inequalities between urban-rural regions and different ethnicities are extreme and getting worse (Oxfam, 2017). In addition, growing economic inequalities have been one of the social problems

[1] There is no low-income country in Southeast Asia. Therefore, lower-middle income countries are selected.

[2] The enrollment rate is calculated with the number of students over total number of population in the age group. With retentions and students older than others in the age level, over 100% enrolment rate is common.

after the Doi Moi policy in 1986 that simultaneously promoted industrialization and economic development (Sarma, Paul & Wan, 2017). In summary, both the Philippines and Vietnam are suffering with high inequalities.

On education, both countries lack educational materials and infrastructure (Nguyen et al., 2020; Trinidad, 2020). The lack is more notorious in rural and public schools than in urban and private schools (Glewwe & Patrinos, 1999; Nguyen et al., 2020; Trinidad, 2020). Teacher quality is also worrisome in both countries, and Vietnamese schools have frequently reported lack of teachers in rural regions (Nguyen et al., 2020; Trinidad, 2020). However, in the poor educational circumstances, Vietnam has achieved high academic results compared to the Philippines, Indonesia, and Thailand (Truong, Hallinger & Sanga, 2017). Researchers have tried to explain the result with cultural factors such as Confucianism in Vietnam.

These two countries have huge variations in educational differentiation, which allows comparisons on perseverance in educational inequities. Filipino schools pursue educational equality and rarely differentiate between students until the university level. Although senior high school students (grade 11, at age 17) choose their courses according to their interests, their choices do not have much impact on university entrance. The Department of Education (DepEd) is concerned that a tracking system for senior high schools may hinder further education. The DepEd report explicitly states:

> While Senior High School offers tracks and four strands within the Academic Track, SHS [Senior High School] graduates—regardless of tracks—can gain admission to Baccalaureate degree programs. Tracking students early and making them progress within the same track is not acceptable in Philippine society, college education for the social mobility of their children being a universal aspiration of Filipino parents (GOVPH, 2022a).

In contrast, Vietnam has a differentiated school system by grades. The first official selection occurs at the upper secondary level (grade 10, at age 15). Acceptance into high school is competitive, with twice as many applicants as there is space (Le & Tran, 2013). Some students who fail to study in upper secondary school enter a vocational school where they receive vocation-specific and general education. Moreover, the variation among upper secondary schools is huge. Schools for the gifted is highly competitive, accepting only 10% of entering upper secondary students, and partly guaranteeing continuation into a prestigious university (Nguyen, 2012). Also, upper secondary school rankings are highly sophisticated in each city (Tien, 2021).

To sum up, the Philippines and Vietnam both experience high inequality and have achieved universal primary education. The two countries have different institutional contexts from which the multiple dimensions on the impact of perseverance in educational inequality may be drawn.

1.4 Research Questions

This study aims to explore the role of perseverance in the intergenerational transmission of educational inequality in the Philippines and Vietnam. This research addresses the topic in two stages—the path from family SES to perseverance and the path from perseverance to academic achievement—which is illustrated in Figure 1. In addition, this study addresses theoretical and methodological issues that are frequently ignored in previous research on non-cognitive skills, specifically in research on grit. By conducting the comparative study on two countries, this study adds new insights into the existing literature on non-cognitive skills, educational inequality, and international education.

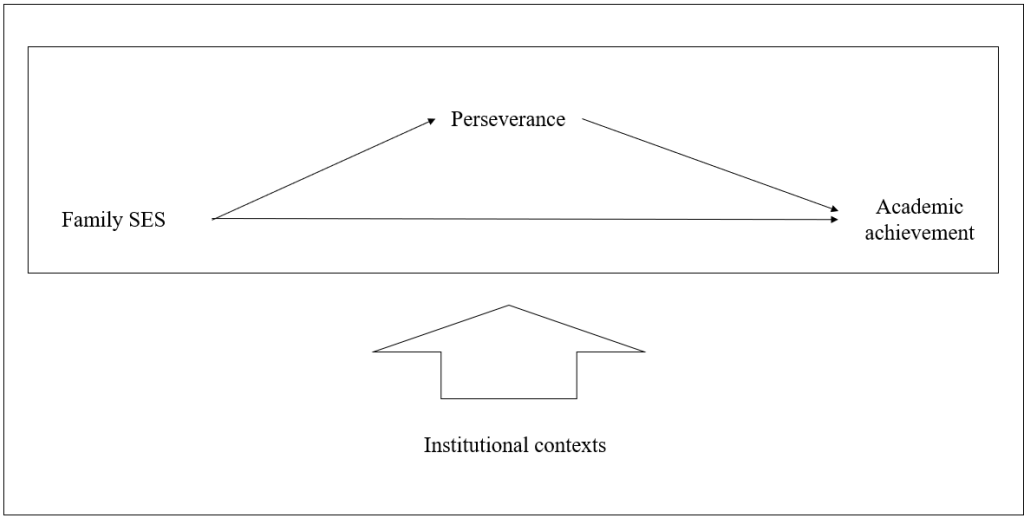

Figure 1. *Research Framework.*

Research question 1 (RQ1) investigates how perseverance is formed in the context of educational inequality in the Philippines and Vietnam. To empirically illustrate this, the association between family SES and perseverance, what I call *stratified perseverance*, is explored. Studying stratified perseverance allows me to analyze how a student's perseverance is decided by family background.

Research question 2 (RQ2) studies the *perseverance effect* in academic achievement in the Philippines and Vietnam. For analysis, the association between perseverance and academic achievement is tested, which shows how academic achievement is impacted by perseverance in two different educational contexts.

Research question 3 (RQ3) looks at the mechanism through which stratified perseverance impacts academic achievement. Although RQ1 and RQ2 addresses the effect of family SES on perseverance and the impact of perseverance on academic achievement, they do not measure the indirect effect. RQ3, therefore, explores the mechanism of stratified perseverance's effect on academic achievement.

The research questions are summarized as follows:

1) Does family SES influence perseverance in the Philippines and Vietnam?
2) Does perseverance influence academic achievement in the Philippines and Vietnam?
3) Does family SES indirectly influence academic achievement through perseverance in the Philippines and Vietnam?

1.5 Organization of Dissertation

This dissertation consists of five chapters. Chapter I was an introduction that provides the research background and rationale. A review of literature on educational inequalities revealed certain gaps which this study fills by researching the educational inequalities in the Philippines and Vietnam and the role of perseverance in differing institutional contexts. Finally, three research questions were suggested.

Chapter II presents the literature review in four sections. First, the literature on educational inequality in developing countries is reviewed to locate this research. Second, contexts of the Philippines and Vietnam and empirical research on educational inequalities in the two countries are reviewed. Third, the literature on perseverance is reviewed through the literature on grit, as they contain much information on perseverance. Finally, the literature on educational differentiation is reviewed to understand the main institutional difference between the Philippines and Vietnam.

Chapters III and IV present the research methodology and results. To conduct the analyses, two approaches are used: structural equation modeling (SEM) and fixed-effects regression, which increase the robustness of the results. Chapter V presents a summary of the findings and discusses the contributions of this research.

CHAPTER II. THEORETICAL BACKGROUND

This chapter consists of four parts: 1) research on educational inequality in developing countries, 2) contextual background of the Philippines and Vietnam, 3) literature on grit and academic achievement, and 4) educational differentiation and educational inequality. In the first part of the literature review, previous research on educational inequality in developing countries are reviewed to locate this study. In the second part, the background contexts of the Philippines and Vietnam are provided. The third part reviews the literature on grit, providing an understanding of perseverance. The literature on grit may be divided into three groups: perseverance in literature on grit, empirical research on grit and academic achievement, and sociological approaches to grit. The fourth part of the literature review pertains to educational differentiation and educational inequalities which are the focus of this study.

2.1 Research on Educational Inequalities in Developing Countries

This part explores the research context by reviewing how educational inequality in developing countries was explored in previous research. Two research areas are closely connected to this topic. The first research area is on sociology of education which is mainly concerned with educational inequality. The second research area is international education which involves the international education agenda and aid linked to education in developing countries. Therefore, this section reviews how educational inequality in developing countries was researched in these two areas, creating the setting for this research. First, the literature on sociology of education is reviewed, followed by the literature on international education.

In sociology of education, educational inequality has been a major research

topic. The concrete model of educational inequality was suggested by Blau and Duncan (1967), urging researchers to follow their suggested model on educational inequality, also known as the status attainment model (Figure 2).

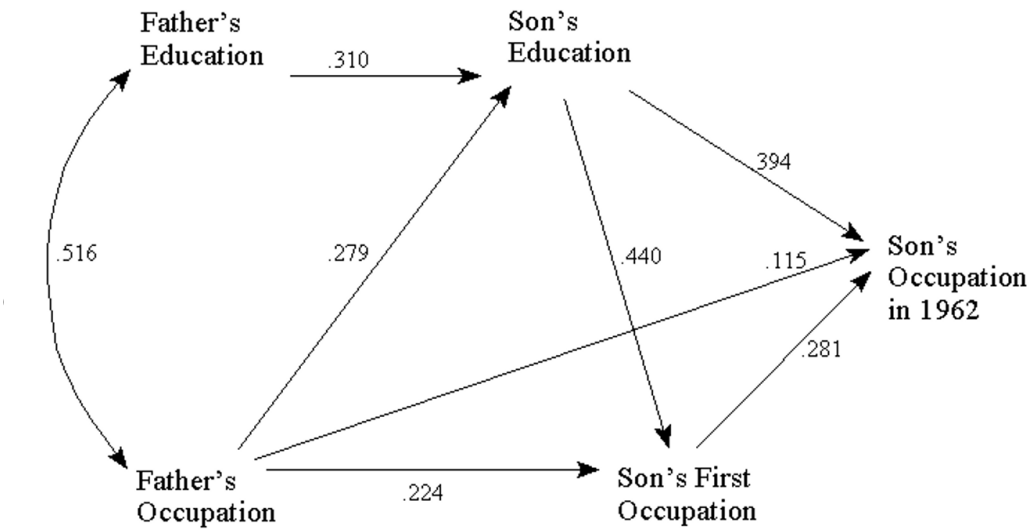

Figure 2. *Blue and Duncan's Classical Status Attainment Model (1967, p.170).*

According to the status attainment model, the son's occupation is predicted by father's occupation through son's education, implying that educational attainment contributes to persisting intergenerational inequality. The status attainment model became the foundation for empirical research on educational inequality and the basic mechanism for exploring how education may contribute to persistent inequality, addressed as educational inequality (Haller & Portes, 1973). In detail, the status attainment model is divided into two processes: one is the impact of family SES on educational attainment, and the other is the impact of children's educational attainment on their SES. Both parts have been much researched, not only in sociology of education but also in other areas such as economics. This dissertation focuses on the first part, that is, investigating how

family SES affects children's education. In detail, this research defines educational equality as the lack of statistical relationship between family SES and student's achievement, which is the predominantly used measure in the sociology and education field (Dupriez & Dumay, 2006).

Many researchers have proved empirically the family SES' effect on educational attainment in diverse country contexts (Breen & Jonsson, 2005). In addition to the degree of impact of family SES, many researchers focused on the mechanism through which family SES affect children's education. Various forms of capital are used to explain this mechanism. For example, cultural capital—suggested by Bourdieu (1986) and defined as embodying highbrow cultures—was identified as a crucial mediator of the effect of family SES on educational attainment. Cultural capital is an important mediator of family SES on children's educational attainment; high SES families tend to have flourishing cultural capital of children which increases their educational attainment (DiMaggio & Mohr, 1985; Kalmijn & Kraaykamp, 1996; Robinson & Garnier, 1985). In addition, social capital—the relationships and attachments among families, which may be extended to communities—was explored as an important mediator between parents' human capital and children's human capital (Coleman, 1988; Dika & Singh, 2002; Kim & Schneider, 2005). Parenting style was also considered by scholars. Middle-class parents are actively involved in children's schooling and extra-curricular activities, even the way they communicate with teachers, whereas labor-class parents are less involved in their children's school affairs and activities (Lareau, 2011). In summary, various mechanisms by which family SES affects children's academic achievement were suggested.

In another line of research based on the status attainment model and exploring the factors affecting educational attainment, the school effect was highlighted, comparing the level of impact of school with that of family on educational achievement. School effect research is important, as it addresses

developing countries in the sociology of education with comparative approach. Coleman et al. (1966) first discovered that in America, the impact of family SES is greater than the school effect on students' academic achievement, meaning that the equalizing role of school is inadequate. This result was shocking for many because it was believed that school would alleviate the educational inequality resulting from family background. Although this result was criticized as methodologically deficient (Baker et al., 2002; Cain & Watts, 1970), a replication of Coleman's research showed the same results in England and Wales (Peaker, 1971).

While the school effect research was shocking to society, most such studies were concentrated in Western countries, conducted in North America and Europe. At the time, scholars rarely included developing countries when researching educational inequality. But since then studies on the school effect in developing countries have emerged, showing contradicting results on school effect in Uganda and other developing countries (Heyneman, 1976; Heyneman & Loxley, 1982, 1983). According to the results, the school effect is much greater than the family effect on academic achievement in developing countries, contradicting the results from US and Europe. The difference in results can be explained by differences in country circumstances; the variation between schools in developing countries tends to be larger than that between schools in developed countries due to lack of resources and teachers, which contributes to the larger school effect.

Seeing the contrasting results, Heyneman (1976) emphasized the need for more research on educational inequality in developing countries, as it was proven that educational inequality is not always present in the same way but can differ by country. Therefore, the comparative approach began to be adopted in the field of sociology of education. Research tends to focus on making comparisons between developing and developed countries based on different

economic circumstances (Buchmann, 2011; Buchmann & Hannum, 2001; Carnoy, 2006). For example, educational policies on educational outcome, such as the voucher program in Chile and family structure in Kenya, are related differently to academic achievement than educational policies in US (Buchmann, 2000; McEwan & Carnoy, 2000). Although more research is conducted on developing countries, relatively few researches have been on a single developing country research as well as comparative research between developing countries (Buchmann & Hannum, 2001; Carnoy, 2006). Therefore, studies on educational inequality focusing on developing countries is rare.

Another research field addressing educational inequality in developing countries is international education, which is related to international and macro-structure forces (Buchmann & Hannum, 2001). International education research includes topics on improving accessibility and quality of education in developing countries, predominantly based on international commitment. As education in developing countries is highly influenced by the international education agenda, mainly led by the United Nations (UN) and the World Bank, international education research explores the international education agenda and education aid. Therefore, it is important to understand the international agenda to know how educational inequality in developing countries is outlined in the international education research area.

The most noted and influential international agenda is education for all (EFA), which was the first declaration launched at the World Conference on Education for All at Jomtien in 1990. This declaration was agreed to by diverse international agencies—the United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Development Program (UNDP), United Nations Population Fund (UNFPA), United Nations Children's Fund (UNICEF) and the World Bank—and representatives of 155 countries. Education for all became a leading agenda, the cornerstone of subsequent educational

agendas, such as the Millennium Development Goals (MDGs) and the SDGs (UNESCO, 1990). EFA includes six goals:

> Expansion of early childhood care and developmental activities, including family and community interventions, especially for poor, disadvantaged and disabled children; universal access to, and completion of, primary education by the year 2000; improvement in learning achievement such that agreed percentage of appropriate age cohort attains or surpasses a defined level of necessary learning achievement; reduction of the adult illiteracy rate to, say, one-half its 1990 level by the year 2000, with sufficient emphasis on female literacy to significantly reduce the current disparity between male and female illiteracy rates; expansion of provisions of basic education and training in other essential skills required by youth and adults, with programme effectiveness assessed in terms of behavioural changes and impacts on health, employment and productivity; increased acquisition by individuals and families of the knowledge, skills and values required for better living and sound and sustainable development, made available through all education channels including the mass media, other forms of modern and traditional communication, and social action, with effectiveness assessed in terms of behavioural change (UNESCO, 1990).

Looking at the EFA goals, a perspective from sociology of education is essentially absent (King, 2005, 2009). For example, there is no explanation for how education can be utilized for status attainment in light of the existing status of the parent, or how the school effect is greater or smaller than the family factor. Instead, EFA focuses on increasing access to education, evidenced by the frequent use of the words "*expansion"* and "*universal access"*; provision of

education and access to education are the main goals of EFA.

This approach, obsessed with educational opportunity, is based on the human capital approach to education in developing countries. The human capital theory is a main contributor to the international agenda's intense focus on educational opportunities (McCowan, 2015; McMichael, 2012). It assumes that the goal of education is to improve human productivity. Developed human capital is expected to improve national development (Brewer & McEwan, 2010). The human capital approach flourishes because economists such as Collier, Easterly, Sachs and Stiglitz, are the main actors in the international development field and education has become merely a tool (McGrath, 2010). The stream of educational policies makes scholars intent on aiding access to education rather than looking at how educational inequality exists and prevails in developing countries. In EFA goals, education is considered a subject that positively effects children and aids country development, but it is not considered that education can contribute to widening inequality. EFA goals not only impacted subsequent education goals, such as the MDGs and the SDGs, but also the trends in education research in developing countries. The focus on educational opportunities can be found in statements in the current SDGs, such as "education helps reduce inequalities" and "increasing access to education and school enrollment rates at all levels" (UN, 2022).

In conclusion, two areas of research are engaged in studies on educational inequality in developing countries: sociology of education and international education. These two research fields rarely make contact. Sociology of education is rarely concerned with developing countries except to find distinctions between developing and developed countries, while international education is concerned with educational opportunities based on the human capital approach to education.

Therefore, this research attempts to bridge the two research areas. Regarding sociology of education, comparisons are made between developing countries, not

using the binary approach involving developing and developed countries. Buchmann and Hannum (2001, p. 95) already stated that "we now know that the variability among industrialized countries and among developing countries is just as great as the variability between—and also within—them," suggesting that between-developing country research is needed. For international education research, I take the sociological perspective, away from the dominant human capital approach that prevails in international education and the international agenda. Throughout this research, between-developing country variability on educational inequality was found and the importance of the sociological perspective on education moving away from the human capital approach in developing countries was indicated.

2.2 Contextual Background of the Philippines and Vietnam

As this research aims to uncover the mechanism of educational inequalities in the Philippines and Vietnam, this part explores the educational context and previous research on these two countries. The Philippines and Vietnam are both located in Southeast Asia, sharing Southeast Asian characteristics, such as colonial experience and cultural characteristics. For example, followed by Hofstede's model of national cultures (Hofstede Insights, 2021), power distance—index showing unequal distribution of power—was high (Philippines: 94, Vietnam: 70 where 1 is the lowest and 100 is the highest). Individualism was also low in both countries (Philippines: 32, Vietnam: 20), which are characteristics that commonly found in Asian countries.

Not only do the Philippines and Vietnam share regional and cultural similarities, but both countries are on a similar economic level, as they are both lower middle-income countries according to World Bank (2022a) economic level classification (Table 1). In 2021 the Filipino GDP was $ 3,549 per capita while the GDP of Vietnam was $ 3,694 per capita. The GDP of the Philippines and

Vietnam are higher than that of Laos, Cambodia, and Myanmar but lower than the GDP of Thailand, Indonesia, Malaysia, Singapore, and Brunei (World Bank, 2022b). The populations of the two countries are also very similar. Vietnam has a population of 98 million while the Philippines has a population of 111 million (World Bank, 2022b).

When it comes to education, both countries have accomplished UPE. The Philippines accomplished UPE in the 1970s, which was early compared to other Southeast Asian countries. Vietnam had over 80% primary education completion rate in 1979 (World Bank, 2022b). In 2020, primary education completion rate was 103% in the Philippines and 110% in Vietnam. Lower secondary completion rate is high in both countries: 85.3% in the Philippines and 97.7% in Vietnam (World Bank, 2022b).

However, these two countries are different when it comes to what they pursue in their public education. Educational excellence is at the center of the Vietnamese educational system, whereas Filipino governments considers equality over educational excellence. This difference in value of education results in different educational differentiation system at secondary level. Three dimensions of educational differentiations are analyzed as follows: years of compulsory education, vocational education system, and secondary level differentiation.

Table 1. *Basic Data on Southeast Asian Countries*

	Philippines	Vietnam	Brunei Darussalam	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Singapore	Thailand
Population size	111,046,910	98,168,829	441,532	16,946,446	276,361,788	7,379,358	32,776,195	54,806,014	5,453,566	71,601,103
GDP per capita (US$)	3,548.8	3,694.0	31,722.7	1,591.0	4,291.8	2,551.3	11,371.1	1,187.2	72,794.0	7,066.2
Poverty gap at $2.15 a day	0.5	0.2	-	-	0.5	1.2	0.0	0.3	-	-
Gini index	42.3	35.7	-	-	37.9	38.8	41.1	30.7	-	35.0
Primary completion rate*	103	110	105	92	102	89	105	95	101	95
Lower secondary completion rate*	85.3	97.7	111	58.2	90.0	62.0	84.6	64.8	100.4	126.2
Upper secondary attainment rate**	30.5	31.9	63.0	9.3	38.1	62.6	62.6	22.8	74.5	35.3

Data: World Bank (2022b). All data is the most recent between 2017 and 2022. * is % of relevant age group. ** is % of population 25+.

First, the period of compulsory education is a major difference between the Philippines and Vietnam[3]. The Filipino system has a 6-4-2-4 system—6 years of elementary school, 4 years of junior high school, 2 years of senior high school, and 4 years of university—and compulsory education is 13 years, including 1 year of preschool. The current version of K-12 compulsory education was enacted in the 2013. Vietnam has 9 years of compulsory education which consists of primary (5 years) and lower secondary school (4). The entire system follows the 5-4-3-4 system adding 3 years of upper secondary school, and 4 years of university (UNESCO-IBE, 2011). Although there are concerns with shorter period of compulsory education compared to the global standard of 12 years, the Vietnamese government maintains the nine-year compulsory system (Rolleston & Iyer, 2019). Therefore, entering the limited number of upper secondary school is very difficult for young Vietnamese students who must compete in a two-to-one acceptance rate. During the 2008–2009 school year, there were 5.52 million students in lower secondary but only 2.5 million in upper secondary. Even considering that lower secondary has one more grade than upper secondary, the amount of space in upper secondary is not enough for all graduates of lower secondary (Le & Tran, 2013). Students who fail to enter an upper secondary school enter vocational upper secondary schools that provide vocation-specific subjects with general education. However, vocational schools also do not have enough capacity to accept all students who fail the academic track. Therefore, students who are unable to enter either a general upper secondary school or a vocational upper secondary school cannot continue on to further education (Le & Tran, 2013).

[3] Following each country convention, junior high school and senior high school are used for the Filipino school system, while lower secondary school and upper secondary school are used for the Vietnamese school system.

Second, the starting age and the degree of differentiation for vocational education differ in the two countries. The Philippines has an overall comprehensive educational system from elementary to senior high, without school differentiation, as can be seen in Figure 3. There are vocational and academic tracks, divided by within-school streaming at the senior high level (UNESCO-UNEVOC, 2019).

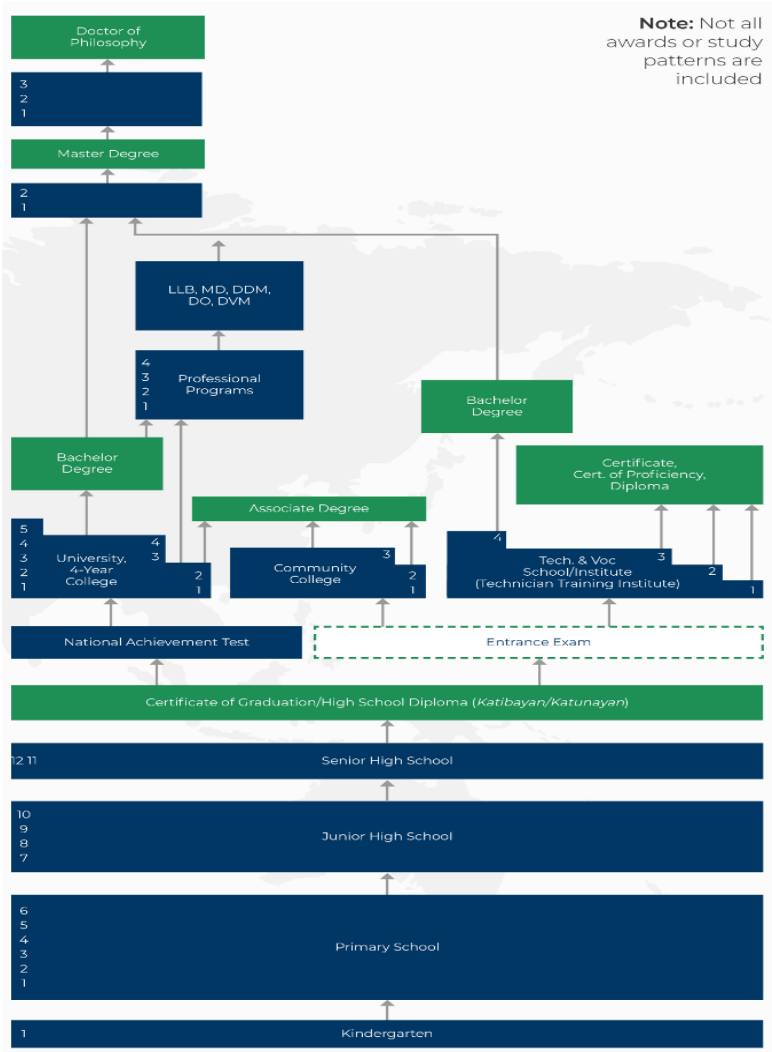

Figure 3. *Educational System in the Philippines* (WENR, 2017).

Although within-school tracking can be seen at the senior high level, this differentiation is very loose because the core modules are compulsory for all. In the last year of senior high school, students are allocated to a specialized track: academic, technical-vocational livelihood, sports, or arts (GOVPH, 2022b). The academic track comprises of 4 tracks: accountancy, business, and management (ABM); humanities and social sciences; science, technology, engineering, and mathematics; and general academic. The technical-vocational livelihood track consists of home economics, information and communication technology, agri-fishery arts, and industrial arts. However, these tracks require taking specialized subjects as well as general education. All students in senior high school, including those in the vocational track, take core courses, which are languages, literature, communication, mathematics, and philosophy (UNESCO-UNEVOC, 2019).

More importantly, the track placement in senior high school does not hinder or limit the opportunity to apply to college or other educational institutions. Senior high school graduates taking the vocational, sports, or arts track can also apply for an academic department when applying to a university. The DepEd clearly states that

> while senior high school [(SHS)] offers tracks and four strands within the Academic Track, SHS graduates—regardless of tracks—can gain admission to Baccalaureate degree programs. Tracking students early and making them progress within the same track is not acceptable in Philippine society, college education for the social mobility of their children being a universal aspiration of Filipino parents (GOVPH, 2022a).

Compared to Filipino vocational education, Vietnamese vocational education begins earlier and is firmly stratified. Students who have completed primary school may enter vocational training center (Figure 4). As lower secondary education is compulsory, the number of people directly enrolling in vocational

training at the lower secondary level is low. Vocational training at the lower secondary level is for people who drop out of lower secondary school or after lower secondary school (UNESCO-UNEVOC, 2018). Graduates of lower secondary school can enroll into professional vocational education courses which takes three to four years. Differentiation in vocational education occurs early, at the end of lower secondary level at the age of 14.

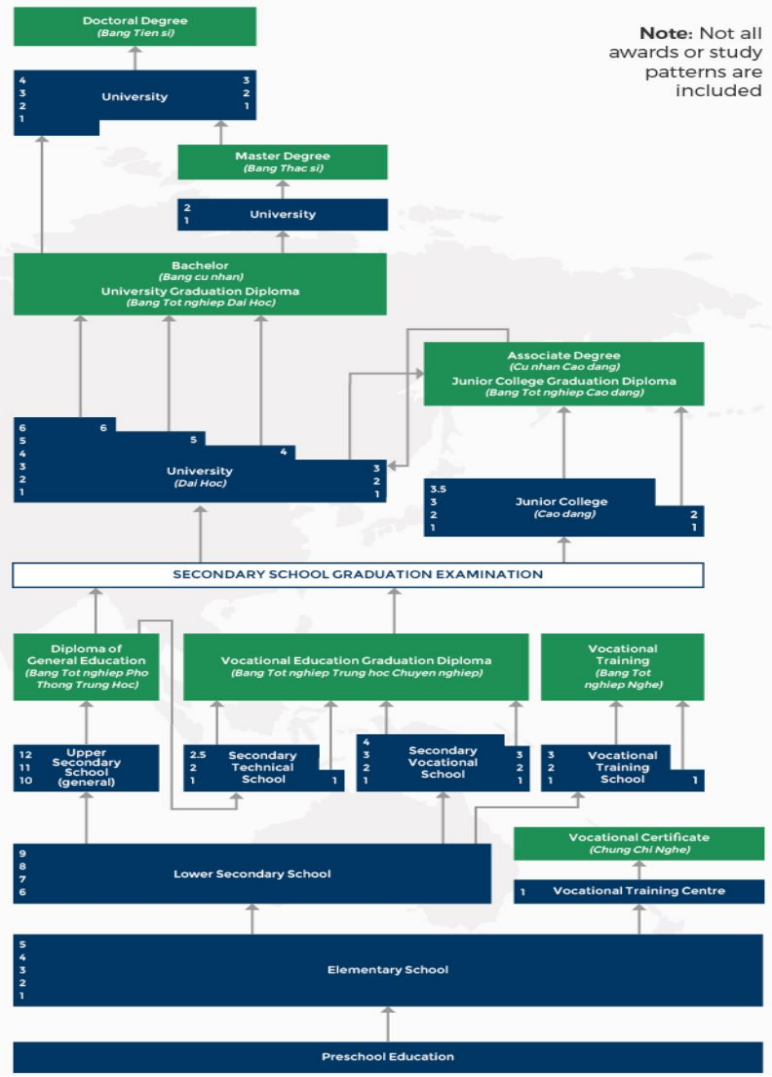

Figure 4. *Educational System in Vietnam* (WENR, 2017).

Another difference of vocational education in Vietnam compared to the Philippines is that secondary vocational school graduates cannot apply to university (UNESCO-UNEVOC, 2018). Therefore, vocational education is not preferred by the Vietnamese people. Students with low SES or little educational support tend to take the vocational track (Dang & Glewwe, 2017; Freire & Giang, 2012). The quality of vocational education is perceived to be poor, having low academic standards, poor school infrastructure, and low performance output in terms of employment (Dang & Glewwe, 2017).

Third, there are huge discrepancies between the Philippines and Vietnam in terms of school differentiation within the upper secondary level. The Philippines gives consideration to equality than excellence in its educational policies; therefore, the only form of specialized high school is science high school specializing in science and technology under the government's Department of Science and Technology. The main campus is in Quezon, on the outskirts of the capital city, Manila, and there are 15 regional campuses. Private school is one form of differentiation by school type, as 44% of all secondary schools are private in the Philippines (DepEd, 2018; PSHS, 2022). However, enrolling in private schools depends more on family SES than previous academic achievement (Yamauchi, 2005), and students are relatively free to transfer between private and public schools depending on their personal situation.

In contrasts, Vietnam has firm differentiation at upper high school level. Vietnamese education is described as one of the most competitive educational systems, especially for admission to university (UNESCO-IBE, 2007). However, universities themselves are not involved in the competitiveness of Vietnam's education, as the decision on which university a student can be admitted to is made at the upper secondary level (Dang, 2008; UNESCO-IBE, 2007; Veathika, 2017). Therefore, students strive for the upper secondary school entrance exam

not simply to enter an upper secondary school but also to study at a prestigious one (Le & Tran, 2013).

Upper secondary education for gifted students is a prestigious system in administrated by Vietnamese government policy. Article 10, of the 2006 Education Law specifies about gifted students that "the students and community shall help the poor have access to education, enabling gifted people to develop their talents" (UNESCO-IBE, 2011). Upper secondary schools for gifted students are selected in each of the 64 provinces of Vietnam, and large cities can have more than one such upper secondary school. The number of students in upper secondary school for gifted students is limited to 10% of the population of the province or city (Nguyen, 2012). Schooling for gifted students is controversial, as it causes fierce competitiveness and threatens educational equality by having 2.5 to 2.7 times more funding than other public schools (Huyen, 2020). Not only the schools for gifted students but also the ranking of Vietnamese upper secondary schools is highly sophisticatedly. MOET (Ministry of education and Training) officially announces upper secondary school rankings, followed by university entrance exam marks (Tien, 2021; VAS, 2010).

There are other, although scarce, previous research on education inequality and achievement in the Philippines and Vietnam. First, in the Philippines, the gap of years of schooling between rich and poor groups have decreased from 1960 to 2000 through mass education (Mesa, 2007). However, this does not necessarily mean educational inequalities decreased. There is still a huge discrepancy in years of schooling between urban and rural areas (Mesa, 2007; Zamora & Dorado, 2015). The results also do not take academic achievement into account. There is a considerable variation in school quality in the Philippines. Lack of school materials and resources between public and private, rural and city, and high and low SES schools affect student's learning outcome, although this between-school variance is relatively smaller than in other developing countries

(Trinidad, 2020). Private school is a contributing factor to raising educational inequality, but the increasing number of public schools is offsetting the effect of private schools (Jimenez & Sawada, 2001).

Parental involvement in the Philippines differs from those of developed countries. Filipino parents are actively involved in their children's education by providing for their basic needs, communicating consistently with them, and volunteering at schools. Filipino parents who lack the economic capital are less likely to provide extracurricular activities or private tutoring that require financial cost (Garcia, 2018). Also, it is argued that the major role of parental involvement is motivating and setting goals for their children (Jabar, 2020).

Regarding Vietnamese education research, Vietnam has high academic achievement compared to other Southeast Asian countries. Many researchers have attempted to explain this extraordinary academic result with the culture of Vietnam (Asadullah, Perera & Xiao, 2020). The Confucian culture is widely explored to explain this as Confucianism emphasizes education and perseverance for success. But side effect of the Confucian culture also shapes school atmosphere and leadership; school decision is mostly made by the principal, and teachers are constrained in terms of school leadership and management (Truong, Hallinger & Sanga, 2017).

While Vietnam is noted as a high achieving county, educational inequalities prevail. Rural regions are still under the national average on education achievement outcome. The main cause of the gap between urban and rural areas is the difference in education quality provided by teachers. Teachers avoid working in a rural area so these regions lack qualified teachers. Also, private schools that make up less than 5% of total schools are attracting students from high socioeconomic status, and are concentrated in urban areas (Glewwe & Patrinos, 1999).

Upper secondary education is a crucial factor in educational inequities in Vietnam. It is argued that upper secondary school is more accessible to students with high scores in previous levels, but minority groups have difficulty accessing upper secondary schools, mediated through low test scores and family background, indicating that upper secondary schools still have high educational inequalities (Rolleston & Iyer, 2019). Vietnamese students' non-cognitive skills are also important factors in preventing them from dropping out of lower secondary schools (Tran, 2022).

This section examined the contextual backgrounds of the Philippines and Vietnam. The Philippines and Vietnam have relatively similar backgrounds in terms of their economic development and education index. However, these two countries differ in terms of educational differentiation. Previous research illustrated that both countries are experiencing educational inequalities, but they are limited in demonstrating the existing educational gap between groups. Therefore, this dissertation explores the mechanism of educational inequality, based on two different types of educational differentiation.

2.3 Literature on Grit and Academic Achievement

The non-cognitive skills (also known as *soft skills* and *socio-emotional skills*) have been suggested as one of the important factors deciding students' academic achievement, along with cognitive skills. Various non-cognitive skills were suggested as associated with academic achievement, such as perseverance (Farrington et al., 2012), grit (Duckworth et al., 2007), self-esteem (Alves-Martins et al., 2002), conscientiousness, which is one of the five major personality constructs in psychology also called "the Big Five" (Trapmann et al., 2007), and growth mindset (Dweck, 1986).

Among these various psychological constructs, this study focuses on perseverance. This is because, first, perseverance was recently emphasized as a

non-cognitive skill associated with society having become a meritocracy (Markovits, 2019). Second, the increase in research on grit accelerated the importance of perseverance in academic achievement, as grit itself is defined as perseverance and passion for long-term goals (Duckworth et al., 2007; Duckworth & Quinn, 2009).

Therefore, this study focuses on the perseverance factor in the literature on grit. This section demonstrates the validity of perseverance as a study factor based on the review of literature on grit, analyzes empirical research on grit, then explores the discourse on grit.

2.3.1 Perseverance in Literature on Grit

In the last decade, grit has been highlighted as a crucial non-cognitive skill that determines academic achievement and professional performance. Grit is defined as "perseverance and passion for long-term goals" by Duckworth et al. (2007: 1087) is used to explain why some people achieve higher performance than others despite having the same level of intelligence and the same circumstances (Duckworth et al., 2007; Duckworth & Quinn, 2009). Individuals with more grit are more likely to succeed than those with less grit, as grittier people are more obsessed with their goals and do not give up. The concept of grit has rapidly attracted attention, not only by psychologists but also by the public worldwide. A book on grit became a New York Times bestseller, and a TED Talk on grit by Duckworth has been viewed 28 million times (Cheng, 2017; TED, 2022). Grit has become a well-known and familiar concept for people to explain success.

Grit has a two-factor structure: consistency of interests and perseverance of effort (Duckworth et al., 2007; Duckworth & Quinn, 2009). Consistency of interests means keeping a passion to achieve long-term goals rather than changing or losing interest. Perseverance of effort means sustained effort to

achieve long-term goals, even when faced with adversity. With this two-factor structure, a grit scale was developed to measure the level of grit. The original Grit-O Scale consisted of 12 self-reported questions answered on a five-point Likert scale. Later, Grit Short (Grit-S) was developed with eight items: 4 items for each factor. The statements on consistency of interests are: “I often set a goal but later choose to pursue a different one,” “New ideas and new projects sometimes distract me from previous ones,” “I have been obsessed with a certain idea or project for a short time but later lost interest,” and “I have difficulty maintaining my focus on projects that take more than a few months to complete.” The statements on perseverance of effort are: “I finish whatever I begin,” “Setbacks don’t discourage me,” “I am a hard worker,” and “I am diligent” (Duckworth & Quinn, 2009, p. 167).

For their first published journal article Duckworth et al. (2007) conducted several studies regarding grit with diverse target groups, controlling for IQ, to prove the impact of grit on performance. The studies indicated that adults with more grit tend to have higher educational qualifications; undergraduate students with more grit tend to have higher grade point averages; and grittier students at the military academy tend to be more likely to pass the intensive training program. Grit was not correlated with IQ, and grit explained performance beyond IQ and conscientiousness.

Despite the effort to conceptualize grit as a unique non-cognitive skill, the uniqueness of the grit construct has frequently been criticized. It was pointed out that conscientiousness is very similar to grit. Meta-analysis studies demonstrated high correlation between conscientiousness in the Big Five and grit, critiquing the uniqueness of grit (Credé et al., 2017). Additionally, Ponnock et al. (2020) tested the distinction between grit and conscientiousness in the Big Five and concluded that these two concepts greatly overlap. Duckworth et al. (2007) defended that grit is distinct from other similar constructs by focusing on “long-

term stamina rather than short-term intensity," as grit is a better predictor of achievement than self-control and conscientiousness in the Big Five (Duckworth et al., 2007, p. 1089).

In addition, questions were raised whether the two facets of grit are equally present. Researchers showed the difference in predictive power between the two grit components, indicating that the effect of perseverance of effort is greater than that of consistency of interest (Lam & Zhou, 2019). Other studies also showed that the perseverance component better explains academic achievement than consistency of interest (Credé et al., 2017; Ponnock et al., 2020). A study in the UK showed that only the perseverance facet is significantly related to academic achievement (Rimfeld et al., 2016). Tang et al. (2019) argued that the perseverance component is associated with the academic score even when controlling for conscientiousness, but the effect of consistency of interest is diminished when controlled for conscientiousness. Overall, the perseverance component is more related to academic results than consistency of interest.

This section reviewed the concept, the construct, and the validity of grit. Literature review showed that grit consists of two facets, perseverance of effort and consistency of interest, with the perseverance component having greater validity and impact to predict academic achievement. Based on this finding, this research concentrates on the perseverance factor rather than on the entire grit construct. Next, empirical studies on grit are analyzed.

2.3.2 Grit and Academic Achievement

Due to the focus on grit, numerous empirical studies were conducted to test the association between grit and academic achievement. In this part, the empirical research on grit, mostly conducted in Western countries, is explored, which serves to clarify this study's approach. Next, studies on grit conducted in

developing countries are analyzed including the context of the Philippines and Vietnam. Finally, comparative studies are reviewed.

Association Between Grit and Academic Achievement

To find the connection between grit and academic achievement, many studies were conducted in North America and Europe, but the results on the association between grit and academic achievements were mixed. For example, a positive relationship between academic achievement and grit was found for US high school students (Clark et al., 2020; Cosgrove et al., 2018; Eskreis-Winkler et al., 2014; Huang & Zhu, 2017), for US college students (Pate et al., 2017; Saunders-Scott et al., 2018), for Austrian high school students (Dumfart & Neubauer, 2016), for Finnish secondary students (Tang et al., 2019), and for Australian, German, and Russian higher education students (Hodge et al., 2018; Steinmayr et al., 2018; Tovar-García, 2017).

Although many studies demonstrated the positive relationship between grit and academic achievement, some studies failed to prove this relationship. Grit did not predict academic achievement for African American students studying at predominantly white schools, and SES was a better predictor for their academic achievement (Dixson et al., 2017). A study conducted in the UK showed that the impact of grit on academic achievement is minimal and that only the perseverance component is significantly related to academic achievement (Rimfeld et al., 2016). In addition, studies conducted on Canadian high school students showed that grit does not significantly affect academic achievement when controlling for previous academic scores (Bazelais et al., 2021). While many studies on the relationship between grit and academic achievement were conducted on different groups, there is no consensus of results.

Therefore, the relationship between grit and academic achievements are being questioned. One reason for mixed results on the impact of grit could be the

different control variables used by researchers (Table 2). Omitting a crucial control variable may cause a suspicious relationship, even where there is, in fact, no relationship. This problem frequently occurs in psychology, as many of them are experiment-based (Borghans et al., 2008; Hansen et al., 2004). For example, in the first study on grit conducted by Duckworth et al. (2007), intelligence was controlled for through previous test scores or IQ scores, as grit was explored based on questioning why people with the same abilities have different achievements. However, many empirical studies did not consider controlling for academic ability such as IQ (see Clark et al., 2020; Cosgrove et al., 2018), and some studies tried to control for ability by controlling for study hours (Huang & Zhu, 2017). Not only IQ but also many other control variables vary by study, suggesting the possibility of omitted variable bias. In this part, the two following necessary control variables are suggested: family SES and parental support.

Family SES and parental support are curial variables related to both academic achievement and grit, but they are frequently not considered in analysis. Previous research on sociology of education shows that SES is a significant predictor of academic achievement. Blau and Duncan (1967) suggested that children's educational achievement is closely related to family SES. In addition, some studies suggest that grit is influenced by family SES (this is discussed in more detail in Section 2.2.3). However, many studies on the association between academic achievement and grit omitted family SES as a control variable (Bazelais et al., 2021; Clark et al., 2020; Cosgrove et al., 2018; Dumfart & Neubauer, 2016; Eskreis-Winkler et al., 2014; Steinmayr et al., 2018; Strayhorn, 2014), while some studies used the SES variable (Dixson et al., 2017; Hodge et al., 2018; Huang & Zhu, 2017; Tang et al., 2019; Tovar-García, 2017).

Table 2. *List of Control Variables in Grit Research.*

Research author(s) (year)	Control variables
Bazelais et al. (2021)	Gender and previous grades
Clark et al. (2020)	Teacher support, classmate support, and parental support
Cosgrove et al. (2018)	Age, gender, race, number of advanced classes, BMI, PACER, and number of absences
Dixson et al. (2017)	Age, gender, SES, race, and a growth mindset
Dumfart and Neubauer (2016)	Age, gender, IQ, the Big Five, self-discipline, grit, self-efficacy, intrinsic-extrinsic motivation, and test anxiety
Eskreis-Winkler et al. (2014)	Age, gender, Big Five, race, and educational qualification
Hodge et al. (2018)	Age, gender, health, SES (family to attend university), and health
Huang and Zhu (2017)	Gender, SES, immigration, language spoken at home, study time, class hours, and school variables
Rimfeld et al. (2016)	Big Five and twin analysis
Steinmayr et al. (2018)	Prior grades, extraversion, neuroticism, openness, agreeableness, conscientiousness, expectancies of success, self-efficacy, values, behavioral engagement, and behavioral disaffection
Tang et al. (2019)	Gender, SES, conscientiousness, academic persistence, previous grade point average, and engagement
Tovar-García (2017)	Gender, SES, school quality, migration, health, and having peers to study with

Parental support is another variable that is easily omitted in studies related to grit and academic achievement. In their book, Duckworth (2016) emphasizes parental emotional support as one way to improve grit, and a supportive and demanding parenting style increases children's grit. Empirical studies demonstrate the impact of parental support on perseverance of effort but not on consistency of interests (Clark et al., 2020). In addition, parental support is a key variable in children's academic achievement. The problem is that parental

support is also a crucial variable affecting grit, which means that not controlling for parental support can lead to omitted variable bias (Boonk et al., 2018; Fan & Chen, 2001; Hill & Tyson, 2009; Ugwuanyi, 2020).

Grit Studies in Developing Countries

Most of the studies on grit concentrated on Western and developed countries, while research in developing countries is very limited. Developing country context is very different from Western and developed countries, and warrants separate studies. In this part, first, some studies conducted in South Africa and China are reviewed, followed by studies on grit in the Philippines and Vietnam.

In South Africa, two studies on grit were conducted, focusing on resilient students. Wills and Hofmeyr (2019) conducted studies in rural South African elementary schools to identify students who attain high academic achievement even with low family SES as being the most resilient. Results show that perseverance is a significant factor in becoming a resilient student when controlling for other factors. Hofmeyr (2021) also conducted studies in South African schools. They researched how school quality moderates the relationship between grit and academic achievement. The results showed that the perseverance subscale of grit significantly affects student reading score and that school quality interacts with this impact. The moderating effect of school quality was not uniform across students and their achievement; they varied depending on the degree of student perseverance.

He et al. (2021) conducted a study in a rural China province. They discovered that, in Chinese cities, grit does not uniformly affect academic achievement but is moderated by individual IQ. Grit is positively related to average and above average IQ but not to low IQ.

In the Philippines, a grit validity study was conducted (Datu et al., 2016a). This study was conducted on 220 university students and 606 high school

students to validate the Grit-S scale. Only the perseverance of effort component loaded on the higher-order grit factor, and consistency of interests did not load on the second order of grit. Furthermore, the perseverance facet of grit was found to predict other psychological factors, such as life satisfaction and academic engagement. Other studies show similar results (Datu et al., 2016b), with behavioral engagement and emotional engagement being positively related to the perseverance facet and consistency of interests being negatively related.

To my knowledge, no studies have been conducted with data on grit and academic achievement from Vietnam. The closest was a comparative study exploring the relationship between grit and lifelong learning participation and income in Yunnan in China, Vietnam, Germany, and the US (Liu et al., 2019). The result on Vietnam showed that grit is not related to wage, adult education, and training participation. However, this study's results are doubtful as it used only one survey question to measure grit.

Comparative Studies

Many studies on grit are limited to a single country. The lack of comparative approaches on grit has been pointed out, as has the concern that most studies on grit were concentrated in Western countries (Kwon, 2018). However, some scholars conducted comparative studies related to grit. First, Jang (2018) conducted research on the relationship between perseverance and academic achievement across 57 countries using the PISA 2012 dataset. This study explored the link between perseverance and academic achievement within countries and summarized the general trend. Scandinavian countries such as Finland and Norway tend to have a high level of association between perseverance and student achievement. Some Asian countries tend to show low levels of association. The study provided a rare cross-national analysis of the relationship between perseverance and academic achievement, and tried to

interpret the results with cultural and institutional factors such as high-stakes testing and differentiation.

However, Jang (2018)'s study was limited to interpreting the trends on the association between perseverance and academic achievement rather than identifying the factors that cause the difference in association in each country. In addition, the study used limited covariates: age, gender, grade, family SES, and immigration status. As explained earlier, parental support is an important covariate, as it affects both grit and academic achievement.

Kwon (2018) also conducted comparative studies related to grit in four countries: US, France, Turkey, and South Korea. They demonstrated that family SES is indirectly associated with grit via sense of control in all four countries, even with different cultural backgrounds. In another chapter of their dissertation, they showed that people with higher SES tend to value grit more than their counterparts and that a sense of control is related to valuing grit in both South Korea and the US. The reasons for choosing those two countries for the research was the dominance of meritocracy in the US and the fact that hard work is considered a core value in South Korea due to the influence of Confucianism. The study used comparative approaches; however, it showed the commonalities between the countries rather than the differences. The necessary institutional context (i.e., the educational differentiation) was also omitted in this study.

Disabato et al. (2019) and Xu et al. (2021) explained the different relationship between grit and academic achievement through collectivism and individualism. Disabato et al. (2019) conducted a study across 109 countries to test grit construct validity. The results show that success is well explained by grit in individualistic countries but not in collectivist countries. In collectivist cultures—Asia and Latin America—grit is teamed up with relational goals, such as being a better parent, but not with individual performance, while individualistic cultures tend to consider grit as an individual-oriented goal, such

as becoming a high-status person in a company. Xu et al. (2021), however, suggested opposite explanations of grit based on studies conducted in Hong Kong, South Korea, Australia, New Zealand, Scotland, and the US. The study demonstrated that more positive relationships between perseverance and academic achievement are found in East Asian countries with Confucian culture that values perseverance as virtue than in Western countries.

This section reviewed the empirical research on grit. It was found that two important variables, namely, family SES and parental support, are frequently ignored, improving the methodology for this research. In the second and third sections, the literature on grit in developing countries and comparative research were reviewed. Although scarce, these studies illustrate contrasting research results in terms of how collectivist and individualistic cultures contribute to the impact of grit. Thus, culture is not enough to explain the difference in the impact of grit. Therefore, this study focuses on the omitted factor of educational differentiation which is explored in Section 2.4.

2.3.3 Sociological Approach to Grit

Grit from Sociological Perspective

Moving away from empirical studies on grit, this part explores how increased attention on grit has been discussed and interpreted. While numerous studies attempted to empirically prove the relationship between grit and academic achievement or the factors deciding grit, concerned voices raised the alarm about there being too much focus on grit impact (Tierney & Almeida, 2017). The criticism on grit was based on the characteristic of grit. When grit was first conceptualized, it was conceptualized as being a teachable trait; taught through parenting and teaching (Duckworth, 2016). For example, increasing grit was considered one of the strategies to improve academic achievement for children from low-income families (SRI International, 2018). This demonstrates

that increasing grit, as a teachable trait, became a policy to improve academic achievement.

However, scholars are concerned that emphasis on grit as a teachable trait o may ignore structural factors. Gorski (2016) called this *grit ideology*—emphasis on grit to improve academic success while ignoring or focusing less on other factors affecting academic achievement. The problem with grit ideology is that it ignores the structural issues, that is, academic achievement disparities resulting from unequal distribution of access and opportunities that underlie poverty and inequality. For example, low academic achievement can occur due to lack of financial support to buy educational tools, food, and housing. Similarly, the situation of focusing only on grit was interpreted as "responsibilisation", defined as "assigning the burden of managing one's risk in society solely with the autonomous individual rather than the state" (Tierney & Almeida, 2017, p. 98). The *responsibilisation* framework excludes the interference of society, history, institutions, and culture that is usually centered in sociocultural theories. Therefore, the role of society is diminished, and grit and individual responsibility are the only focus. The minimizing the role of society results in neglecting race, SES, age, gender, school, community, religion, and social norms in student performance, leaving only students and grit (Tierney & Almeida, 2017).

These same scholars also explain why grit ideology or responsibilisation have become dominant in contemporary society. Grit is a byproduct of globalization and neoliberalism (Tierney & Almeida, 2017). In a globalized world, countries seek to produce the national workforce through high quality private institutions providing competitive education, rather than through public education. In this setting, the concept of grit is used to minimize the role of the state, burdening the youth themselves to take responsibility for their success and failure. In contrast, Gorski (2016) insists that the grit ideology is not a recent invention but merely a new name for the deficit ideology within the myth of

meritocracy. Deficit ideology is the belief that poverty is the result of distortional and psychological deficiencies in individuals. Therefore, emphasizing grit as a reason for success can enforce the deficit ideology.

As an alternative to the grit discourse, the concept of resilience may be more appropriate to understand individual success or failure (Wilson-Strydom, 2017). Resilience considers the social contexts as well while concentrating on individual ability and grit. To explain the academic success of disadvantaged students in South Africa, the students' grit was not enough; the concept of social enablers, identified in human capability theory by Sen (1999), needed to be included. Therefore, resilience is a much more comprehensive concept than grit which omits the social context.

In summary, the discourse on grit warned about ignoring the structural factor to focus only on individual grit may blame the individual for their low performance and enforce the prevailing system of meritocracy (Gorski, 2016). This is the result of grit being researched in psychology and interpreted on the individual level rather than on the structural level (Kwon, 2018). Therefore, this research interprets grit not only from the perspective of individual psychology but also from the perspective of sociology.

Grit as Emotional Capital

As discussed, focusing on grit impact may neglect the structural context. This section attempts a sociological approach to grit and address the lack of structural considerations. For this purpose I explore the concept of emotional capital then suggest considering grit as an emotional capital.

The concept of emotional capital applied in this paper should be distinguished from the same phrase used in management and administration. Emotional capital used in management and administration means emotional techniques used to achieve the best possible production (Gendron & Gendron,

2004). Another concept that can be confusing is emotional labor. Emotional labor refers to people with less power expressing negative emotions about other people or groups. The main example of emotional labor is dealing with complaining customers (Hochschild, 2003).

The concept of emotional capital used in this research was derived from Bourdieu's cultural capital to explain the private sphere of capital, especially in the family rather than in the public sphere. Emotional capital is used to explain mothering in households, especially in terms of education of children (Allat, 1993; Reay, 2004). Emotional capital was first conceptualized by Nowotny (1981) who considered it a part of social capital as explained by Bourdieu. In the 1980s, women's educational achievement and social participation increased in Austria, but they tended to retire after marriage to become wives and mothers. Nowotny (1981) argued that the capital accumulated by women before marriage does not simply evaporate by quitting an occupation; rather, it is exchanged for emotional capital that is actively transmitted to their children. Therefore, emotional capital is possessed by women, who are the main caregivers of children, and it is private and peripheral (Nowotny, 1981).

Although emotional capital as explained by Nowotny (1981) is valuable in that it conceptualizes nurturing as a form of capital, considering that it originated in the 1980s Austria, it does not quite fit today's society. Therefore, the concept of emotional capital was extended and newly defined. Allatt (1993) insisted that emotional capital is not confined to women but that men can also transmit their emotional capital to their children. In addition, emotional capital is not only part of social capital but also exists in the dynamics of economic, social, and cultural capital (Allatt, 1993). Therefore, emotional capital can vary by class (Reay, 2000; Zembylas, 2007). Many studies demonstrated a high correlation between emotional capital and economic, cultural and social capital (O'Brien, 2008; Reay, 2000).

The most frequently mentioned emotional capital is responsibility and individualism, followed by working hard, effort and the enjoyment of success (Allatt, 1993). Also, middle-class parents actively transmit their emotional capital, consisting of support, perseverance, and participation, to their children (Reay, 2004). Emotional capital interacts with other types of capital to positively affect children's education and employment (Allatt, 1993). However, labor-class parents tend to have less academic confidence than middle-class parents, therefore, labor-class parents avoid actively transmitting their emotional capital related to education to their children. In addition, labor-class parents rarely have a positive view on public education, making them transmit negative feelings on education to their children.

In summary, in reviewing the literature it was found that the growing grit discourse has been problematized. Only teachable characteristics of grit—through parenting and extra activity—were emphasized, whereas the importance of the social structure for forming grit was rarely acknowledged (Duckworth, 2016; Kwon, 2018). This section also reviewed the concept of emotional capital; parents with high SES tend to have a high level of emotional capital, which is transmitted to their children. Based on the theory of emotional capital, this dissertation suggests that perseverance is an important component of emotional capital, mediating between family SES and children's academic achievement.

2.4 Educational Differentiation and Educational Inequalities

Educational differentiation is one of the main research topics in sociology of education, as educational differentiation is deeply related to educational inequality (Chmielewski et al., 2013; Kerckhoff, 2001; Turner, 1960). Therefore, in this part, the concept of educational differentiation is explored, followed by how educational differentiation is related to educational inequality and non-cognitive skills.

2.4.1 Educational Differentiation

The concept of educational differentiation was first theorized by Turner (1960). They identified contest mobility in the US educational system and sponsored mobility in the English educational system to show educational differentiation. Contest mobility means that competitions for high status positions are open to all people and can be participated by anyone, regardless of their previous achievements, and can be achieved using only their own effort and motivation. In contrast, a sponsored mobility system means that a sponsor is necessary to become part of the elite because elite sponsors judge and decide whether a candidate is eligible to be their fellow. In education systems, these characteristics of contest and sponsored mobility were applied in the selection of students in secondary school. In the US, the quality gap between secondary schools was narrow. In contrast, the English secondary school system was segregated in the 1960s by sorting at an early age. Therefore, English students needed to enter specific grammar schools to study at university, with no second chance, but American students could study at university after any kind of high school. Although Turner (1960) broadly described educational differentiation, they saw early sorting as key for differentiation through a selection process.

Following Turner (1960), Kerckhoff (2001) suggested three characteristics to describe educational differentiation. They stressed not only the importance of the relationship between social stratification and education but also considered variation between institutions, stating that “not all ‘sorting machines’ work in the same way” (Kerckhoff, 2001, p. 4). They emphasized that educational differentiation may appear in different forms in societies. Kerckhoff (2001) suggested three dimensions of educational differentiation: stratification, standardization, and vocational specificity. Stratification indicates how the degree of differentiation is vertically aligned from superior to inferior. Standardization refers to nationwide homogeneity in curricula and quality of

education. Vocational specificity refers to the varying degrees of vocation-specific curricula. Although Kerckhoff (2001) suggested three dimensions of differentiation, they are not independent but overlap. For example, vocational specificity is one of the crucial elements of school stratification in America (Gamoran, 1987; Lucas, 2001).

Differentiation in education manifests in various forms. Chmielewski et al. (2013) categorizes educational differentiation seen in the real world: between-school streaming, within-school steaming, and course-by-course streaming. Between-school streaming is the most rigid form of differentiation where students enter a different school based on their previous achievements. Within-school streaming means that students are assigned different tracks in the same school, according to their ability. Course-by course tracking means that students are grouped by their ability for only certain subjects.

Overall, educational differentiation is not simple and is not defined by one standard, but has various dimensions such as stratification, standardization, and vocational specificity and between-school streaming, within-school steaming, and course-by-course streaming. That is why quantifying educational differentiation is difficult. While many studies tried to focus on specific characteristics (Bodovski et al., 2017), some researchers used binary categories, located in opposite parts of the educational differentiation (Buchmann & Hannum, 2001; Park, 2008). In sum, quantifying educational differentiation results in focusing only on certain characteristics of educational differentiation, making it difficult to show quantifiable difference. This is why this research uses the comparison of two different counties rather than quantifying educational differentiation.

2.4.2 Educational Differentiation and Inequalities

Educational differentiation has been discussed as being closely linked to educational inequality (Buchmann & Dalton, 2002; Buchmann & Park, 2009; Kerckhoff, 2001; Maaz et al., 2008; Turner, 1960). This is because educational differentiation not only implies the provision of different levels of educational quality but also intergenerational privilege (Buchmann & Park, 2009; Gruijters & Behrman, 2020). As shown in Section 2.4.1., educational differentiation has various forms. In this section, educational differentiation's relationship with educational inequality is explored in the context of different countries.

Although globally, educational differentiation is found in different forms, central European countries frequently present a highly differentiated educational system. For example, the selection of students in Germany, Austria, Czech Republic, Hungary, and the Netherlands occurs from the ages of 10 to 12 for vocational, academic, or comprehensive secondary school (Buchmann & Park, 2009). Family SES is influential in children's track placement; children with high SES parents tend to study at academic schools, while children with low family SES tend to study at technical and vocational schools (Buchmann & Park, 2009; Maaz et al., 2008). After tracking, family SES no longer impacts students' occupational expectations, but the type of school still makes a difference. The type of school students end up attending is a crucial factor in educational inequality mechanism in countries with highly differentiated educational systems (Buchmann & Park, 2009).

Not only in central Europe but also in Africa is educational differentiation accelerated through low-fee private education. The low-fee private school has been a form of differentiation from the public school since the late 1990s and early 2000s in Africa (Gruijters et al., 2020; Srivastava, 2013). While the enrolment rate in primary education has increased dramatically with international commitments such as UPE, the quality of education has not improved and may

even have decreased due to a lack of educational and human resource. In this setting, low-fee private schools have become popular for middle-class parents who want a good education for their children. Private schools fully mediate the impact of family SES on students' academic achievement in Francophone Africa (Gruijters & Behrman, 2020). In other words, children from high SES families tend to have high academic outcomes through private school education.

The US does not have such school differentiation but has within-school tracking in high school. US education system is recognized as comprehensive because students are not selected at the secondary level. But students are subject to within-school stratification by their vocational or academic track, which is a form of within-school streaming that Chmielewski et al. (2013) explored. The within-school track system contributes to educational inequality. Lucas's (2001) study showed how track placement has replacing the educational inequalities occurred by the years of schooling. Before mass education became popular, educational inequality was inherited based on years of schooling. But, today track placement became the more salient factor contributing to educational inequalities. They insisted that within-school differentiation has become more crucial than years of schooling among the secondary school-age population. This means that not only educational qualification but also quality of education is a crucial factor to research in the area of educational inequality.

In many Asian countries, educational differentiation begins at the upper secondary level. For example, Taiwan has a stratified school system with a vocational and an academic track in high school, and more than 80% of students in the vocational track enter tertiary education. Secondary school in Taiwan is fiercely ranked and stratified by student achievement (Choi, 2015). Korea also had a stratified secondary school system before the mid-1970s an equalization policy was implemented; academic high school students can study at prestigious universities, while vocational school students rarely receive a second chance to

study at prestigious universities but can enter university (Seth, 2002). Indonesian high schools are also stratified in sophisticated rankings, where prestigious high schools improve the possibility of higher education.

Some scholars conducted cross-national comparative research on differentiation and educational inequality. Bodovski et al. (2017) demonstrated that the national mean of math achievement is more likely to be higher in countries with a highly standardized educational system that determines the handling of national curricula, textbooks and evaluations, compared to countries with a less standardized educational system. In addition, they discovered differentiation and standardization as the moderating effect on math achievement, and that a standardized education system can remedy the negative effect of differentiation. This implies that educational stratification and differentiation are related to academic achievement and that educational differentiation is not the sole factor in educational achievement.

Furthermore, Park's (2008) study showed how the effect of parenting differs depending on the degree of national standardization of the educational system, that is, national curricula, nationally decided textbooks and national exams. Seven countries with highly standardized education systems and seven countries without such a system were selected through research and consultation. In countries with high educational standardization, the impact of parent–child communication on academic achievement is greater for students with low family SES than for students with high family SES. However, in countries with non-standardized educational systems, the impact of parent–child communication was greater for students with high family SES, which means that communication with parents is more beneficial for students from families with high SES. Although this was a study on the standardization of education systems, it concluded that the effect of parent–child communication is maximized for students with low family SES in highly standardized educational systems.

In sum, there are diverse forms of educational differentiation. A country's context should be taken into consideration to understand the educational differentiation in that country. Furthermore, educational differentiation is related to educational inequality. Especially in countries with highly differentiated school systems, schools mediate the effect of family SES, meaning that schools are channels for intergenerational inequality. Based on these findings, this research focuses on educational differentiation to uncover the inequality mechanism in the Philippines and Vietnam.

2.4.3 Stratified Perseverance and Academic Achievement in Countries with Different Degrees of Educational Differentiation

This section explores the literature on educational differentiation, non-cognitive skills, and academic achievement. To understand the reason behind the mediating role of perseverance in transmitting inequality, the influence of family SES on perseverance is explored first, followed by the influence of perseverance on academic achievement.

First, it can be assumed that the influence of family SES on perseverance differs to the extent of educational differentiation. Several studies supported the impact of perseverance on academic achievement. The perseverance dimension of grit is influenced by family in the US and South Korea (Kwon, 2018). Similarly, growth mindset—a psychological construct that is strongly related to grit—is strongly predicted by family SES based on Chilean national data, explaining that "structural inequalities can give rise to psychological inequalities and that those psychological inequalities can reinforce the impact of structural inequalities on achievement and future opportunities" (Claro et al., 2016, p. 8867). These empirical studies imply that there is a possibility that perseverance is predicted by family SES.

However, these studies hardly explain the disparity in the degree of effect of family SES on non-cognitive skills. Kwon (2018) recognized the difference in the impact of family SES on perseverance and pointed to Confucian culture—diligence as virtue—as a possible factor that differentiates the impact of family SES in Korea and the US. However, this cannot fully explain the difference between Korea and the US.

Therefore, I considered the characteristic of educational differentiation to moderate the effect of parental involvement on students' non-cognitive skills. Buchmann and Dalton (2002) suggested that educational and occupational expectations are differently influenced by parents and peers within the scope of educational differentiation. Students in a highly differentiated educational system—experiencing extreme differentiation from an early age—tend to not easily be influenced by peers' and parents' attitudes on academic achievement and occupational aspirations. Sorting at an early age makes students determine their aspirations and goals at that age, leaving little room for intervention by parents and peers. In contrast, students in countries with less differentiated educational systems are more likely to be influenced by peers' and parents' attitudes on their educational expectations.

In a similar vein, Buchmann and Park (2009) demonstrated that the effect of parental SES on further educational and occupational expectations is not significant but that the type of school is a significant factor in educational and occupational expectations in countries with high educational differentiation, such as Austria, Czech Republic, Germany, Hungary, and the Netherlands.

These studies helped to postulate the relationship between family SES and perseverance in various differentiations of educational systems. Based on previous study, it can be assumed that parental influence would be low in countries with highly differentiated education systems, as the opportunity for interference by parents is minimized. Instead, family SES influence is significant

when it comes to tracks or school choice. In contrast, students in countries with low differentiated educations are more likely to be influenced by parents on their non-cognitive skills. Therefore, it is hypothesized that the effect of family SES on the perseverance of students would be greater in the Philippines than in Vietnam.

In terms of the impact of perseverance on academic achievement, it is an actively researched topic in educational psychology but with mixed results. In fact, the impact of grit differs by country (Jang, 2018), but it is still scarcely understood which factor causes the difference in the impact of grit. There have been several attempts to explain the variation through cultural differences, however, they do not fully explain the difference. Jang (2018) concludes that the perseverance impact differs by continent and country, while others describe that collectivism and individualism are factors that can explain the difference in impact of perseverance on academic achievement. However, the results about collectivism are contradictory. Disabato et al. (2019) insist that the impact of grit on academic achievement is positive in individualistic countries where individual success is virtue, while Xu et al. (2021) found a positive impact in collectivist countries, explaining that East Asian culture put perseverance at the center of virtue, influenced by Confucianism. Therefore, this research attempts to adopt institutional difference to explain the difference in the impact of grit in countries.

To explain the different effects of perseverance on academic achievement, the education institutional context, such as educational differentiation, was utilized. Nunn (2014) demonstrated that students in American elite schools tend to believe that excellence results from effort, while students in comprehensive schools believe that intelligence is fixed in a set parameter. In a similar vein, Mijs (2016) researched how students attribute their academic success and failure. They discovered that students in stratified school systems with academic and vocational tracking tend to attribute their academic success or failure to their

merit as they grow up in homogeneous groups (i.e. similar SES) and have rare opportunities to know heterogenous groups of students, whereas students in comprehensive schools tend to attribute their academic performance to teachers and luck because it is easier for students in comprehensive education systems to know how they have been awarded of advantage or disadvantage in term of learning environment compared to their counterparts by meeting them in schools and class. Although these two studies explain that educational differentiation is related to their attributions of academic achievement, they cannot explain how perseverance effect can be differentiated.

Trautwein et al. (2006) conducted research on the relationship between self-esteem and academic achievement in different learning environments. They compared two different educational systems: the comprehensive school system in East Germany and the ego-protective learning system with early tracking in West Germany before unification. The results indicated that the East German comprehensive system tends to foster student competence, resulting in self-esteem greatly impacting academic achievement. In contrast, for students in a West German system, especially those who have already been allocated their track and whose future educational expectations have already been decided, the impact of self-esteem was not significant on their academic achievement. This can be connected to previous research that showed that students in a highly differentiated educational system are more realistic about their education because they know their current achievement (Buchmann and Park, 2009). Therefore, it is hypothesized that the effect of perseverance on academic achievement is greater in the Philippines, which has a less differentiated educational system, than in Vietnam, which has a highly differentiated educational system.

CHAPTER III. METHODOLOGY

3.1 Research Design

This study concerns the role of perseverance in the process of educational inequality in the Philippines and Vietnam. Perseverance is identified as an important capital in developing countries that lack economic resource. Although the Philippines and Vietnam achieved UPE and have similar economic level, they are polar opposite in educational differentiation. The Filipino school system rarely selects students before university level. Although senior high school students choose their courses by their interest in prospective topics of study at university in the future, their choice of track is virtually unrelated to university entrance. Furthermore, the DepEd is concerned with the possibility that the track system at senior high school may hinder further educational choice. In contrast, Vietnam has a stratified school system. The first serious selection occurs at the upper secondary level. Admission to upper secondary is competitive, and students who fail to study in upper secondary school enter vocational school, which provides vocation-specific and general education. Variation among academic upper secondary schools is great; school ranking is highly sophisticated, with a system of gifted high schools.

Regarding RQ1—the effect of family SES on perseverance—, I established a hypothesis for each country based on the literature review and trends in educational differentiation. Previous literature illustrated that expected educational and occupational qualifications are greatly influenced by family SES in countries with comprehensive education, while the impact is lower in countries with highly differentiated educational systems. Therefore, I established the hypothesis that stratified perseverance would be stronger in the Philippines than in Vietnam.

RQ2 was meant to test the effect of perseverance on academic achievement.

Studies on the effect of perseverance were conducted in many different countries, presenting mixed results. The literature implied that non-cognitive skills greatly impact academic achievement in countries with a comprehensive educational system and that the impact is diminished in countries with a highly differentiated educational system. I hypothesized that the impact of perseverance would be larger in the Philippines than in Vietnam.

RQ3 was established based on RQ1 and RQ2 to test the mediating role of grit in educational inequality. Based on the hypotheses on RQ1 and RQ2, I hypothesized that the mediating role of perseverance would be found in countries with a comprehensive educational system and not found in countries with a highly differentiated system. Therefore, I expected that the mediation effect of family SES on academic achievement via perseverance would be found in the Philippines but not, or less, in Vietnam.

I also considered control variables to address the selection effect. Gender, and grade is associated with non-cognitive skills and academic achievement (Cosgrove et al., 2018; Eskreis-Winkler et al., 2014). Grade repetition and late school entrance is common in developing countries and are related to family SES and academic achievement (Daniels & Adair, 2004). Also, parental support and previous academic achievement is related to family SES, perseverance and academic achievement (Bazelais et al., 2021; Steinmayr et al., 2018). Therefore, the research model is identified as Figure 5, and analysis conducted for each country to compare.

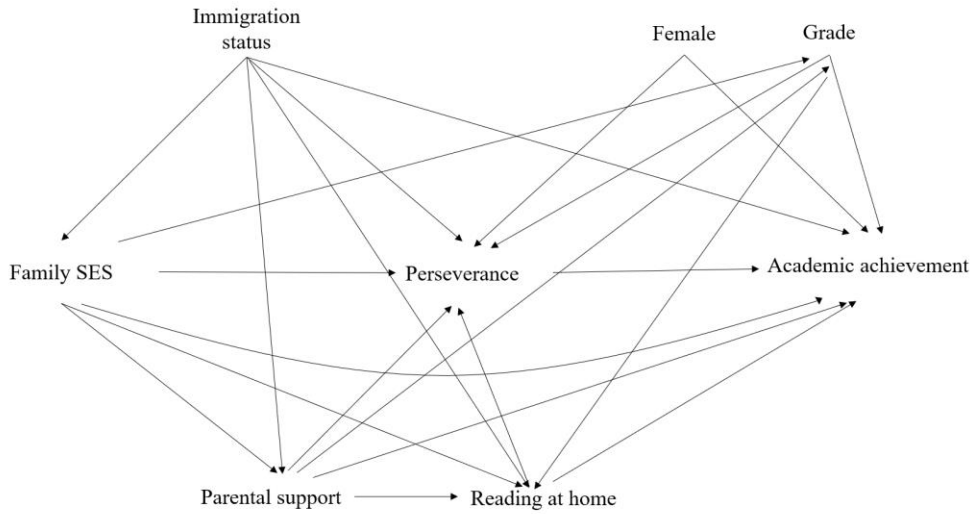

Figure 5. *Research Model.*

3.2 Data

The data used in this research are from the PISA 2018 database. The program was implemented by the OECD to assess 15-year-old students' academic competence every three years since 2000 (OECD, 2019a). Therefore, PISA 2018 is the 7th PISA survey. The program primarily assesses student knowledge and skills in three categories: reading, mathematics, and science. Achievements in other subjects are also assessed; PISA adds one additional competency each year. For example, financial literacy was tested in 2012 and 2015, and global competence was assessed in 2018 (OECD, 2017).

The program not only assesses competency but also collects information on participating students worldwide. Extensive information is gathered by asking about family and school background, educational environment, education motivation, and career inspection (OECD, 2017, 2019b). In addition, the PISA survey contains specialized questions for each year, for example, student's socio-emotional competency was assessed in 2018 (OECD, 2016). The technical report by PISA recommends that research be conducted on differences and relationships

related to student and school factors using contextual information and student competence across countries (OECD, 2017, 2019b).

The number of countries participating in PISA has increased, and participation by non-OECD countries has expanded. In 2000, 32 countries participated in PISA, which increased to 79 in 2018. The Philippines first participated in PISA in 2018 (OECD, 2019b). Data collected by PISA are widely used for research, especially in comparative studies, not only in OECD countries but also in non-OECD countries.

For this study, the datasets on Vietnam and the Philippines were used. The number of students' data are n = 7,233 (the Philippines) and n = 5,377 (Vietnam), and the school samples are n =187 (the Philippines), and n =151 (Vietnam). All the samples were included for analysis without deletion.

3.3 Measures

3.3.1 Dependent Variables

In this research, the dependent variables were reading, math, and science, that is, the academic achievement of 15-year-old students based on PISA 2018 results. The PISA 2018 data provided 10 plausible values that were based on the item response theory, with a mean (M) of 500 and a standard deviation (SD) of 100 (OECD, 2016, 2019b). In this study, the first plausible value from each subject was used. This method was adopted because previous research showed that there was little difference between using all plausible variables and one plausible value (Byun et al., 2012; Hampden-Thompson & Pong, 2005; Martin & Kelly, 1988)[4]. The definitions of the literacy subjects are listed below (OECD, 2016).

[4] However, I also conducted analysis with all ten plausible variables for each subject for the robustness using the *pv* option, Stata 17, which is included in Appendix A.

- ✓ *Reading literacy*: An individual's capacity to understand, use, evaluate, reflect on, and engage with texts in order to achieve one's goals, develop one's knowledge and potential, and participate in society.
- ✓ *Mathematical literacy*: An individual's capacity to formulate, employ, and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using PISA mathematical concepts, procedures, facts, and tools to describe, explain, and predict phenomena.
- ✓ *Scientific literacy*: The ability to engage with science-related issues, and with the ideas of science, as a reflective citizen. A scientifically literate person is willing to engage in reasoned discourse about science and technology, which requires the competencies to explain phenomena scientifically, evaluate and design scientific enquiry, and interpret data and evidence scientifically.

3.3.2 Mediator

Although the PISA 2018 data did not include perseverance questions as suggested by Duckworth (2016), it included questions related to student perseverance. Looking at the PISA 2018 framework, perseverance factors were measured as one of the achievement motives because of much attention from the public and in the literature discussing perseverance as a crucial predictor of academic achievement. In addition, measured perseverance in PISA 2018 is strongly related to grit, stating that "many different labels are used in the current literature for this construct, including 'persistence' and 'grit'" (OECD, 2016, p. 108). I selected questions from PISA 2018 related to perseverance on the Grit-S scale (Table 3).

Table 3. *Comparison Between the Grit-S and the PISA 2018 questionnaire.*

Grit: Perseverance of effort	PISA 2018
I finish whatever I begin.	- Once I start a task, I persist until it is finished (task persistence). - I usually manage one way or another (managing tasks).
Setbacks don't discourage me.	- My belief in myself gets me through hard times (overcoming hard times). - When I'm in a difficult situation, I can usually find my way out of it (handling difficult situations).
I am a hard worker.	- I find satisfaction in working as hard as I can (working hard).
I am diligent.	- If I am not good at something, I would rather keep struggling to master it than move on to something I may be good at (struggling to master).

For the six perseverance-related questions, students were asked to indicate to the extent to which they agree or disagree on a four-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree).

For the SEM analysis, the analysis of all six questions was included as an indicator of a perseverance latent variable. For the OLS analysis, perseverance standardized composite scores (M = 0, SD = 1) were predicted through principal component factor analysis with answers to six questions (Table 4). The composite variables were predicted within country, taking into consideration the variation between the two countries.

Table 4. *Factor Loadings for Perseverance.*

Items		Philippines		Vietnam	
		Factor 1 (*perseverance*)	Cronbach Alpha	Factor 1 (*perseverance*)	Cronbach Alpha
Working hard		0.75		0.62	
Task persistence		0.74		0.69	
Struggling to master		0.66		0.53	
Managing tasks		0.68	0.78	0.47	0.61
Overcoming hard times		0.65		0.65	
Handling difficult situations		0.67		0.54	
Eigenvalue			2.88		2.07
KMO			0.81		0.72
Bartlett test of sphericity	Chi-square		10026.756		2983.494
	df(p)		15(0.000)		15(0.000)

Data and Sample: PISA 2018. The Philippines' student *n* = 7,233; Vietnam's student n = 5,377.

3.3.3 Independent Variable

Family SES. In this study, the independents variable is family SES, which is supposed to affect academic achievement through the variable of perseverance. The PISA 2018 dataset provided an index of economic, social, and cultural status (ESCS), consisting of (1) the index of the highest educational level of parents (PARED), (2) the highest occupational status of parents (HISEI), and (3) the summary index of all household possessions (HOMEPOS). However, the problem with ESCS is the proxy of international difference, as it is standardized for all countries participating in PISA (Byun et al., 2012; Park, 2008). Therefore, this study did not use the ESCS variable but used the three indices, that is, PARED, HISEI, and HOMEPOS. For the SEM analysis, all three indices were included as indicators for the latent family SES variable. For the OLS analysis,

the family SES variable was predicted by PARED, HISEI, and HOMEPOS for each country. To predict a standardized family SES variable within each country—the Philippines and Vietnam—principal component factor analysis of the three indices was performed (Table 5).

Table 5. *Factor Loadings for SES.*

		Philippines		Vietnam	
Items		Factor 1 (*SES*)	Cronbach Alpha	Factor 1 (*SES*)	Cronbach Alpha
PARED		0.68		0.80	
HISEI		0.77	0.62	0.80	0.72
HOMEPOS		0.81		0.80	
Eigenvalue			1.70		1.92
KMO			0.62		0.68
Bartlett test of sphericity	Chi-square		2415.91		2886.03
	df(p)		3(0.000)		3(0.000)

Data and Sample: PISA 2018. The Philippines' student *n* = 7,233; Vietnam's student n = 5,377.

3.3.4 Control Variables

Parental Support. PISA 2018 asked respondents three questions about parental support on student education and emotions answerable on a four-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree): (a) my parents support my educational effort and achievements, (b) my parents support me when I am facing difficulties at school, and (c) my parents encourage me to be confident. For the OLS analysis, principal component analysis was conducted to obtain a standardized parental support variable within each country using these three questions. The details of the factor analysis can be seen in Table 6.

Table 6. *Factor Loadings for Parental Support.*

		Philippines		Vietnam	
Items		Factor 1 (Parental support)	Cronbach Alpha	Factor 1 (Parental support)	Cronbach Alpha
My parents support my educational effort and achievements.		0.92		0.87	
My parents support me when I am facing difficulties at school.		0.92	0.91	0.89	0.86
My parents encourage me to be confident.		0.92		0.89	
Eigenvalue			2.54		2.34
KMO			0.758		0.733
Bartlett test of sphericity	Chi-square		13140.51		7308.270
	df(p)		3(0.000)		3(0.000)

Data and Sample: PISA 2018. The Philippines' student *n* = 7,233; Vietnam's student n = 5,377.

Gender. In terms of gender, female students were coded 1, and male students were coded 0.

Grade. The PISA survey targeted 15-year-old students. Therefore, a control grade was needed. In the Philippines' sample, the grades varied from grade 7 to grade 12. Grades 11 (0.41% of the Filipino sample) and 12 (0.04% of the Filipino sample) were outliers, therefore, they were changed to grade 10. Regarding the Vietnamese sample, grades 7 (0.2% of the Vietnamese sample) and 8 (0.69% of the Vietnamese sample) were changed to grade 9, and grade 11 (0.02% of the Vietnamese sample) was changed to grade 10.

Immigration Status. Students with an immigration background were coded 1, and the non-immigrant students were coded 0.

Reading Hours. In the PISA 2018 survey, students were asked to answer the question, "About how much time do you usually spend reading for enjoyment?" Students were asked to pick one of five answers: I do not read for enjoyment (=0), 30 minutes or less a day (=0.5), more than 3 minutes to less than 60 minutes a day (=1), 1 to 2 hours a day (=2), or more than 2 hours a day (=3). This variable was answered categorically, but used in analysis as continuous followed by the meaning of the responded meaning.

Table 7. *Program for International Student Assessment's Variables' Names and Coding Schemes.*

Variable	2018 Program for International Student Assessment Data Sources	
	Name	Coding scheme
Reading scores	PV01READ	Continuous
Math scores	PV01MATH	Continuous
Science scores	PV01SCIE	Continuous
Perseverance	ST182Q03HA ST182Q04HA ST182Q06HA ST188Q01HA ST188Q06HA ST188Q07HA	Continuous; the index was standardized based on six questions about perseverance within each country.
Family SES	HISEI, PARED, HOMEPOS	Continuous; the index was standardized based on three indices concerning the highest educational level of parents (PARED), the highest occupational status of parents (HISEI), and the summary index of all household possessions (HOMEPOS).
Parental support	ST123Q02NA ST123Q03NA ST123Q04NA	Continuous; the index was standardized based on three questions about parental support within each country.
Female	ST004D01T	Dummy; 1 = female student, 0 = male student.
Grade	ST001D01T	Categorical
Reading hours	ST175Q01IA	Continuous; 0 = I do not read for enjoyment, 0.5 = 30 minutes or less a day, 1 = more than 3 minutes to less than 60 minutes a day, 2 = 1 to 2 hours a day, 3 = more than 2 hours a day.
Final student weight	W_FSTUWT01~ W_FSTUWT80	Continuous; the final students' weight variable to adjust for bias was developed through sampling.

3.4 Analytic Strategy

3.4.1 Structural Equation Modeling

First, I conducted SEM analysis for the Philippines and Vietnam, based on the model identified through the literature review. Structural equation modeling had various advantages for testing: confirmatory factor analysis and path analysis could be conducted together, contained in the identified model; the fitness of the model could be tested; and the mediation effect of perseverance on academic achievement from family SES could be tested. As comparative research, the multi-group confirmative factor analysis (MGCFA) approach was used.

Before estimating the model, measurement invariance was tested. As multi-group analysis was conducted, it was necessary to test whether the two countries have the same factor structure. Therefore, measurement invariance between the Philippines and Vietnam was tested. The measurement components in this structural equation model included the latent variables: perseverance, parental support, family SES, and academic achievement. To clarify the measurement invariance, the testing was done in two stages: configural invariance and metric invariance (Bollen, 1989; Kline, 2015). In the first stage, configural invariance testing was conducted. The establishment of configural invariance meant that the same common latent variables were present and observable. Once configural invariance was completed, metric invariance was tested. Constraints were added to the factor loadings on the latent variables for both countries based on the configural invariance. If configural invariance is established, the test is finished. If configural invariance is not established, partial configural invariance is tested.

As a value for measurement invariance, the change in the comparative fit index (CFI) value is used as the alternative to the chi-squared test, as suggested (Cheung & Rensvold, 2002). Although the chi-square difference test is commonly used to test measurement invariance, it is sensitive to sample size,

making it more likely to fail to reject a hypothesis (Bentler, 1990; Boomsma, 2000). This research used PISA 2018 data, which contained a large sample size; therefore, a CFI difference test was appropriate. It has been suggested that a change in CFI of less than 0.002 accepts the restricted model, meaning that it establishes metric invariance (Meade et al., 2008).

After the measurement invariance test, the fitness of model was assessed for each measurement model and structural model by various fit indices. To test goodness of fit, root square error of approximation (RMSEA), CFI, and standardized root mean square residual (SRMR) were used. Although the chi-square statistic is one means to test a model—non-significance of the chi-square statistic ($p > 0.05$) means goodness of fit—the chi-square statistic was not appropriate for this test due to its sensitivity to sample size (Bentler, 1990; Boomsma, 2000). The sample size in this study was large; therefore, chi-square indices were only used as references. For the CFI, values greater than 0.90 indicate goodness of fit (Bentler, 1990). Regarding RMSEA, values between 0.05 and 0.08 indicate fair fit, while values greater than 0.1 indicate poor fit (Browne and Cudeck, 1993). In terms of SRMR, values below 0.08 indicate good fit (Hu & Bentler, 1999).

After testing the measurement invariance and the fitness of model, path coefficients were assessed for each country. Control variables were put in the SEM based on model identification. This was crucial, as the lack of a main control variable in the analysis could lead to unreliable or spurious relationships (Bollen, 1989). Therefore, I applied control variables to the model, controlling for gender, parental support, grade, and reading hours.

As a last step in SEM analysis, the mediating effect was clarified with the bootstrap method. There are various methods to test mediating effects, such as Sobel. However, the assumption of the Sobel method has a power problem, causing it to fail to reject null hypotheses even when significant mediating effect

is present (Lockwood & Mackinnon, 1981). The bootstrap method is highly recommended to test the mediating effect by providing empirical sampling distribution (Hayes, 2009; Lockwood & Mackinnon, 1981). I conducted 5,000 samplings for bootstrapping.

The MPlus 7 program was used for SEM analysis to test goodness of fit of the model and the mediating effect of family SES on academic achievement via perseverance. Given that the main outcome variable was continuous, estimation by the weighted lease square method was performed on the regression model. For the missing variables, full information maximization likelihood was used, which provides consistent and unbiased estimates (Enders, 2010).

3.4.2 Fixed-Effects Regression

As a second analysis, multiple and fixed-effects regression analysis was employed to reinforce the robustness of research. The advantage of fixed-effects regression is as follows. First, fixed-effects approach including a school dummy variable can adjust the nested dataset. This cannot be done with mediation analysis in SEM because that is not allowed to use fixed-effects with mediation analysis. In addition, final student weights in regression, which is correcting research design effect. Therefore, by conducting the fixed-effects regression analysis, the robustness of this research can increase.

To answer RQ1, I performed regression analyses of perseverance on family SES in both the Philippines and Vietnam. To obtain a more systematical estimate of association between family SES and perseverance, I used three OLS regression models first; Model 1 included only independent variables, that is, family SES. Then control variables were added to the model (Model 2). Lastly, fixed-effects regression was conducted by entering school dummies in Model 3. The family SES coefficient in Model 3 provided the answer to RQ1.

To answer RQ2, the impact of perseverance on academic achievement was

examined. To estimate the relationship between perseverance and academic achievement, fixed-effects regression analysis was conducted, predicting each academic achievement: reading, math, and science. First, OLS regression analysis on academic achievement predicted only perseverance (Model 1). Then, control variables were included in Model 2. Lastly, school dummies were added to control the heterogeneity associated with schools (Model 3). The coefficient of perseverance on academic achievement answered RQ2. All the analyses of regression were conducted with Stata 17.

For the missing data, the recommended multiple imputation technique was employed (Johnson & Young, 2011). Using the *ice* command in the Stata software package, I generated 20 imputed datasets for variables used in the analysis (Royston, 2004). For the regression analysis, the *mira* option in Stata was utilized with the 20 imputed datasets.

The PISA dataset included the final student weights (w_fstuwt) variable to correct for design effects, normalized for each country. In response to a recommendation to use the final student weight, final student weights were included in the analysis except for Model 3 as fixed-effects regression is not allowed to be conducted with final student weights. In addition, independent errors assumption could be violated if not considering the nature of the PISA dataset, which consisted of two-level data. Therefore, I used the *cluster* option in Stata to correct inflated standard errors in Model 1 and 2 (Rogers, 1994).

3.5 Methodological Limitations

Although this study attempts to estimate unbiased and exact coefficients, there were two methodological limitations. First, the variable of perseverance did not have the exact same scale as the grit scale suggested by Duckworth (Duckworth, 2016; Duckworth et al., 2009).

Second, previous academic achievement, which is related to family SES,

perseverance, and current academic achievement, needed to be controlled for. Many studies related to academic achievement controlled for previous achievement. In addition, studies on non-cognitive skills controlled for IQ to estimate the exact impact of non-cognitive skills. However, I was unable to control for previous academic achievement because the data sets were horizontal. Considering the importance of controlling for previous academic achievement, instead, I controlled for the reading hours at home, which is strongly related to previous academic achievement. Despite this effort, this study is limited in that it only partially controlled for previous academic achievement.

CHAPTER IV. RESULTS

This chapter presents the results of the analyses. First, a descriptive analysis is presented based on data used for the analyses. The descriptive analysis also provides the correlation matrix of the used variables before examining the main results. Following the correlation analysis, the main results are examined with SEM and OLS analyses for each country, the Philippines and Vietnam.

4.1 Descriptive Findings

4.1.1 Descriptive Statistics

Table 8 presents the descriptive statistics of the analyses for both countries. The dependent variables are reading, math, and science achievements, and a mediator is perseverance. Family SES is an independent variable, and the control variables are as follows: gender, immigration status, grade, reading hours and parental support. The first column for each country is the mean score, and the second column shows standard deviation. The last column reports the percentage of missing cases. The perseverance, family SES, and parental support variables are composited with a mean of 0 and a standard deviation of 1 by principal component factor analysis within countries, which is used for OLS analysis.

First, looking at the Philippines' student's achievements, all subject scores are much lower than the OECD average (M = 500, SD = 100): reading (M = 338.56, SD = 78.51), math (M = 351.60, SD = 78.13), and science (M = 357.19, SD=73.08). Components of perseverance show relatively high values (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree); scores on working hard, task persistence, and handling difficult situations are 3 or slightly above; and task persistence has the highest scores (M = 3.02, SD = 0.71), followed by working hard (M = 3.00, SD = 0.73), and handling difficult situations (M = 3.00,

SD = 0.68). Managing tasks has the lowest scores (M = 2.92, SD = 0.60), followed by struggling to master (M = 2.95, SD = 0.76) and overcoming hard times (M = 2.98, SD = 0.67).

Regarding family SES, it has a composite score with a M of 0 and a SD of 1. Average schooling for Filipino parents is 13 years. Parental occupational status is 33.87, a value that matches the International Socio-Economic Index (ISEI)of occupational status. Home possessions is −1.95 (SD = 1.22). This negative value indicates fewer home possessions than what is average in countries participating in PISA.

Female students make up 53.5% of the total number of students. The grades of 15-year-old students vary from grade 7 to grade 10. It should be noted that grade 11 and grade 12 (33 students and 0.55% of the Philippines' sample) are changed to grade 10, as these grades are outliers of the entire sample. Grade 9 students make up the majority of the sample (51%), followed by grade 10 students (32%). However, there are grade 8 students (13%) and grade 7 students (4%) as well. Filipino students spend more than 1.38 hours reading books at home (SD = 0.99). Parental support shows a relatively high score (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree); support for education is the highest (M = 3.29, SD = 0.83), followed by encouraging confidence (M = 3.23, SD = 0.81) and being involved in solving difficulties in school (M = 3.19, SD = 0.79).

When it comes to the Vietnamese sample, reading achievement (M = 503.57, SD = 73.14) is slightly higher than the OECD average (M = 500, SD = 100). Although math achievement (M = 494.19, SD = 73.71) is slightly lower than the OECD average, the science score (M = 542.97, SD = 74.96) is much higher than the OECD average. This means that, overall, Vietnamese students have relatively higher academic achievements than students in other countries participating in PISA.

Scores on perseverance are slightly lower or slightly higher than 3 (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). Overcoming hard times (M = 3.09, SD = 0.60) has the highest score among the six questions, followed by task persistence (M = 3.08, SD = 0.62) and working hard (M = 3.04, SD = 0.59). The remaining three answers on perseverance have scores less than 3: struggling to master (M = 2.87, SD = 0.74), managing tasks (M = 2.93, SD = 0.53), and handling difficult situations (M = 2.91, SD = 0.63).

In terms of family SES, on average, Vietnamese parents have 9.70 years of schooling. The average parental occupation score (ISEI) is 36.19. Home possessions score is −1.67, which means that Vietnamese students have fewer household possessions than the OECD average.

When it comes to other Vietnamese students' characteristics, 51.70% of the students are female, and the majority of 15-year-old students are in grade 10 (95%), while 5% of the 15-year-old students are in grade 9. This is because Vietnamese students enter formal school one year earlier (at six years of age). Therefore, 15-year-old Vietnamese students are in upper secondary school. On average, Vietnamese students read at home for more than 1.14 hours per day (SD = 0.86). Parental support scored high because all items scored higher than 3: encouraging confidence (M = 3.19, SD = 0.75), support for education (M = 3.08, SD = 0.76), and being involved to solve difficulty in school (M = 3.06, SD = 0.73).

Table 8. *Descriptive Statistics.*

	Philippines			Vietnam		
Variables	M	S.D.	Missing (%)	M	S.D.	Missing (%)
Dependent variables						
Reading score***	338.56	78.51	0.00	503.57	73.14	0.00
Math score***	351.60	78.13	0.00	494.19	73.71	0.00
Science score***	357.19	73.08	0.00	542.97	74.96	0.00
Mediator						
Perseverance [a]	0.00	1.00	6.89	0.00	1.00	0.61
Working hard**	3.00	0.73	2.81	3.04	0.59	0.17
Task persistence***	3.02	0.71	3.36	3.08	0.62	0.26
Struggle to master***	2.95	0.76	3.15	2.87	0.74	0.24
Managing task	2.92	0.60	3.39	2.93	0.53	0.26
Overcome hard time***	2.98	0.67	4.09	3.09	0.60	0.20
Handling difficult situation***	3.00	0.68	3.95	2.91	0.63	0.19
Independent variable						
Family SES [a]	0.00	1.00	6.36	0.00	1.00	7.77
Parental education***	13.00	3.07	0.68	9.70	3.38	7.57
Parental occupation***	33.87	19.80	6.19	36.19	21.51	0.26
Home possessions***	-1.95	1.22	0.61	-1.67	0.97	0.02
Control variables						
Female (=1)*	53.50	-	0.00	51.70	-	0.00
Immigration status (=1)***	0.01	-	6.15	0.00	-	2.38
Grade***	9.10	0.78	0.00	9.95	0.22	0.00
Grade 7	0.04	-	-	-	-	-
Grade 8	0.13	-	-	-	-	-
Grade 9	0.51	-	-	0.05	-	-
Grade 10	0.32	-	-	0.95	-	-
Reading hour***	1.38	0.99	1.41	1.14	0.86	1.23
Parental support [a]	0.00	1.00	9.48	0.00	1.00	0.95
Support educational effort***	3.29	0.83	8.64	3.08	0.76	0.89
Involving to solve difficulty in school***	3.19	0.79	8.88	3.06	0.73	0.82
Encouraging confidence**	3.23	0.81	9.10	3.19	0.75	0.87

Data and Sample: PISA 2018. The Philippines' student n = 7,233; Vietnam's student n = 5,377.
Note: [a] These variables are standardized within each country (M = 0, SD = 1). *Indicates significant mean difference between the Philippines and Vietnam at ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed tests).

Comparing the descriptive statistics of the Philippines and Vietnam, differences between the two countries can be found. Vietnamese students show strikingly higher academic achievement in all subjects than Filipino students. The average of each perseverance item is different between the two countries except for the managing task component. In terms of working hard, task persistence, managing task, and overcoming hard times, Vietnamese students had higher scores, but Filipino students scored higher in struggling to master and handling difficult situation. All components of family SES are statistically different between the Philippines and Vietnam. Filipino parents have more years of schooling, but occupational status and home possessions scores are higher in Vietnam. The percentage of female students is slightly higher in the Philippines. The percentage of students having an immigration background is lower in Vietnam than in the Philippines, but both countries have less than 1% of students with immigration backgrounds. Differences in grades can also be found: 51% of the Filipino students aged 15 are in grade 9, while 95% of the Vietnamese students that are 15 years old are in grade 10. Therefore, half of 15-year-old students in the Philippines are in the last year of junior high school, while most students aged 15 in Vietnam are in the first year of upper secondary school.

In terms of missing cases, there are no missing values on three independent variables: reading, math, and science achievements. For the variable of perseverance, 6.89% of the cases are missing in the Philippines, whereas only 0.61% are missing in Vietnam. Regarding family SES, the missing percentage value is higher for Vietnam (7.77%) than for the Philippines (6.36%). For the control variables, gender and grade have no missing cases. Reading hour has 1.41% missed cases in the Philippines and 1.23% missed cases in Vietnam. Parental support shows a high discrepancy between missing cases in the two countries at 9.48% in the Philippines and 0.95% in Vietnam. Overall, while several variables have missing cases, the numbers are relatively small (less than

10%).

4.1.2 Correlations

Table 9 illustrates the correlation matrix for each country between the variables used in the analyses. In the Philippines, academic achievements are positively correlated with perseverance (0.32, on average). In addition, academic achievements are also positively correlated with family SES (0.39, on average). Gender is weakly correlated with reading scores (0.16) but hardly correlated with math (0.07) and science scores (0.01). Grade and reading hours also positively correlated with academic achievements (0.33 and 0.23, on average). Parental support correlates with academic achievement (0.22, on average). Perseverance is highly and positively correlated with parental support (0.40), and positively correlated with family SES (0.18) and grade (0.23). Family SES is positively related to grade (0.17), parental support (0.12), and reading hours (0.11). Reading hours and parental support also correlate.

Looking at the correlation matrix for Vietnam, perseverance is weakly and positively correlated with academic achievements (0.04, on average), although family SES is highly and positively correlated with academic achievement (0.31, on average). Similar to the Filipino data, the reading score is correlated with female gender (0.11) but hardly correlated with math (−0.00) and science scores (0.00). Grade has a relation with academic achievement (0.17, on average) and reading hours correlates with academic achievements (0.14, on average). Parental support is not correlated with academic achievement (0.02, on average). Perseverance is only positively correlated with parental support (0.23), although it shows weak correlation with several other variables: family SES, female, and grade. Family SES is correlated with reading hour (0.14).

Table 9. *Correlations Between Key Variables.*

Philippines	1	2	3	4	5	6	7	8	9
1. Reading score	1.00								
2. Math score	0.86 ***	1.00							
3. Science score	0.89 ***	0.80 ***	1.00						
4. Perseverance [a]	0.34 ***	0.35 ***	0.27 ***	1.00					
5. Family SES [a]	0.42 ***	0.37 ***	0.37 ***	0.18 ***	1.00				
6. Female	0.16 ***	0.07 ***	0.01	0.08 ***	-0.05 ***	1.00			
7. Grade	0.34 ***	0.36 ***	0.28 ***	0.23 ***	0.17 ***	0.12 ***	1.00		
8. Reading hour	0.28 ***	0.19 ***	0.21 ***	0.18 ***	0.11 ***	0.31 ***	0.11 ***	1.00 ***	
9. Parental support [a]	0.23 ***	0.25 ***	0.19 ***	0.40 ***	0.12 ***	0.06 ***	0.19 ***	0.11 ***	1.00
Vietnam	1	2	3	4	5	6	7	8	9
1. Reading score	1.00								
2. Math score	0.70 ***	1.00							
3. Science score	0.77 ***	0.72 ***	1.00						
4. Perseverance [a]	0.04 ***	0.05 **	0.03 **	1.00					
5. Family SES [a]	0.33 ***	0.32 ***	0.28 ***	0.06 ***	1.00				
6. Female	0.11 ***	-0.00	0.00	0.00	-0.03 *	1.00			
7. Grade	0.19 ***	0.18 ***	0.15 ***	0.00	0.08 ***	0.07 ***	1.00		
8. Reading hour	0.15 ***	0.12 ***	0.12 ***	0.12 ***	0.14 ***	0.16 ***	0.03 *	1.00	
9. Parental support [a]	0.03	0.02	0.01	0.23 ***	0.06 ***	0.04 *	0.01	0.06 ***	1.00

Data and Sample: PISA 2018. The Philippines' student n = 7,233; Vietnam's student n = 5,377.
Note: [a] These variables are standardized within each country (M = 0, SD = 1). ***p < 0.001, **p < 0.01, *p < 0.05 (two-tailed tests).

In sum, family SES and academic achievement are correlated in both countries. However, family SES is weakly correlated with perseverance in the Vietnam while high correlation is shown in the Philippines. Relationship between perseverance and academic results also shows different correlations; the Philippines demonstrates high correlation, but Vietnam shows only weak correlation.

4.2 Structural Equation Modeling Analysis

This section describes the SEM analysis that was employed to answer the research questions. It consists of three parts: testing measurement invariance, assessment of model fit, and results of the SEM analysis.

4.2.1 Measurement Invariance and Assessment of Model Fit

As a first step in the SEM analysis, I tested measurement invariance for the measurement model, as this study employs MGCFA. For MGCFA, it is suggested to examine configural invariance then metric invariance or partial metric invariance (Bollen, 1989; Kline, 2015).

The findings on measurement invariance can be seen in Table 10. In the table's second row, the configural invariance test is shown. To compare configural invariance and metric invariance, metric invariance testing followed. Metric invariance assumed that factor loadings of items in the measurement model are restricted across the countries, that is, the Philippines and Vietnam had the same factor loadings. If the CFI change from configural invariance to measurement invariance is less than 0.002, measurement invariance is supported (Meade et al., 2008). However, the change in CFI is 0.008, indicating that metric invariance is not supported (Meade et al., 2008). Therefore, I tested partial metric invariance. I restricted perseverance items, as this research focuses on perseverance rather than other variables. So, I only restricted two items in

perseverance: managing tasks and handling difficult situations. The CFI change from configural invariance to partial metric invariance is less than 0.002, supporting partial measurement invariance.

Table 10. *Measurement Invariance Test for Multi-Group Confirmative Factor Analysis*.

	χ^2	*df*	CFI	RMSEA	SRMR	ΔCFI	sig
Configural Invariance	2914.946	168	0.964	0.051	0.038		
Metric Invariance	3524.566	179	0.956	0.054	0.054	0.008	$p < 0.001$
Partial Metric Invariance	2931.457	170	0.964	0.051	0.038	0.000	$p < 0.05$

Following the measurement invariance test, the fitness of model was examined. The findings are shown in Table 11. The CFI is 0.934, which is greater than 0.90, indicating good fit (Bentler, 1990). The RMSEA is 0.056, which is between 0.05 and 0.08, which indicates fair fit (Browne and Cudeck, 1993). The SRMR is 0.041, which is less than 0.08, indicating good fit (Hu & Bentler, 1999). All indices—CFI, RMSEA, and SRMR—indicate either good or fair fit of the SEM model, which allowed me to conduct the next analysis.

Table 11. *Goodness of Fit Indices for the Structural Model.*

	χ^2	*df*	CFI	RMSEA	SRMR
Structural model	5,347.063	268	0.934	0.056	0.041

4.2.2 Estimation of Structural Equation Modeling

This part shows the findings of the SEM analysis. First, the measurement model is identified. Next, the structural model is presented for each country, that is, the Philippines and Vietnam. Last, the indirect effect of perseverance is

examined.

The measurement model includes four variables: perseverance, family SES, parental support, and academic achievement. Figure 6 and Figure 7 show the perseverance factor loadings for each country. Through the measurement invariance test, three of the perseverance items, namely, working hard, managing tasks, and handling difficult situations, are restricted to satisfy partial metric invariance.

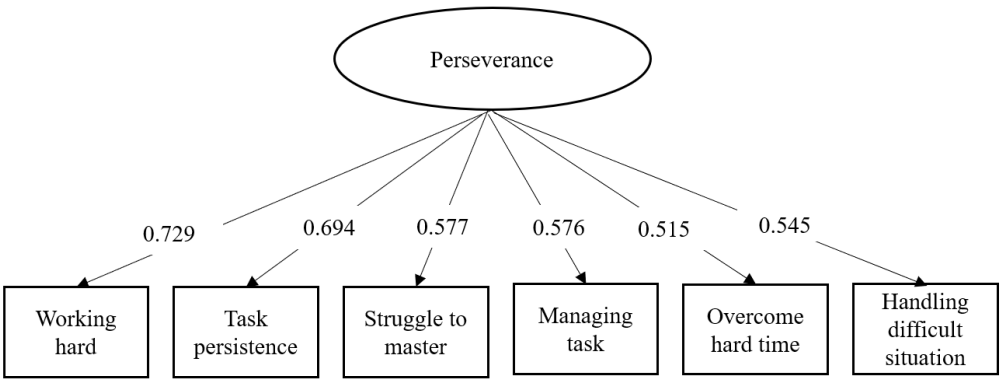

Figure 6. *Perseverance Factor Loadings for the Philippines (Standardized Estimate).*

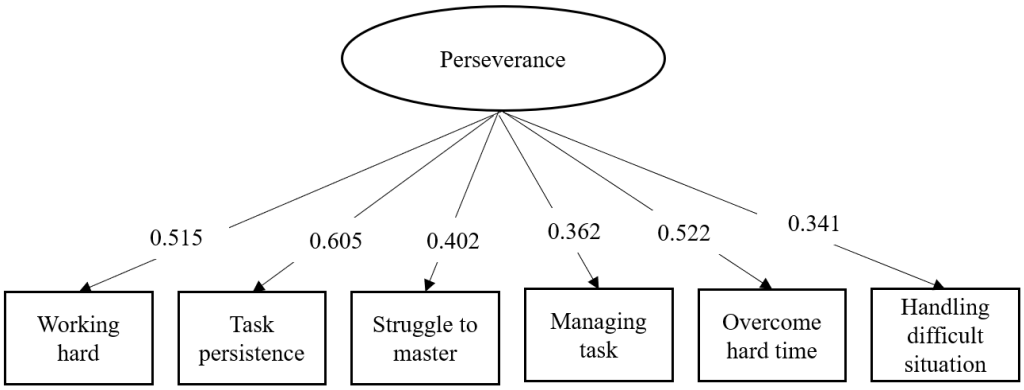

Figure 7. *Perseverance Factor Loadings for Vietnam (Standardized Estimate).*

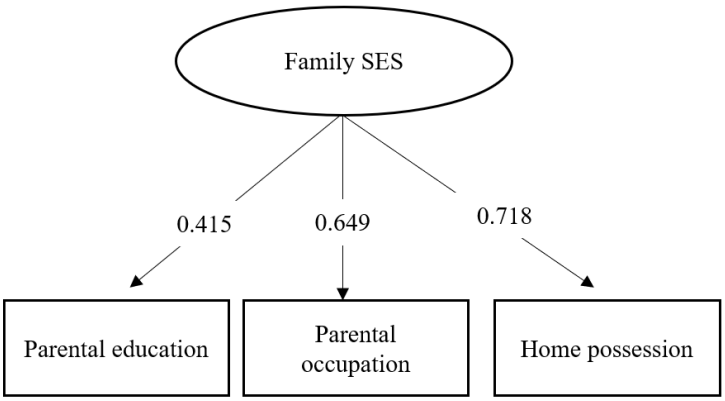

Figure 8. *Family SES Factor Loadings for the Philippines (Standardized Estimate).*

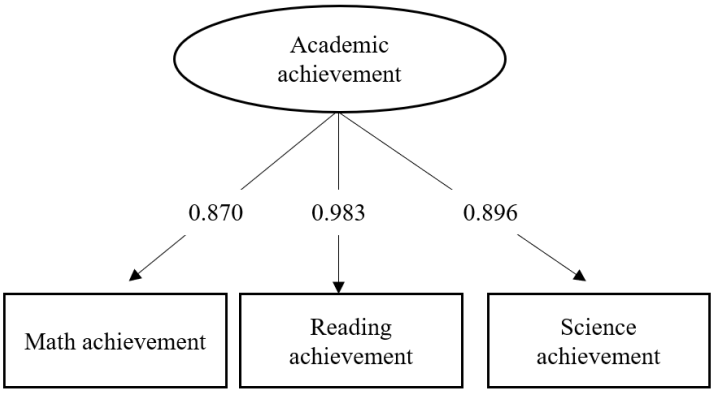

Figure 9. *Academic Achievement Factor Loadings for the Philippines (Standardized Estimate).*

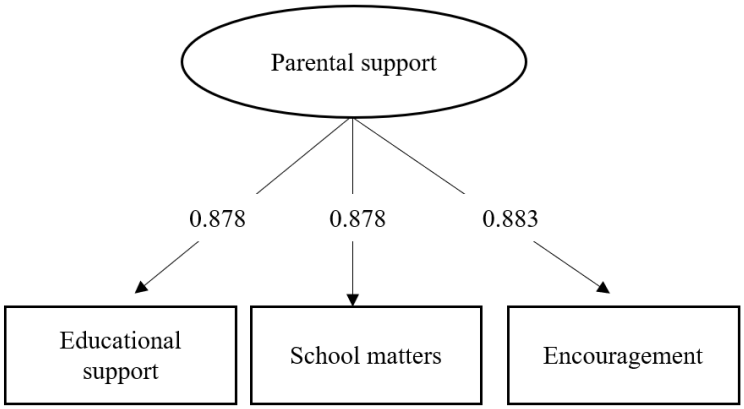

Figure 10. *Parental Support Factor Loadings for the Philippines (Standardized Estimate).*

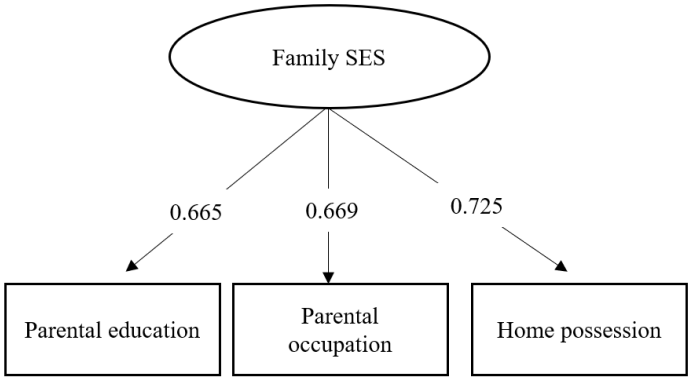

Figure 11. *Family SES Factor Loadings for Vietnam (Standardized Estimate).*

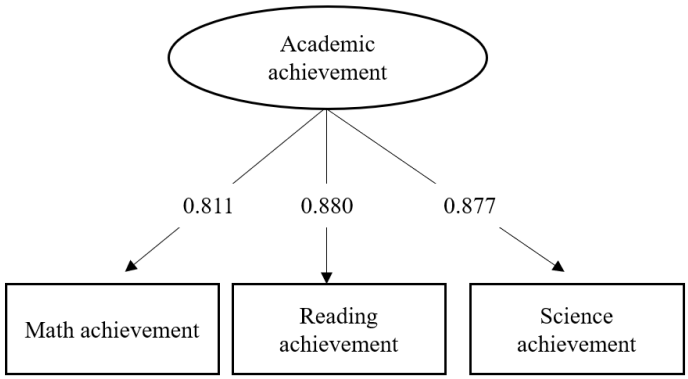

Figure 12. *Academic Achievement Factor Loadings for Vietnam (Standardized Estimate).*

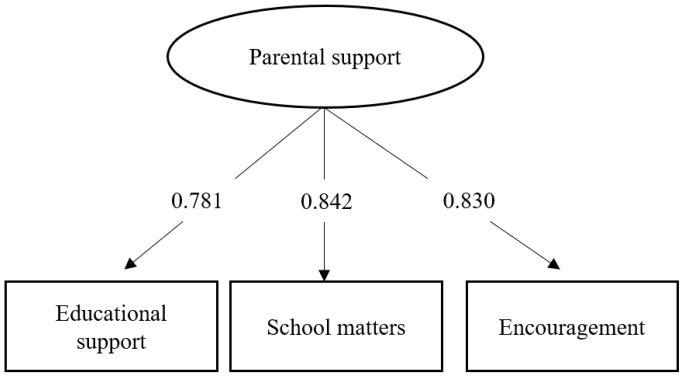

Figure 13. *Parental Support Factor Loadings for Vietnam (Standardized Estimate).*

Factor loadings for family SES, parental support, and academic achievement can be seen in Figures 8–13 for each country. The factor loadings for family SES and academic achievement are not restricted.

Table 12 displays the result of path unstandardized and standardized parameter estimates on the Filipino sample. To answer RQ1, the path from family SES to perseverance is examined. In the second row of Table 12, the effect of family SES on perseverance is statistically significant, suggesting that family SES significantly impacts perseverance ($p < 0.001$).

The RQ2 was about the relationship between perseverance and academic achievement. The results indicate that student perseverance is statically significant in the Philippines ($p < 0.001$). One increase in perseverance increases academic achievement by 23.865.

Next, the data from Vietnam were analyzed (Table 13). First, I looked at the path coefficient from family SES to perseverance. The result of the path coefficient from family SES to perseverance is not significant, indicating that family SES does not impact perseverance of 15-year-old students in Vietnam. It is also estimated the path coefficient from perseverance to academic achievement. The path coefficient is 3.336, which is not statistically significant ($p < 0.05$).

Table 12. *Path Coefficient Results for the Philippines.*

Parameter	Unstandardized Estimate	S.E.	Standardized Estimate
SES→ Perseverance	0.054***	0.007	0.130
Parental support → Perseverance	0.299***	0.015	0.413
Female → Perseverance	0.032*	0.014	0.031
Grade → Perseverance	0.092***	0.010	0.136
Immigrant status → Perseverance	-0.277**	0.081	-0.053
Reading hour → Perseverance	0.057***	0.007	0.108
SES → Parental support	0.093***	0.009	0.163
Immigrant status → Parental support	-0.813***	0.111	-0.113
Parental support → Reading hour	0.128***	0.019	0.093
Grade → Reading hour	0.085***	0.016	0.066
SES → Reading hour	0.092***	0.014	0.117
Immigrant status → Reading hour	-0.084	0.121	-0.008
SES → Grade	0.117***	0.010	0.192
Parental support → Grade	0.212***	0.016	0.198
Immigrants status → SES	0.155	0.190	0.012
Perseverance → Academic achievement	23.865***	2.006	0.186
SES → Academic achievement	23.703***	1.327	0.448
Parental support → Academic achievement	4.020**	1.273	0.043
Female → Academic achievement	9.548***	1.457	0.071
Grade → Academic achievement	15.309**	0.973	0.176
Immigrants status → Academic achievement	-31.269***	7.079	-0.047
Reading hour → Academic achievement	8.577***	0.745	0.127

Data and Sample: PISA 2018. The Philippines' student n = 7,233; Vietnam's student n = 5,377. ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed tests).

Table 13. *Path Coefficient Results for Vietnam.*

Parameter	Unstandardized Estimate	S.E.	Standardized Estimate
SES→ Perseverance	0.005	0.003	0.039
Parental support → Perseverance	0.155***	0.014	0.303
Female → Perseverance	-0.006	0.010	-0.010
Grade → Perseverance	-0.002	0.026	-0.001
Immigrant status → Perseverance	-1.063***	0.301	-0.098
Reading hour → Perseverance	0.042***	0.006	0.121
SES → Parental support	0.020***	0.005	0.077
Immigrant status → Parental support	-0.410	0.515	-0.019
Parental support → Reading hour	0.078**	0.023	0.053
Grade → Reading hour	0.053	0.056	0.013
SES → Reading hour	0.067***	0.007	0.178
Immigrant status → Reading hour	-0.234	0.381	-0.008
SES → Grade	0.008***	0.002	0.085
Parental support → Grade	0.001	0.006	0.003
Immigrants status → SES	0.247	1.193	0.003
Perseverance → Academic achievement	3.336	3.815	0.017
SES → Academic achievement	10.618***	0.528	0.404
Parental support → Academic achievement	-2.603	1.577	-0.026
Female → Academic achievement	4.688**	1.632	0.039
Grade → Academic achievement	47.036***	3.846	0.170
Immigrants status → Academic achievement	-16.203	28.456	-0.008
Reading hour → Academic achievement	4.961***	0.995	0.072

Data and Sample: PISA 2018. The Philippines' student n = 7,233; Vietnam's student n = 5,377. ***$p < 0.001$, **$p < 0.01$ (two-tailed tests).

Table 14. *Family SES Indirect Effect on Academic Achievement***.**

	Philippines	Vietnam
Direct Effects	23.703***	10.618***
Indirect Effects (via perseverance)		
SES → **perseverance** → Academic achievement	1.283***	0.017
SES → Grade → **perseverance** → Academic achievement	0.256***	0.000
SES → Reading hour → **perseverance** → Academic achievement	0.125***	0.010
SES → Parental support → **perseverance** → Academic achievement	0.663***	0.010
SES → Parental support → Grade → **perseverance** → Academic achievement	0.043***	0.000
SES → Grade → Reading hour → **perseverance** → Academic achievement	0.013***	0.000
SES → Parental support → Reading hour → **perseverance** → Academic achievement	0.016***	0.000
SES → Parental support → Grade → Reading hour → **perseverance** → Academic achievement	0.002***	0.000
Total Effects	29.556***	11.327***

Data and Sample: PISA 2018. The Philippines' student n = 7,233; Vietnam's student n = 5,377. ***$p < 0.001$ (two-tailed tests).

Finally, the direct and indirect effects were analyzed (Table 14) to answer RQ3. The findings indicate that the direct impact of family SES on academic achievement is significant in both the Philippines and Vietnam, while there are different results for the indirect effect via perseverance, as the effect is two times higher in the Philippines. While the indirect effect of perseverance on academic achievement is significant in the Philippines, there is no indirect effect via perseverance in Vietnam. In the Philippines, 8.12% of the total effect of perseverance on academic achievement is mediated through perseverance.

Figure 14 and Figure 15 are diagrams of the research model for each county with path coefficients. A solid line in the diagram means significant effect, and a dashed line means non-significant effect ($p < 0.05$). Looking at the research results in the diagrams, the two countries demonstrate clear differences in perseverance. In the Philippines, the role of perseverance in educational inequality is more pronounced than in Vietnam. The effect of immigration status on family SES is not significant and its effect on reading hours is non-significant in the Philippines. The effect of immigration status on family SES, parental support, and academic achievement is non-significant in Vietnam. This may be because students with an immigration background are a minority in both countries. Similarly, the effect of grade on perseverance and reading hours at home is non-significant in Vietnam, and that of parental support on grade is also non-significant. This could be because 15-year-old Vietnamese students are in grade 10, variation is limited, and the path related to grade is not significant.

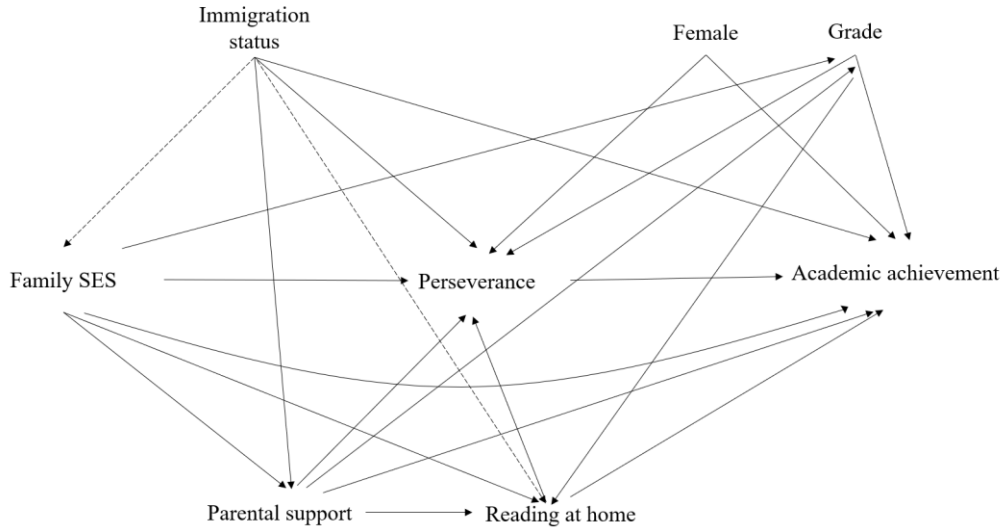

Figure 14. *The Philippines' SEM Results with Significance of Path.*

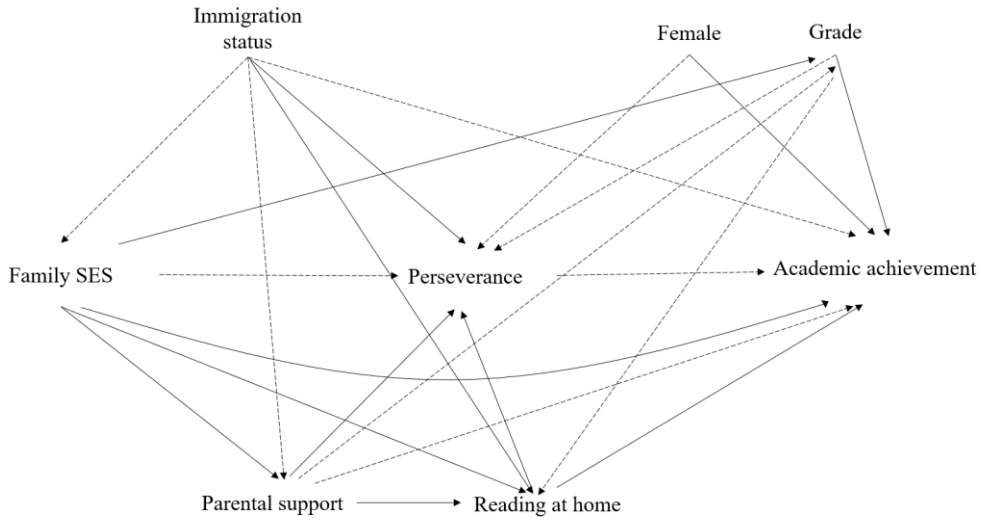

Figure 15. *Vietnam's SEM Results with Significance of Path.*

4.3 Analysis of Multiple Regression Models

For the second analysis, fixed-effects regression is conducted to strengthen the robustness of research results. Although the SEM analysis answered the research questions, this part increased the robustness of the study by allowing the fixed-effects approach and adding weight variables to correct for research design effect.

4.3.1 Effects of Family SES on Perseverance

In the first stage of the second analysis, the impact of family SES on perseverance was tested for both the Philippines and for Vietnam (Table 15). Model 1 contained only an independent variable. In Model 2, control variables were added, and lastly, fixed-effects regression was conducted in Model 3 by including independent and control variables. In this section, the results for the Philippines are interpreted first, followed by those for Vietnam.

Looking at the results for the Philippines, family SES is significant in Model 1 ($p < 0.001$). In Model 2, the coefficient of family SES is diminished to 0.101, which means that one standard deviation increase in family SES increases perseverance by 0.101 ($p < 0.001$). In Model which includes a series of school dummies 3, the coefficient is reduced again to 0.080 ($p < 0.001$).

Table 15. *Fixed-Effects Regression Results of Perseverance.*

	Philippines			Vietnam		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
Independent variable						
Family SES [a]	0.192*** (0.017)	0.101*** (0.014)	0.080*** (0.014)	0.053* (0.006)	0.023 (0.021)	0.037* (0.017)
Control variables						
Parental support [a]		0.360*** (0.018)	0.346*** (0.012)		0.229*** (0.020)	0.205*** (0.013)
Female (=1)		0.016 (0.023)	0.034 (0.023)		-0.041 (0.030)	-0.042 (0.027)
Immigration status (=1)		-0.462** (0.171)	-0.430** (0.145)		-2.578** (0.846)	-2.294*** (0.652)
Grade (Philippines-ref-grade 7, Vietnam ref- grade 9)						
Grade 8		0.225** (0.075)	0.242*** (0.065)		-	-
Grade 9		0.487*** (0.072)	0.492*** (0.061)		-	-
Grade 10		0.601*** (0.072)	0.612*** (0.063)		0.050 (0.162)	-0.717 (0.399)
Reading hours		0.106*** 0(0.013)	0.096*** (0.012)		0.123*** (0.017)	0.117*** (0.016)
School dummies	no	no	yes	no	no	yes
Intercept	-0.030	-0.637*** (0.072)	-0.641*** (0.012)	0.006 (0.027)	-0.609 (1.611)	7.026 (3.971)
R^2	0.037	0.237	0.206	0.003	0.073	0.066

Data and Sample: PISA 2018. The Philippines' student *n* = 7,233; Vietnam's student n = 5,377.
Note: [a] These variables are standardized within each country (M = 0, SD = 1). The estimates with robust standard errors are an average of the results across 20 imputed datasets by using Rubin's rule. ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed tests).

The results for Vietnam show differences from the Filipino sample. Looking at the results for Model 1 for Vietnam, the family SES is significantly related to perseverance ($p < 0.05$), however it is about a quarter effect size compared to the Philippines. Once Model 1 is conducted, family SES is added in Model 2. Model 2 for the data from Vietnam shows that family SES had become statistically insignificant, meaning that family SES is not associated with perseverance when controlling other individual variables. Lastly, when school dummies are included, the coefficient has become significant ($p < 0.05$), but it is half the size of the effect in the Philippines. In sum, family SES impacts student perseverance in the Philippines, which means that students with higher SES tend to have a higher level of perseverance in the Philippines, controlling for other covariates. However, the result for Vietnam was different. In Model 3, the effect of perseverance is significant ($p < 0.05$), but this number is less than half of the Filipino figure.

4.3.2 Effects of Perseverance on Academic Achievement

The next analyses examined the impact of perseverance on each academic achievement: reading, math, and science. At this stage, Models from 1 to 3 for each country were analyzed. Model 1 regressed academic achievement on only an independent variable, and Model 2 included individual control variables in Model 1. Lastly, Model 3 included school dummies to Model 2. Reading achievement was analyzed first, followed by math then science.

First, the first column of Table 16 shows the results for Model 1 with Filipino data. Perseverance is significantly related to reading score ($p < 0.001$). Model 2 of the Philippines includes the control variables. According to the results for Model 2, perseverance impacts reading score in the Philippines. One standard deviation increases in perseverance results in a 12.173 increase in reading score ($p < 0.001$). The coefficient of perseverance in Model 3

demonstrated significance, which means perseverance influences the reading score, controlling individual and school. All the covariates are significantly associated with reading achievement except for immigration status ($p < 0.01$).

The fourth to sixth column of Table 16 show the results for Vietnam. Model 1 was analyzed with only independent variables in the same way as for the Philippines. In Model 1, perseverance is positively associated with reading score ($p < 0.01$). Model 2 was analyzed next. Regarding the coefficient of perseverance in Model 2, it turned to be 1.505, which is not statistically significant. The coefficient of perseverance in Model 3 was also insignificant.

Table 16. *Fixed-Effects Regression Results of Reading Achievement.*

	Philippines			Vietnam		
	Model 1	Model 2	Model3	Model 1	Model 2	Model3
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
Independent variable						
Perseverance [a]	21.420*** (1.223)	12.173*** (1.059)	11.768*** (0.771)	3.648** (1.396)	1.505 (1.167)	0.459 (0.891)
Control variables						
Family SES [a]		26.633*** (2.382)	11.032*** (0.808)		22.776*** (1.821)	9.687*** (1.072)
Parental support [a]		5.773*** (0.912)	5.017*** (0.768)		−0.339 (2.0870)	-0.216 (-0.874)
Female (=1)		14.745*** (1.805)	12.558*** (1.385)		15.333*** (2.087)	9.032*** (1.706)
Immigration status (=1)		−31.671 (8.030)	-30.117*** (7.037)		−15.345 (27.819)	-21.462 (33.402)
Grade (Philippines ref-grade 7, Vietnam ref-grade 9)						
Grade 8		7.282** (3.258)	7.518* (3.651)		-	-
Grade 9		38.362*** (3.343)	33.718** (3.409)		-	-
Grade 10		57.035*** (3.617)	56.483*** (3.553)		56.866*** (5.042)	25.712 (25.465)
Reading hours		12.522*** (0.922)	10.889*** (0.716)		7.450*** (1.115)	6.746*** (1.028)
School dummies	no	no	yes	no	no	yes
Intercept	340.293*** (3.328)	276.827*** (3.255)	281.554*** (3.408)	503.217*** (1.396)	433.643*** (4.340)	466.764*** (24.268)
R^2	0.123	0.369	0.270	0.003	0.168	0.035

Data and Sample: PISA 2018. The Philippines' student *n* = 7,233; Vietnam's student n = 5,377.
Note: [a] These variables are standardized within each country (M = 0, SD = 1). The estimates with robust standard errors are an average of the results across 20 imputed datasets by using Rubin's rule. ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed tests).

Table 17 and Table 18 present the OLS regression results on math and science achievement, respectively, for each country. The models are tested the same way as for reading achievement. Model 1 includes only the independent variable, and Model 2 includes the control variables. Finally, fixed-effects regression was conducted.

Table 17 shows the impact of perseverance on math achievement for the Philippines and Vietnam. In Model 3, one standard deviation in perseverance increases the math score by 13.074. However, in Vietnam, this relationship is not statistically significant in Model 3 which is the final model ($p < 0.001$). Table 18 presents the results of the impact on science achievement. The results are in line with those for reading and math achievements, with few differences in covariate results. In Model 3 for the Philippines, perseverance is correlated with family SES; however, Model 3 for Vietnam shows perseverance has no significant impact on science score.

To summarize, the results of regression of academic achievement shows the difference in impact of perseverance between the Philippines and Vietnam. Perseverance is positively correlated with all subject scores in the Philippines, whereas the relationship is not significant in Vietnam. Another covariate coefficient is parental support. Parental support is significantly associated with achievement in all subjects in the Philippines. However, in Vietnam, parental support is not correlated with achievement in all subjects.

Table 17. *Fixed-Effects Regression Results of Math Achievement.*

	Philippines			Vietnam		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
Independent variable						
Perseverance [a]	28.588*** (1.299)	13.660*** (1.138)	13.074*** (0.830)	3.800** (1.306)	2.083 (1.207)	1.095 (0.890)
Control variables						
Family SES [a]		21.384*** (2.134)	7.196*** (0.856)		22.382*** (1.733)	9.639*** (1.052)
Parental support [a]		7.985*** (0.917)	7.219*** (0.808)		-1.027 (1.118)	-0.999 (0.875)
Female (=1)		2.182 (1.740)	1.278 (1.439)		-0.714 (2.042)	-7.246*** (1.714)
Immigration status (=1)		-56.099*** (9.499)	-56.203*** (7.177)		14.191 (46.912)	-3.277 (36.895)
Grade (Philippines-ref-grade 7, Vietnam ref- grade9)						
Grade 8		13.941** (4.234)	12.848** (3.796)		-	-
Grade 9		50.892*** (4.159)	44.426*** (3.549)		-	-
Grade 10		70.863*** (4.520)	66.703*** (3.699)		60.292*** (10.483)	31.210 (25.518)
Reading hour		7.097*** (0.856)	5.545*** (0.745)		5.885*** (1.264)	5.314*** (1.310)
School dummies	no	no	yes	no	no	yes
Intercept	353.254*** (3.080)	292.601*** (4.325)	281.554*** (3.408)	495.209*** (3.790)	431.559*** (9.962)	462.174*** (24.319)
R^2	0.135	0.333	0.270	0.003	0.147	0.028

Data and Sample: PISA 2018. The Philippines' student *n* = 7,233; Vietnam's student n = 5,377.
Note: [a] These variables are standardized within each country (M = 0, SD = 1). The estimates with robust standard errors are an average of the results across 20 imputed datasets by using Rubin's rule. ***$p < 0.001$, **$p < 0.01$ (two-tailed tests).

Table 18 *Fixed-Effects Regression Results of Science Achievement.*

	Philippines			Vietnam		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
Independent variable						
Perseverance [a]	20.799*** (1.104)	9.127*** (1.039)	8.542*** (0.786)	3.527** (1.325)	1.819 (1.204)	0.862 (0.960)
Control variables						
Family SES [a]		22.144*** (2.411)	8.397*** (0.786)		19.836*** (1.752)	6.822*** (1.157)
Parental support [a]		4.873*** (0.898)	4.215*** (0.776)		-1.019 (1.074)	-1.136 (-.938)
Female (=1)		-6.544*** (1.650)	-7.961*** (1.390)		0.532 (2.350)	-5.718** (1.839)
Immigration status (=1)		-13.505 (9.035)	-15.051* (7.277)		-33.887 (36.066)	-23.769 (35.785)
Grade (Philippines-ref-grade 7, Vietnam ref- grade9)						
Grade 8		12.922** (3.812)	13.217** (3.671)		-	-
Grade 9		34.572*** (3.363)	30.375*** (3.430)		-	-
Grade 10		50.871*** (3.813)	51.534*** (3.576)		47.844*** (4.570)	77.728** (35.785)
Reading hour		9.894*** (0.934)	8.513*** (0.719)		6.641*** (1.350)	6.619*** (27.400)
School dummies	no	no	yes	no	no	yes
Intercept	358.491*** (3.057)	312.957*** (3.465)	316.682*** (3.430)	543.525*** (3.362)	490.234*** (3.769)	464.970*** (26.113)
R^2	0.082	0.258	0.163	0.002	0.110	0.019

Data and Sample: PISA 2018. The Philippines' student *n* = 7,233; Vietnam's student n = 5,377.
Note: [a] These variables are standardized within each country (M = 0, S.D. = 1). The estimates with robust standard errors are an average of the results across 20 imputed datasets by using Rubin's rule. ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed tests).

CHAPTER V. DISCUSSION AND CONCLUSION

5.1 Major Findings

This research aimed to demonstrate the role of perseverance in the transmission of intergenerational inequality in the Philippines and Vietnam. There has been increasing research on educational inequalities, specifically on the effect of parental SES on academic achievement, and many scholars have researched the mechanism behind the effect. However, these studies concentrated on Western country contexts without consideration of developing countries. This is also because access to education was deemed the more urgent issue for developing countries. Therefore, this research focused on perseverance as a critical non-cognitive skill and mediating factor in educational inequality in developing countries. The Philippines and Vietnam were selected for their distinct education differentiation systems. The major findings are summarized in three parts.

5.1.1 Stratified Perseverance

The first research question was about how perseverance is predicted by family SES in the Philippines and Vietnam. At the start of the research, I hypothesized that in the Philippines, stratified perseverance would mean that students with higher family SES would tend to have higher levels of perseverance. In the growing debate on grit, only the individual factor has been highlighted, ignoring the structural aspects that can impact non-cognitive skills (Gorski, 2016; Tierney & Almeida, 2017). This study proved stratified perseverance by showing the impact of family SES on perseverance in the Philippines and Vietnam.

According to the research results, this stratified perseverance is not the same in all countries. Stratified perseverance was found in the Philippines, where

educational differentiation before university is rare, but the effect was not significant or very little in Vietnam. In the Philippines, family SES contributed to shaping student perseverance, therefore, students with higher family SES were more likely to have higher levels of perseverance. However, this was not the same for Vietnamese students who are stratified according to their academic achievement when entering upper secondary school as 15-year-olds. Vietnamese upper secondary school students are stratified according to their university entrance examination results.

These different results between the Philippines and Vietnam for stratified perseverance are consistent with previous research (Buchmann & Dalton, 2002; Buchmann & Park, 2009). Previous studies also showed that students' future expectations are influenced by parental SES and expectations in countries with less differentiated school systems, while students in highly differentiated school systems are not influenced by the type of school or family SES. This study's findings suggest that the impact of family SES on perseverance can be distinguished by the country's educational differentiation.

5.1.2 Perseverance Effect on Academic Achievement

The second research question was about the impact of perseverance on academic achievement. Existing literature showed mixed results in terms of the impact of grit on academic achievement. Several scholars explained the different impact of grit based on culture, but the explanations are not consistent. Therefore, this research compared the Philippines and Vietnam, which have many similarities except the educational differentiation in education. In the Philippines, where educational differentiation is rarely conducted, the impact of perseverance on academic achievement was significant. In contrast, the impact of perseverance was not significant for 15-year-old students in Vietnam, where educational stratification is conducted at upper secondary level.

The findings of this study relate to the research by Trautwein et al. (2006) which showed that the relationship between self-esteem and academic achievement varies according to the degree of educational differentiation. In the study, the impact of self-esteem on academic achievement was not significant for students in West Germany which had an early tracking system, whereas the impact was significant for students in East Germany which had a comprehensive education system. Similarly, this study illustrated that the impact of perseverance is only significant in counties with comprehensive education systems.

5.1.3 Indirect Effect of Perseverance

The third research question was about the indirect effect of perseverance in the impact of family on academic achievement. Therefore, I tested the mediation effect of perseverance in the path from family SES to academic achievement. According to the research findings, the mediating role of perseverance from family SES to academic achievement was significant only in the Philippines. 8.12% of the impact of family SES on academic achievement was mediated in the Philippines, while the mediation effect was not found in Vietnam, meaning that perseverance did not contribute to the effect of family SES on academic achievement. The results imply that perseverance has a critical impact in preventing intergenerational transmission of inequalities in the Philippines while perseverance does not have a significant effect in Vietnam.

5.2 Discussion

Research findings illustrate that perseverance can be constructed by family SES in the Philippines which has less educational differentiation. Furthermore, this research demonstrates that perseverance is significant for academic achievement in the Philippines but not significant in countries with highly differentiated systems, such as Vietnam. Finally, perseverance is mediating the

path from family SES to academic achievement in counties with less differentiated school systems.

This section discusses the implications and the contributions of this research. First, the research results are related to the contexts of the Philippines and Vietnam. Second, the theory of emotional capital is discussed, and third, implications for meritocratic societies are discussed. Fourth, implications for international education research are outlined.

5.2.1 Different Role of Non-Cognitive Skills in the Contexts of Philippines and Vietnam

This comparative research demonstrates how the role of perseverance differs in the Philippines and Vietnam. Both countries are lower middle-income countries with issues of economic inequalities, while these countries have contrasting educational differentiation systems for 15-year-old students. This section discusses the findings with each country context.

Historically, access to education was long restricted during the Spanish colonial era (1521-1898) in the Philippines. Therefore, although modern schools began early in the Philippines compared to other Asian countries, they operated only for the ruling parties and their allies. At the end of Spanish colonial period, Three-year free normal education was allowed for the public with the Education Decree of 1863. The current education system based on Education Act of 1901 was much influenced by the US (Musa & Ziatdinov, 2012). The historical background shows that mass education has been implemented quite recently in the Philippines.

However, the Vietnamese education system has a long history with the influence of Confucianism. For example, Le dynasty (1428-1788) emphasized human resource and promoted educational participation for the affluent. Mass education persisted even during the French colonial era although the curriculum

was modified by the French (Truong, Hallinger & Sanga, 2017; Nguyen, 2012). The Vietnamese also value education based on Confucianism influence from China (Truong, Hallinger & Sanga, 2017). Their enthusiasm for education is apparent in the gifted education system. MOET and Hanoi University organized a special program for mathematics-gifted learners in 1964 (Nguyen, 2012). In the 1980s, the special class was expanded to other subjects on Literature, Foreign Languages, Physics, Chemistry, Biology, Informatics, History, and Geography as the schools for gifted students were first established (Nguyen, 2012). Although the schools for gifted has been criticized for taking more than twice the budget of other public schools, the gifted school system is maintained in Vietnam (Huyen, 2020).

This different historical background has led to distinct forms of educational differentiation. As education was suppressed during the Spanish colonial rule, the Philippines implemented the Education Act of 1901 to establishing an efficient school system and focus on expanding and providing educational opportunities (Magallanes, 2018). Vietnamese education has instead promoted educational excellence, making a differentiated education system.

Research descriptive statistics demonstrate that Vietnamese students have high academic scores equivalent to OECD countries. This is in line with previous research that Vietnam has higher academic outcome than other Southeast Asian countries. The scores are similar even to traditionally higher archiving countries such as Singapore and Korea when controlling for individual economic variables (Truong, Hallinger & Sanga, 2017). High achieving scores of Vietnamese students can be related to their enthusiasm for education, especially today it is expressed as the desire to enter prestigious universities.

Both the Philippines and Vietnam have issues with economic inequalities. The Philippines' Gini Coefficient is high (World Bank, 2022a); its economic inequalities persisted since the colonial era and continued after independence

through major failed policies on wealth redistribution (Ventura, 2016). Vietnamese society has also suffered from increased inequality since the Doi Moi Revolution which kept political Communism but adopted economic capitalism by opening up its markets (Sarma, Paul & Wan, 2017).

Although economic inequality does not always parallel with educational inequality (Dupriez & Dumay, 2006), this research found that the Philippines has higher educational inequality than Vietnam; the total effect of family SES on academic achievement is higher in the Philippines compared to Vietnam, controlling for individual covariates. This result implies that family SES is more likely to decide a student's academic outcome and lead to educational inequalities in the Philippines than Vietnam. Therefore, policy makers should attend to high educational inequalities in the Philippines as this can be a factor behind persisting economic inequalities.

Vietnamese also has educational inequalities although in lesser degrees than in the Philippines. The gap in the quality of education exists between urban and rural areas, as well as for marginalized minority ethnic groups (Nguyen et al., 2020). Further research may focus on the effect of ethnicity on the educational inequality of Vietnam.

This dissertation focused on distinct forms of educational differentiation to explain the role of perseverance. In the Philippines, educational excellence is not at the core of the education system, with little consideration for educational differentiation. Therefore, until the end of senior high school, students are not placed in schools based on their academic achievement to not limit their further education career. Although the Philippines also has a science high school system, there are only 16 science high schools across the country. Therefore, most Filipino 15-year-olds in grades 9 or 10 are not subjected to differentiation by academic achievement.

The Vietnamese education system is different, especially at the upper

secondary level. It is well-known that entering a prestigious university in Vietnam is highly competitive. But it is less known that entry into Vietnamese upper secondary school is differentiated by academic achievement. The upper secondary school entrance exam in Vietnam requires two-to-one competition. Students who fail to study at upper secondary schools are either placed in vocational schools or remain lower secondary school graduates. Upper secondary schools are ranked by the university entrance exam results announced by the Vietnamese government. Students with a high score in the upper secondary school entrance exam are more likely to study in prestigious upper secondary schools for high-achieving students—around 10% of all upper secondary schools in Vietnam are for gifted students. Most 15-year-old Vietnamese students are studying in the first year of upper secondary school, differentiated by their previous academic achievements.

The findings on the first research question—the effect of family SES on perseverance—can be interpreted for educational differentiation as follows: the first characteristic of educational differentiation is how parental SES impacts perseverance. As the Philippines has negligible educational differentiation, there is miniscule school effect and room for parents to interfere (Buchmann & Park, 2009; Buchmann & Dalton, 2002). Therefore, this study found the impact of family SES on student perseverance is decisive in the Philippines. However, in Vietnam, 15-year-old students are differentiated, meaning that parental SES has less influence on students' perseverance than do schools. Therefore, Vietnamese students' perseverance is predicted more by school rather than by parental SES. This finding is in line with previous research regarding Filipino parents' involvement on education; Filipino parents are actively involved in providing emotional support and increasing non-cognitive skills rather than supporting activities that require economic capital that they do not have (Garcia, 2018; Jabar, 2020).

However, this family SES effect on perseverance is not the same for all developing countries. In Vietnam, family SES has been decisive in student entrance into specialized or high raking upper secondary schools (Vu, 2011). As the type of school decides one's non-cognitive skills, family SES has little effect on their children's perseverance, which means there are other factors deciding perseverance other than family SES. Therefore, further study should explain factors that affect to children's perseverance. One possible explanation is that the type of school—which is not included in this research as the variable does not exist on PISA 2018—can explain different degree of perseverance in students.

Findings to the second question—the effect of perseverance on academic achievement—can be interpreted as follows. If students are not differentiated by school, as in the Philippines, their opportunities for further education are not limited: they may even study at a prestigious university as long as the students put in much effort (Buchmann & Hannum, 2001; Trautwein et al., 2006). Therefore, perseverance effect on educational achievement is significant in the Philippines. In Vietnam, however, student enrollment in an upper secondary school depends upon entrance exam performance. Furthermore, Vietnamese students are bound in terms of their further educational qualifications regardless of their efforts, resulting in their perseverance being useless in opening up choices in their continuing education. Thus, perseverance does not significantly affect academic achievement in Vietnam. This result is in line with Tran (2022)'s research on constructs of self-efficacy, self-esteem, parent and peer relations that found that non-cognitive skills contribute to reducing dropout rates only in the lower secondary level, while this effect is reduced after entering at the upper secondary.

Lastly, on the third research question—the mediation effect of family SES on academic achievement through perseverance—it was found that the role of perseverance can be different in the process of intergenerational inequalities

transmission. The mediating role of perseverance is only significant in the Philippines where educational differentiation is rarely implemented, but not in Vietnam, where students are placed in stratified schools according to their previous academic achievement. These findings imply that educational inequality is different even in countries with similar cultural and economic backgrounds. This indicates that the mechanism of educational inequalities can differ among developing countries, and requires more research to identify the different educational contexts of developing countries (Buchmann & Hannum, 2001).

This research discusses the research results with educational differentiation, but there is possibility that other factors contribute in the cases of the Philippines and Vietnam. First, a major difference between these two countries is the political system in which the Filipino system is a democracy and the Vietnamese government is based on Communism. If the political system is shaping educational differentiation of the two countries, it would be a major contributor leading to different research findings. However, political systems do not seem to be significantly related to educational differentiation. For example, when East Germany was a socialist regime, it had a comprehensive school system in pursuit of equality, while the West German system was stratified with academic and vocational schools. East Asian countries such as Taiwan and Hong Kong have high school differentiation in terms of academic and vocational track or school reputation regardless of the political system.

While educational differentiation is established regardless of the political system, it can be argued that the political system can impact family SES's effect on perseverance. Vietnam is a more equal society due to Communism, making family SES's effect on perseverance insignificant. Perseverance of Filipino students is influenced by family SES as the Philippines is a capitalistic society. But this factor is complicated by two points. First, research findings showed that

variation of family wealth between the two countries is not much different, which means Vietnam is not as equal a society as expected under Communism. This is because the variation of SES widened after adopting the capitalist economic system through Doi Moi (Sarma, Paul & Wan, 2017). Second, if Vietnam is an equal society, it is reasonable to assume that the effect of perseverance on academic achievement would be larger, because rewarding according to the degree of perseverance is a working mechanism in an equal society. However, this was not the case, and the political system fails to explain the research findings.

Furthermore, one of the unique characteristics of the Vietnamese education system is extreme competition for entrance into prestigious universities (Nguyen, 2012). In contrast, entering a prestigious university is not much of a feature for Filipino students. If the degree of competitiveness can influence to the role of perseverance, it is reasonable to assume that perseverance would be more important in Vietnam than the Philippines. Perseverance is emphasized in Vietnam as a way to achieve high grades, so this perseverance would significantly affect academic achievement. However, these assumptions are not in line with the research findings, meaning that high competition is less likely to be related to the effect of perseverance.

Finally, it can be argued that private schools in the Philippines are another form of school differentiation that can be comparable with Vietnamese school differentiation. However, this form of differentiation needs to be distinguished from the Vietnamese system. In the Philippines, private schools see higher academic results than public schools (Trinidad, 2020), but the choice of private schools is not limited by academic grades but rather by parental SES (Yamauchi, 2005). Therefore, private schooling does not guarantee or increase the possibility of entering a prestigious university, which is an important characteristic of educational differentiation in Vietnam. Furthermore, private schools are not

comparable with Vietnamese school differentiation, as it is easy to change from private to public schools or vice-versa. Previous research shows that students in private schools in the Philippines tend to move to public schools when a public school is available around their area (Jimenez & Sawada, 2001). Also, students easily move to public schools when parents have economic difficulty: during the pandemic half of the private school students transferred to public schools (Balinbin, 2022). Therefore, the different role of perseverance is likely to stem from educational differentiation.

This research does not illustrate which country's educational system is more equitable or inequitable, but more to demonstrate the different educational inequality mechanisms between the Philippines and Vietnam. Vietnam's education system can be considered unequal as students are differentiated at the age of 15. However, the Philippines has a different mechanism of transmitting inequalities with perseverance instead. Therefore, this study cannot conclude which educational system is more equitable; each country has different educational inequality mechanisms depending on the context. Therefore, a single approach to educational inequality should be avoided but multiple approaches are needed to be considered for policy implementation.

The characteristics of educational differentiation can be extended to further studies. High educational differentiation is important in that students' further educational qualifications and occupations are decided for them. Therefore, a student in a highly differentiated education system rarely has the chance to change their course. In contrast, a student in a comprehensive school has more room, as they can choose their future qualification and occupation, as demonstrated by this research. This logic is also evident in other studies, not limited to non-cognitive skills. Choi's (2015) study compared Taiwan and South Korea as two reference countries with distinct high school differentiation. It was discovered that private tutoring predicts academic achievement in middle school

in both countries, but the effect of private tutoring disappears for Taiwanese secondary school students, as their schools are already stratified and leave no opportunity for intervention by private tutoring.

Further research on non-cognitive skills including grit is also needed to consider the dissertation findings. Existing literature on grit explains its impact on academic achievement, but they rarely focus on the institutional context such as educational differentiation. This study demonstrates that educational differentiation is a crucial factor in determining the role of perseverance, and therefore must be considered in future studies on girt and non-cognitive skills.

5.2.2 Non-Cognitive Skills as Emotional Capital

The second contribution of this research is the provision of a new theoretical framework for non-cognitive skills, including perseverance and grit. In the field of sociology of education, educational inequality is a major topic of research, and it has been shown that education contributes to intergenerational transmission of SES (Blau & Duncan, 1967). As educational qualification is strongly influenced by family SES, scholars explained that children with high SES parents tend to have higher academic achievement and educational qualifications than children with low SES parents. Many forms of capital have been suggested to explain the reason for the effect of family SES on their children's academic achievement. Cultural capital—enjoying highbrow cultural experiences—was suggested by Bourdieu (1986), and social capital—emotional bonding with parents and communities—has also been suggested. In addition, parents invest much money in their children's education, such as private schooling or private tutoring, requiring financial capital (Gruijters & Behrman, 2020; Montt, 2011).

Although these studies illustrate a variety of types of capital and extra effort into education, they did not pay much attention to non-cognitive skills in the

intergenerational transmission of educational inequality, except for Nowotny (1981). Nowotny (1981) first conceptualized emotional capital in the context of 1980s Austria, stating that capital accumulated before marriage is transmitted to children through parenting. This emotional capital is not limited to women but can also be attributed to men, and responsibility and individualism have been suggested as the emotional capital that middle-class parents have and actively transmit to their children (Allatt, 1993).

In addition, the concept of emotional capital can be connected to Lareau's (2011) research, *Unequal Childhood*. Lareau shows the difference in parenting style between "contested parenting" by the middle class and "nature parenting" by the labor class. Middle-class parents are actively involved in their children's lives, not only in education-related matters but also in communicating with teachers and forming a social network. Duckworth (2016) insists that perseverance can be increased through parental involvement. Although Lareau (2011) did not directly explore how parenting increases perseverance, there appears to be a relationship between the middle-class parenting style and children's perseverance.

Therefore, this dissertation suggested that perseverance can be included as one kind of emotional capital. In the Philippines, perseverance is not only influenced by family SES but also mediates the impact of family SES on academic achievement. The research results show that perseverance mediates 8% of family SES impact on academic achievement in the Philippines. This research result is consistent with studies by Kwon (2021) and Claro et al. (2016) which also showed that family SES affects non-cognitive skills. Therefore, looking at non-cognitive skills without a sociological perspective and emphasizing non-cognitive skills as teachable traits are not enough to show the attributes of non-cognitive skills. The concept of emotional capital is needed to demonstrate the entire components of non-cognitive skills. Also, there is opportunity for further

research on why family SES contributes to the perseverance of children.

5.2.3 Beyond the Logic of Meritocracy

The discussion of meritocracy has surged recently, which put much emphasis on the effort of individuals, elevating grit as a critical virtue in society (Gorski, 2016; Tierney & Almeida, 2017). Although the concept of meritocracy was first suggested in the 1950s by Michael Young (1958) in his book, *The Rise of Meritocracy*, meritocracy has become an established system in modern society. Meritocracy is defined as a social system in which an individual is compensated for one's ability and effort in a justifiable way. Education is necessary to sustain the meritocratic society, as educational attainment can provide criteria for compensation by demonstrating the individual's qualification. The meritocracy has become a part of modern society and underlies the characteristics of the current culture.

The existence of high stakes standardized testing shows that meritocracy is widespread today (Au, 2015). Standardized testing has become popular for university entrance worldwide, and assessments such as PISA and TIMSS are conducted internationally, hosted by international organizations to measure global academic achievement (Au, 2015). In addition, high stakes standardized testing has become important in the US and has been described as *shifting meritocracy* (Alon & Tienda, 2007). American universities raised the bar for admission with a standardized test and increased the tuition fee on the assumption that making admission difficult would increase the level of excellence of the university. Due to this trend, it has become difficult to implement affirmative action, screening for race and social status (Alon & Tienda, 2007). In a meritocratic society, it is taken for granted that people with high scores on standardized tests are well qualified for a prestigious university, which will help them accumulate wealth and reputation (Sandel, 2020).

However, this dissertation attempts to challenge the widespread valuation of meritocracy by illustrating that perseverance can be shaped by structural and institutional factors. This is in line with concerns that many scholars raised about how naturalization of inequality is justified through meritocratic logic (Ball, 2003). Also, this naturalization is named Meritocracy 2.0 that inherited from IQ testing, the first type of standardized testing that was used to justify racism (Au, 2015). The myth of meritocracy (Sandel, 2020), which neutralizes inequality by criticizing lack of hard work and effort has already been criticized. Therefore, it is necessary to reconsider placing meritocracy as a central virtue of society.

5.2.4 Research on Education in Developing Countries: Beyond Equal Access to Education

The last contribution of this research is in the field of international education. As explained in Chapter 2.1, many studies on international education focused on equal access to education (King, 2005, 2009), ignoring educational inequality pertaining to academic achievement.

This dissertation demonstrates that not only inequality in educational opportunities between countries but also educational inequality within countries is important in developing countries. Furthermore, these results imply that the frequently used human capital approach is not enough to explore education in developing countries. Instead, the research results suggest that a sociological approach is needed to thoroughly explore education in developing countries, as there are many dynamics at work in educational inequality.

This is in line with Chambers's emphasis (1995) on the psychological aspect of poverty. Poverty raises emotional numbness, but this dimension is often neglected in the current international development field. This neglect prevails in international education as well, as psychology studies focus on wealthier Western countries rather than the developing countries. This research contributes to

studies on non-cognitive skills in developing countries.

5.3 Conclusion

This research explored the mechanism of educational inequalities in the Philippines and Vietnam focusing on perseverance and educational differentiation. Even though inequality issues are often featured in Southeast Asia, there have been little attention on educational inequalities. More often the issue is on increasing access to education instead as this is matched by international education agenda. This research is an attempt to fill the gap in research on educational inequality in developing countries. As a mediating factor, perseverance was identified as a non-cognitive skill influencing academic achievement, especially in developing countries where parents lack economic capital to invest in their children's education. The Philippines and Vietnam were chosen for the research to show distinct effect of educational differentiation. This dissertation explored the role of perseverance in the Philippines and Vietnam in educational inequalities.

In Chapter II, the previous literature was analyzed. The first section explained how research on educational inequalities related to sociology of education and international education has been conducted in developing countries. In the second section, the education systems and inequalities in the Philippines and Vietnam were analyzed. In the third section, grit literature was reviewed. Mixed results regarding grit's impact on academic achievement were found, implying that omitted variable bias can exist or country context can intervene to produce mixed results. Furthermore, emotional capital was suggested as a new theoretical concept for perseverance to include sociological aspects. In the last section, educational differentiation—related to educational inequalities—was explored, which helped to postulate the research results.

Chapters III and IV explained the research methodology and findings.

MGCFA and fixed-effects regression methodologies were applied to answer the research questions. The first research finding—the impact of family SES on academic achievement—was different in the two countries: the family SES impact was significant on Filipino students and little or insignificant on Vietnamese students. The second finding demonstrated the impact of perseverance on academic achievement: the effect of perseverance was significant in the Philippines but not in Vietnam. Finally, the mediation effect of perseverance was tested in educational inequalities. The results demonstrated that the mediation effect was significant in the Philippines.

In Chapter V, the research results and contribution of the research were discussed. Educational differentiation intervenes in the role of non-cognitive skills in educational inequalities. The Philippine educational system has maximized the impact of parental SES on student perseverance by putting students in heterogeneous schools. However, the Vietnamese education system has minimized the impact of parental SES with maximized school intervention in constructing perseverance. In addition, delayed educational differentiation made the perseverance effect significant in Filipino students who can improve their educational performance through effort. In contrast, Vietnamese students were limited by the name of their upper secondary school. As a result, the role of perseverance in educational inequalities was found to be significant in the Philippines but not in Vietnam.

This dissertation intended to provide new insight into educational inequality in developing countries. At the same time, it suggests further research on non-cognitive skills related to educational inequalities and institutional contexts. This study is focused on Southeast Asian countries, so other country contexts need to be considered in further research. In addition, this research uses a horizontal dataset, but the association related to non-cognitive skills can be more precisely described by using longitudinal data collected before and after educational

differentiation.

With international commitment and effort, many developing countries have achieved universal primary education. However, how education can transmit intergenerational inequalities is underestimated. This research has contributed by explaining the mechanism of intergenerational transmission of inequality, but more research on educational inequalities in developing countries are need to provide better education for all.

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APPENDIX

A. Analysis with all 10 plausible variables for each subject.

1. Fixed-Effects Regression Results of 10 Plausible Values of Reading Achievement.

	Philippines		Vietnam	
	B	SE	B	SE
Independent variable				
Perseverance [a]	11.211***	0.919	1.142	1.189
Control variables				
Family SES [a]	10.418***	0.929	9.153***	1.149
Parental support [a]	4.919***	0.8224	-0.177	1.149
Female (=1)	13.111***	1.465	8.308***	1.941
Immigration status (=1)	-26.090***	7.2415	-26.019	36.014
Grade (Philippines ref-grade 7, Vietnam ref-grade 9)				
Grade 8	7.287	4.194	-	-
Grade 9	34.709***	3.753376	-	-
Grade 10	58.85643***	3.925405	27.894***	29.341
Reading hours	10.65276***	.8518442	6.476***	1.145
School dummies	yes		yes	
Intercept	280.532***	3.749436	465.073***	28.070
R^2	0.267		0.034	

Data and Sample: PISA 2018. The Philippines' student *n* = 7,233; Vietnam's student n = 5,377.
Note: [a] These variables are standardized within each country (M = 0, SD = 1). The estimates with robust standard errors are an average of the results across 20 imputed datasets by using Rubin's rule. ****p* < 0.001 (two-tailed tests).

2. Fixed-Effects Regression Results of 10 Plausible Values of Math Achievement.

	Philippines		Vietnam	
	B	SE	B	SE
Independent variable				
Perseverance [a]	12.454***	1.419	1.142	1.189
Control variables				
Family SES [a]	6.286***	1.260	9.154***	1.149
Parental support [a]	6.966***	1.550	-0.177	1.062
Female (=1)	0.413	3.010	9.308***	1.941
Immigration status (=1)	-49.654***	9.695	-26.019	36.014
Grade (Philippines ref-grade 7, Vietnam ref-grade 9)				
Grade 8	15.080**	5.687	-	-
Grade 9	44.002***	5.287	-	-
Grade 10	66.312***	5.032	27.894	29.341
Reading hours	5.542***	0.935	6.476***	1.145
School dummies	yes		yes	
Intercept	299.555***	5.280	465.074***	28.070
R^2	0.230		0.034	

Data and Sample: PISA 2018. The Philippines' student n = 7,233; Vietnam's student n = 5,377.
Note: [a] These variables are standardized within each country (M = 0, SD = 1). The estimates with robust standard errors are an average of the results across 20 imputed datasets by using Rubin's rule. ***p < 0.001, **p < 0.01 (two-tailed tests).

3. Fixed-Effects Regression Results of 10 Plausible Values of Science Achievement.

	Philippines		Vietnam	
	B	SE	B	SE
Independent variable				
Perseverance [a]	9.466***	1.823	1.101	1.102
Control variables				
Family SES [a]	7.687***	1.316	6.166***	1.269
Parental support [a]	4.293***	1.030	-0.615	1.271
Female (=1)	-7.397*	2.979	-5.155*	2.515
Immigration status (=1)	-23.236*	9.930		
Grade (Philippines ref-grade 7, Vietnam ref-grade 9)				
Grade 8	12.369*	5.338	-	-
Grade 9	30.889***	4.445	-	-
Grade 10	51.747***	4.992	68.631	38.802
Reading hours	8.474***	0.813	4.792**	1.705
School dummies	yes		yes	
Intercept	315.265***	4.363	474.691***	37.415
R^2	0.167		0.014	

Data and Sample: PISA 2018. The Philippines' student *n* = 7,233; Vietnam's student n = 5,377.
Note: [a] These variables are standardized within each country (M = 0, SD = 1). The estimates with robust standard errors are an average of the results across 20 imputed datasets by using Rubin's rule. ***$p < 0.001$, **$p < 0.01$, * $p < 0.05$ (two-tailed tests).

국문초록

필리핀과 베트남에서의 계층화된 끈기와 학업성취도: 교육분화를 중심으로

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교육사회학에서 교육불평등과 관련한 연구는 활발히 진행되고 있다. 학부모의 사회경제적 지위가 자녀의 성적에 미치는 영향의 크기로 측정하는 교육불평등의 경험적 연구는 다양한 국가 배경을 바탕으로, 영향의 크기뿐 아니라 메커니즘을 찾는 연구가 진행 중이다. 하지만 개발도상국에 관한 교육불평등 연구는 많은 주목을 받지 못하고 있다. 대표적인 이유로 국제적 활동의 주요 지침이 되는 국제적 의제에서는 초등교육 보편화를 중심에 두고 교육기회의 확대에 집중하고 있기에, 많은 개발도상국의 교육연구 또한 교육기회에 초점을 두고 연구되고 있다. 그러므로 본 연구는 개도국의 교육불평등 연구가 부족함을 포착하여 진행하였다. 개발도상국에서는 가정에서 교육에 투자하는 경제적 자원이 부족하다. 이에 따라 학생의 비인지적 역량(교육참여 동기, 끈기 등)을 길러주는 방법으로 학부모가 자녀의 교육에 개입함에 포착하여, 학생의 끈기가 어떻게 교육불평등을 매개하는지 살피고자 한다.

본 연구는 비교 연구로 필리핀과 베트남을 선정하였다. 동남아시아는 경제불평등이 가속화되고 있는 지역이며, 경제불평등은 교육불평등과 관련이 깊기에 동남아시아 지역에서도 교육불평등의 문제를 충분히 살펴볼 수 있을 것으로 가정하였다. 또한 필리핀과 베트남은 중저소득국이며, 초등교육 보편화를 이루었기에 중등단계에

서의 교육불평등을 살피기에 합당하다고 보았다. 그럼에도 두 국가는 교육분화에서 차이가 있다. 필리핀의 경우 교육분화는 대학교 때 처음 일어나지만, 베트남은 고등학교가 평준화되어 있지 않기에 고등학교 진학하면서 교육분화가 되는 특성이 있다. 즉, 필리핀과 베트남으로 국가를 살피는 것은 교육분화에서는 상반된 형태를 가지고 있어, 개도국 내에서의 교육제도를 비교하기에도 장점을 가진다. 이를 바탕으로 세 개의 연구문제를 설정하였는데 다음과 같다. 1) 필리핀과 베트남에서 가정의 사회경제적 배경은 학생의 끈기의 정도에 영향을 미치는가? 2) 필리핀과 베트남에서 학생의 끈기는 학업성취도에 영향을 미치는가? 3) 필리핀과 베트남에서의 끈기는 가정의 사회경제적 배경이 학업성취에 미치는 영향을 매개하는가?

위 질문에 답하기 위해 PISA 2018 자료를 가지고 다집단 구조방정식 모형과 고정효과분석을 실시하였다. 분석결과, 필리핀에서는 가정의 사회경제적 배경이 학생의 끈기의 정도에 영향을 미치는 것으로 나타났다. 이는 높은 사회경제적 배경의 가정의 학생들이 더 높은 끈기를 가지는 경향이 있음을 의미한다. 하지만 베트남에서는 가정의 사회경제적 배경이 학생들의 끈기의 정도에 영향은 적었다. 끈기가 학업성취에 미치는 영향에 대해서는, 필리핀에서는 높은 끈기를 가진 학생일수록 높은 학업성취를 보였으나, 베트남에서는 유효한 효과가 없었다. 마지막으로 매개효과를 분석하였을 때, 필리핀에서는 끈기가 가정배경과 학업성취를 매개하는 역할을 하였으나, 베트남에서는 유의미하지 않았다. 종합하여 보면 필리핀과 같이 분화가 늦게 되는 특성을 가진 국가에서는 교육불평등에서 끈기의 역할이 중요하나, 분화가 이미 이루어진 베트남에서는 끈기는 교육불평등에서의 역할이 미비하였다.

본 연구는 개도국에서의 교육불평등 메커니즘의 양상을 보임에 의의가 있다. 끈기와 같은 비인지적 역량이 개도국의 교육불평등에서 주요한 메커니즘 역할을 할 것이라 기대하였지만 필리핀과 베트남의 결과는 다르게 나타났다. 필리핀과 같이 분화가 늦게 일어나는 경우에는 끈기가 교육불평등에 기여하지만, 베트남처럼 분화가 이미 일어난 경우에는 끈기가 교육불평등에 매개하는 영향은 미비하였다. 이는 교육분화의 정도가 다른 국가에서 비인지적 역량이 교육불평등에 기여하는 정도가 다를 수 있다는 것을 의미한다. 본 연구는 개도국의 교육 연구가 개도국의 공통점을 부각하고 있기에 개도국 내에서도 교육제도의 형태에 따른 교육불평등 연구가 더 필요함을 시사한다. 또한 능력주의가 사회를 이끄는 강력한 동력이 된 현대 사회에서, 본 연구는 노력을 위한 끈기와 같은 비인지적 역량만을 강조하는 것은 다른 사회구조적, 제

도적인 요소를 놓칠 수 있음을 시사한다. 또한 많은 개발도상국의 연구가 교육접근성에만 집중되어 있는 것을 고려하였을 때, 개발도상국에서의 교육불평등, 비인지적 능력을 포함한 다양한 연구가 필요함을 시사한다.

주요어: 교육불평등, 필리핀, 베트남, 끈기, 비인지적 역량, 학업성취도, 교육분화
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