

Chapter 2

A Review of the Literature on Socioeconomic Status and Educational Achievement



Abstract The foundations of socioeconomic inequities and the educational outcomes of efforts to reduce gaps in socioeconomic status are of great interest to researchers around the world, and narrowing the achievement gap is a common goal for most education systems. This review of the literature focuses on socioeconomic status (SES) and its related constructs, the association between SES and educational achievement, and differences among educational systems, together with changes over time. Commonly-used proxy variables for SES in education research are identified and evaluated, as are the relevant components collected in IEA's Trends in International Mathematics and Science Study (TIMSS). Although the literature always presents a positive association between family SES and student achievement, the magnitude of this relationship is contingent on varying social contexts and education systems. TIMSS data can be used to assess the magnitude of such relationships across countries and explore them over time. Finally, the literature review focuses on two systematic and fundamental macro-level features: the extent of homogeneity between schools, and the degree of centralization of education standards and norms in a society.

Keywords Centralization versus decentralization · Educational inequality · Forms of capital · Homogeneity versus heterogeneity · International large-scale assessment · Student achievement · Socioeconomic status · Trends in International Mathematics and Science Study (TIMSS)

Educational inequality occurs in multiple forms. Van de Wefhorst and Mijs (2010) discussed its existence through the inequality of educational opportunity in terms of the influence of social background on students' test scores, as well as in learning, as expressed by the performance distribution in test scores. According to the authors, these two characteristics of inequality are conceptually different in that an educational system may have equality in terms of dispersion (or variance) in educational achievement but inequality in terms of opportunities; yet, in general,

societies that are equal in terms of dispersion are also more equal in terms of opportunities.

Different education systems take part in each cycle of TIMSS, but 25 education systems took part in the grade eight mathematics student assessment in both 1995 and 2015. For these 25 participating systems, the average mathematics achievement score increased by only five score points between 1995 and 2015 (Mullis et al. 2016). Focusing only on more recent trends, for the 32 education systems that participated in the grade eight mathematics student assessment in both 2011 and 2015, there was a gain of nine scale score points between 2011 and 2015, suggesting that many of the education systems with the largest gains are those starting from a low base. As there is limited information on family and home background and its relationship with TIMSS international achievement, this spread in achievement is not sufficient to explain why education systems perform differently. Therefore, our study focuses on the other aspect of educational inequality, namely how SES background is related to educational achievement. In the next two sections of this chapter, we review the concept and measurement of socioeconomic status, and the literature regarding the relationship between family SES and student academic achievement. The rest of this chapter focuses on differences between the various education systems and changes in educational inequality over time.

2.1 Socioeconomic Status and Related Constructs and Measures

The American Psychological Association (APA) defines socioeconomic status as “the social standing or class of an individual or group” (APA 2018). SES has been commonly used as a latent construct for measuring family background (Bofah and Hannula 2017). However, among empirical studies, there is no consensus on how to best operationalize the concept. In many studies, the measurement of SES does not receive much attention, with very limited discussion over why certain indicators were used rather than others (Bornstein and Bradley 2014). Liberatos et al. (1988) argued that there was no one best measure, because the choice of the SES measure depended on the conceptual relevance, the possible role of social class in the study, the applicability of the measure to the specific populations being studied, the relevance of a measure at the time of study, the reliability and validity of the measure, the number of indicators included, the level of measurement, the simplicity of the measure, and comparability with measures used in other studies.

Historically, SES has been conceptualized and measured in various ways. Taussig (1920) conceptualized SES as the occupational status of the father. Later, Cuff (1934) adopted a score card proposed by Sims (1927) as a measure of SES; this included questions about items possessed by the home, parents’ education, father’s occupation, and other relevant information. Moving on from these early studies, development of instruments for measuring SES has become more complicated,

including more advanced methods such as factor analysis or model-based approaches (NCES [National Center for Educational Statistics] 2012). By the 1980s, one general agreement had emerged: SES should be a composite variable, typically measuring education, income, and occupation, since these three indicators reflect different aspects of family background (Brese and Mirazchiyski 2013).

However, collecting this information is known to be challenging. Besides privacy concerns, there are also concerns about information accuracy (Keeves and Saha 1992). For example, the National Assessment of Educational Progress (NAEP) in the United States does not collect family income or parental occupation directly from students, as many of them are unable to accurately report such data (Musu-Gillette 2016). Similarly, TIMSS decided not to include questions about parental occupation and income because of doubts about the reliability and utility of similar information collected by previous IEA surveys (Buchmann 2002). Therefore, the grade eight student questionnaires for TIMSS include only three proxy components for SES: parental education, books at home, and home possessions (such as ownership of a calculator, computer, study desk, or dictionary), with some evolution in the home possession items over time owing to rapid advancements in technology over the 20 years of TIMSS (more recent items include the internet, or computer tablet, for example).

The abstract nature of the concept of SES leaves some room for researchers to decide what proxy variables to use as SES measures. Yang (2003), for example, found that the possession of a set of household items may be used as SES indicators. Despite variability and limitations in the measurement of SES, its association with student performance has been demonstrated in numerous studies (Sirin 2005).

2.2 Family SES and Student Achievement

Theoretical and empirical work has emphasized that family SES has an impact on children's educational outcomes, examined mechanisms through which family SES is related to children's achievement, and identified potential pathways behind this relationship, one of which uses three forms of capital: economic, cultural, and social capital (Bourdieu 1986; Coleman 1988, 1990). In other words, differences in the availability of these forms of capital¹ across households eventually lead to disparities in children's academic achievement (Buchmann 2002).

Bourdieu (1986) posited that capital can present itself in three fundamental forms and that economic capital is the source of all other forms of capital. The other types of capital are treated as transformed and disguised forms of economic capital. Economic capital can be used in pursuit of other forms of capital; for

¹Note that family socioeconomic status is clearly related to Bourdieu's theory of capital in the empirical world. Conceptually, however, they do not equate with each other.

example, family income can be used to pay for organized after-school activities, to access elite educational opportunities, or to build up valuable social networks (Lareau 2011). Children from disadvantaged backgrounds are constrained by the financial resources they and their family possess (Crosnoe and Cooper 2010). As such, economic capital determines the extent to which parents can offer financial support to children's academic pursuits.

In addition to economic capital, cultural capital, namely knowledge of cultural symbols and ability to decode cultural messages, helps parents transmit their advantages to children and to reproduce social class (Bourdieu 1986). According to Bourdieu (1986), an individual's cultural capital can exist in an embodied state as well as in an objectified state. In the embodied state, cultural capital focuses on "physical capital," where the body itself is a marker of social class, as particular embodied properties exist as a consequence of specific class practices (Tittenbrun 2016). Through this state, inequality in socioeconomic class can find expression in embodied ways, such as physical appearance, body language, diet, pronunciation, and handwriting. In the objectified state, inequality is expressed in forms of cultural goods, such as accessibility to pictures, books, dictionaries, and machines. Therefore, in this view, Bourdieu sees the body and cultural goods as forms of currency that result in the unequal accumulation of material resources and, by extension, represent an important contributor to class inequality (Perks 2012).

Children from higher social classes also have advantages in gaining educational credentials due to their families. Cultural capital is considered an important factor for school success. Yang (2003) suggested possession of cultural resources had the most significant impact on students' mathematics and science achievement in most countries. If cultural resources are differentiated according to family background, and if some cultural resources have more value than others in the education system, it is reasonable to assume that differential achievement is related to an individual's social class (Barone 2006). For example, a student's social ability and language style, as well as attitudes toward the school curriculum and teachers, may differ according to social class origins (Barone 2006). As such, parental school choice in some countries favors children from those families that already possess dominant cultural advantages (i.e., children attending private schools in the United States), thus confirming the cultural inequalities between classes and status groups of families to produce educational inequalities among their children (Shavit and Blossfeld 1993). Lareau (1987, 2011) further posited that middle-class parents have a different parenting style, which she termed concerted cultivation, fostering their child's talent through organized activities, while working-class parents tend to have a natural growth parenting style, letting their children create their own activities with more unstructured time. Consequently, middle-class families prepare their children better for school since their parenting style is more valued and rewarded by the school system.

Finally, the possession of social capital reflects the resources contained in social relations, which can be invested with expected benefits (Bourdieu 1986). Differences in educational success can be attributed to different levels of existing social capital, which is produced in networks and connections of families that the school serves (Rogošić and Baranović 2016). Coleman (1988) developed a

conceptual framework of social capital in which social structure can create social capital, through family, school, and community. The relationships between the family and the community may be used to explain the higher educational achievements of students based on expected achievements with respect to their socioeconomic status (Mikiewicz et al. 2011).

In summary, while the overall association between family SES and students' academic achievement is well documented in theoretical and empirical work, the magnitude of the relationship between family SES and achievement differs across countries. This may be related to differences in education systems and jurisdictions, and societal changes over time.

2.3 Differences in Education Systems and Changes Over Time

In any society, there are two systematic and fundamental macro-level features that highlight the differences in education systems and how they have changed over time. First, is the extent of homogeneity among education systems. Second, is the degree of centralization of education standards and norms in a society. The association between family background and children's achievement depends on the education system and the social context (i.e., the level of homogeneity and centralization). Where educational inequality is prominent, students from different backgrounds may demonstrate larger achievement gaps.

2.3.1 Homogeneous Versus Heterogeneous

Previous research has shown that students at lower levels of SES perform better in education systems with lower levels of inequality than their counterparts in countries with more significant SES differences (Ornstein 2010). That is, some education systems are more homogeneous than others, with schools being more similar to each other in terms of funding. As an example, Finnish households have a narrow distribution of economic and social status at the population level and their schools show little variation in terms of funding (Mostafa 2011).

Furthermore, Mostafa (2011) found that school homogeneity on a large scale is a source of equality since it diminishes the impact of school characteristics on performance scores. Finland is often seen as an example of a homogeneous education system with high levels of similarity between schools, which in turn reduces the impact of school variables on performance scores (Kell and Kell 2010; Mostafa 2011). More specifically, Montt (2011) examined more than 50 school systems, including Finland, in the 2006 cycle of PISA and found that greater homogeneity in teacher quality decreased variability in opportunities to learn within school systems, potentially mitigating educational inequality in achievement.

By contrast, Hong Kong has a relatively high-income disparity compared to other societies (Hong Kong Economy 2010). However, the relationship between socioeconomic status and mathematics achievement was found to be the lowest among the education systems participating in the 2012 cycle of PISA (Ho 2010; Kalaycioğlu 2015). This suggests that, despite diversity in their SES background, most students from Hong Kong access and benefit from the education system equally. Hong Kong's high performance in reading, mathematics, and science also suggests the average basic education is of high quality (Ho 2010).

However, in many other countries with heterogeneous education systems, educational inequality has manifested itself primarily through the stratification of schools on the basis of socioeconomic composition, resource allocation, or locale. For example, unlike schooling in many other countries, public schooling policies in the United States are highly localized. Local property taxes partially finance public schools, school assignments for students depend on their local residence, and neighborhoods are often divided by racial and socioeconomic background (Echenique et al. 2006; Iceland and Wilkes 2006). Cheema and Galluzzo (2013) confirmed the persistence of gender, racial, and socioeconomic gaps in mathematics achievement in the United States using PISA data from its 2003 cycle. Inequalities in children's academic outcomes in the United States are substantial, as children begin school on unequal terms and differences accumulate as they get older (Lareau 2011; Lee and Burkam 2002).

In Lithuania, there has also been a growing awareness that an ineffectively organized or poorly functioning system of formal youth education increases the social and economic divide and the social exclusion of certain groups (Gudynas 2003). To ensure the accessibility and quality of educational services in Lithuania, special attention has traditionally been paid to a student's residential location. Gudynas (2003) suggested that the achievement of pupils in rural schools in Lithuania was lower than that of pupils in urban schools, with the difference being largely explained by the level of parental education in rural areas, which was on average lower than that of urban parents. Similarly, in New Zealand, residential location is considered to be a barrier to educational equality. Kennedy (2015) observed that students residing in rural residential areas on average tend to have lower SES than those in urban areas, and receive a considerably shorter education than their counterparts living in urban centers, thereby promoting SES disparities in access to education.

In the Russian Federation, Kliucharev and Kofanova (2005) noted that the inequality between well-off and low-income individuals regarding access to education has been increasing since the turn of the century. According to Kosaretsky et al. (2016), the greatest inequality in educational access in the Russian Federation was observed in the 1990s, where the rising number of educational inequalities was largely determined by the accelerating socioeconomic stratification of the population, as well as significant budget cuts to education. Although the state articulated policies aiming for universal equality of educational opportunities, they argued that the policies were not implemented with the required

financial and organizational support. As a result, in the immediate post-Soviet era, the Russian Federation has observed increasing educational inequality and some loss of achievement compared to the Soviet period.

A final example is Hungary. Horn et al. (2006) noted that OECD's PISA studies in the early 2000s highlighted the need for the Hungarian school system to improve both in effectiveness and equality. They contended that achievement gaps among schools make the Hungarian education system one of the most unequal among the participating countries in the PISA 2000 and 2003 cycles. The variation in performance between schools in Hungary is alarmingly large, about twice the OECD average between-school variance (OECD 2004). By contrast, the within-school variance is less pronounced, suggesting that students tend to be grouped in schools with others sharing similar characteristics. In other words, students' achievement gaps seemingly mirror the differences in socioeconomic backgrounds of students across different schools (OECD 2001, 2004). In recent years, persistent education performance gaps with regard to socioeconomic background of students have been observed in Hungary, with 23% of the variation in students' mathematics performance being explained by differences in their SES background, well above the average of 15% for OECD countries (OECD 2015).

2.3.2 Centralized Versus Decentralized

In addition to differences in homogeneity, education systems can be classified as centralized or decentralized. A centralized education system is one that would have centralized education funding (e.g., at the national level) across the education system with little local autonomy, while in decentralized education systems, municipalities oversee school funding for both public and private schools (Böhlmark and Lindahl 2008; Oppedisano and Turati 2015). Centralization generally leads to the standardization of curriculum, instruction, and central examinations in an education system, and can be helpful in reducing inequalities since it mitigates the influence of a student's family background (Van de Wefhorst and Mijs 2010). By contrast, high levels of decentralization can create greater disparities between schools, especially when the level of funding is determined by the local context (Mostafa 2011).

Sweden is an example of a decentralized education system that was centralized until the implementation of wide-reaching reforms in the early 1990s (Hansen et al. 2011). The previously centralized Swedish school system has been thoroughly transformed into a highly decentralized and deregulated one, with a growing number of independent schools and parental autonomy in school choice (Björklund et al. 2005). Concurrently, examining multi-level effects of SES on reading achievement using data from IEA's Reading Literacy Study from 1991 and PIRLS data from 1991 to 2001, the SES effect appears to have increased in Sweden over time, with between-school differences being greater in 2001 than in 1991, suggesting school SES has a strong effect (Hansen et al. 2011).

Similarly, there has also been growing debate about educational inequality in the Republic of Korea in recent years. By analyzing grade eight TIMSS data from the

1999, 2003, and 2007 cycles of the assessment, Byun and Kim (2010) found the contribution of SES background on student achievement had increased over time. They suspected the higher educational inequality might be related to various factors, including a widening income gap and recent educational reforms geared toward school choice, as well as increased streaming by academic ability and curriculum differentiation created by a decentralized education system.

Researchers have found evidence to support the view that decentralized education systems in developed countries perform better than centralized systems in terms of reducing students' achievement inequality (see, e.g., Rodríguez-Pose and Ezcurra 2010). Conversely, Causa and Chapuis (2009) used PISA data for the OECD countries to confirm that decentralized school systems were positively associated with equity in educational achievement. Furthermore, according to PISA 2000 and 2006, in European countries inequality in educational outcomes has apparently declined in decentralized school systems, while it has concomitantly increased in centralized systems (Oppedisano and Turati 2015).

Mullis et al. (2016) argued that efficiency and equality can work together. They found that many countries have improved their TIMSS national averages while also reducing the achievement gap between low- and high-performing students. Similarly, an analysis using TIMSS scores from 1999 and 2007 discovered a prominent inverse relation between the within-country dispersion of scores and the average TIMSS performance by country (Freeman et al. 2010; Mullis et al. 2016). The pursuit of educational equality does not have to be attained at the expense of equity and efficiency.

In conclusion, the positive association between family background and children's achievement is universal. However, the magnitude of such associations depend on the social context and education system. In other words, the achievement gap between students from different backgrounds is more pronounced in education systems where overall inequality (e.g., income inequality) is strong. Narrowing the achievement gap is a common goal for most education systems. But it is well understood that stagnant scores for low-SES students and declines in the scores of high-SES students should not be seen as an avenue for enhancing equality. Rather, education systems should strive for equality by improving the performance of all students while focusing on improving the achievement of low-SES students at a faster rate to reduce gaps in achievement (Mullis et al. 2016). In recognition of this, our study not only focuses on how inequalities in educational outcomes relate to socioeconomic status over time for select participating education systems in TIMSS but also tracks the performance of low-SES*² students separately. In order to make a comparable trend analysis, we first constructed a consistent measure of family SES* based on a modified version of the TIMSS HER. Chapter 3 describes the data and

²The SES measure used in this study is a modified version of the TIMSS home educational resources (HER) index and does not represent the full SES construct, as usually defined by parental education, family income, and parental occupation. In this report, we therefore term our measure SES* to denote the conceptual difference (Please refer to Chap. 1 for more details).

methods used in the study and Chap. 4 presents the trends in SES* achievement gaps of the 13 education systems that participated in three cycles of TIMSS, including the 1995 and 2015 cycles.

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