

THE ROLE OF SCHOOL MIGRANT
COMPOSITION IN MIGRANT
STUDENTS' SCHOOL-RELATED
WELL-BEING

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Doctor of Philosophy

by
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The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

THE ROLE OF SCHOOL MIGRANT
COMPOSITION IN MIGRANT
STUDENTS' SCHOOL-RELATED
WELL-BEING

presented by Xinyi Mao,

a candidate for the degree of doctor of philosophy,

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ABSTRACT

Over the past few decades, internal migration in China has resulted in equity issues related to educational opportunities for migrant children. In an effort to provide equal schooling opportunities for migrant students, since 2001, the Chinese central government has implemented a series of policies to integrate migrant students into public schools. However, local governments were found to be implementing these policies in different ways, and the enrollment rates of migrant students in public schools varied from place to place. Existing research has largely investigated migrant children's educational outcomes, such as academic achievement. However, limited research to date has explored migrant students' well-being, which is considered an important outcome in recent decades by scholars from both within and outside China. This dissertation examines the urban-migrant gap in student well-being, specifically in mental health, sense of belonging, and school bullying victimization experience. Further, the study examines the role of school migrant composition in influencing the urban-migrant student well-being gap. This study utilized the China dataset of the Program for International Student Assessment (PISA) 2018, which contained 11,989 15-year-old participants from 361 middle schools, representing approximately 992,302 15-year-old students in Beijing, Shanghai, Jiangsu, and Zhejiang in China. The study utilized two-level hierarchical linear modeling (HLM) with appropriate student and school weights as the analytical method. Findings showed that migrant students had lower well-being than their urban peers in mental health, sense of belonging to schools, and school bullying victimization experience. Further, the school composition of migrant students is associated with the migrant-urban well-being gap. In particular, the school migrant composition significantly accounted for the between-school variation of migrant-

urban well-being gaps in student mental health; migrant students reported lower levels of mental health in schools with a higher proportion of migrant students. However, migrant students were found to have a higher sense of belonging when enrolling in schools with a higher proportion of migrant peers, relative to the migrant-urban gap in the sense of belonging for a typical school. The present study motivates the need for more attention on migrant students' school experience, alongside their academic outcomes. The different directions of how migrant composition relates to migrant students' mental health and school belongings raise the importance of considering school composition as an important factor in examining migrant education. As the number of migrant children arriving in urban centers continues to increase alongside China's economic development, policymakers and educational leaders should consider providing specific and targeted mental health services for migrant students; creating an inclusive public-school environment where migrant students feel connected and integrated; and enhancing necessary mental health resources for migrant students.

Keywords: migrant children; well-being gap; proportion of migrants, PISA

Chapter 1 Introduction

As the world becomes increasingly interconnected, migration has become an essential aspect of social and economic development in the United States and Western Europe (Willekens et al., 2016; Woetzel et al., 2016). Based on the estimation from the United Nations, in 2020, there were 272 million migrants globally, which consisted of 3.5% of the entire world's population (Edmond, 2020). The word *migrant* has often been used as an umbrella term, referring to people who move away from their place of usual residence within a country or across countries for a variety of reasons, such as moving for job opportunities or education (Gibson & Carrasco, 2009). As an essential component of globalization, the developing world has also witnessed continuously expanding internal migration flows—in China, there has been a surge of internal migrants moving from less developed regions to economically developed large urban cities (Cao et al., 2018). People migrate from inner cities or rural areas, such as Sichuan, Henan, Anhui provinces, to large, urban cities located in the eastern coastal areas (Wang & Murie, 2000; Wong et al., 2006). The driving forces behind this migration include surplus labor in agriculture (Roberts, 2000), urban-rural income disparity (Zhang & Song, 2003), the emergence of private enterprises in urban cities (Iredale et al., 2001), and relatively high-paid job opportunities in large cities compared to agricultural work (Goodburn, 2009). After relocating, migrant people often work in private sectors or hold jobs in factories and service industries, such as restaurant employees in cities. These jobs usually require very low or no education qualifications (Wong et al., 2006). As a result, large cities such as Beijing, Shanghai, Guangdong, and Zhejiang have become popular cities for migrant people to relocate.

According to the National Census data of China, in 2019, more than 290 million workers migrated from rural areas to urban cities (China Statistical Yearbook, 2019); approximately 35.8 million were school-aged children (T. Liu et al., 2020). China is a multi-ethnic and multicultural country—approximately 114 million people are of ethnic minority heritage, accounting for 8.5% of the overall population (National Bureau of Statistics of the People’s Republic of China, 2011). The large number of migrants has resulted in increasingly heterogeneous school environments in urban cities, which has the potential to shape the educational experience of both migrant and urban students (Gonzales, 2010; Gu & Yeung, 2020). In some economically developed regions, migrant students constitute a considerable proportion of the share of school-aged children—for instance, 36.28% in Beijing, 43.1% in Guangzhou, 46% in Shanghai municipality, and 48% in Zhejiang province (T. Liu et al., 2015). The large number of migrant students in urban cities has been attracting growing attention in educational research, and various issues related to migrant education have also been reported in global newspaper headlines from time to time (French, 2007; Hernández & Zhao, 2017). Scholars from both within and outside China have expressed concerns about the educational opportunities of migrant students and examined whether migrant students enjoy equal schooling experiences compared to their residential peers in host cities (Donzuso, 2015; D. Li, 2020). As a result, the education of migrant children is a policy issue of great importance in China (Holdaway, 2018), and the promotion of migrant students’ school experience has become a top priority in China’s educational policy (Chen & Feng, 2019).

Background: Education policies and migrant children in China

As one way to provide equal educational opportunities to all citizens, the Chinese

government issued the *Compulsory Education Law* in 1986, which regulated that all citizens in China be entitled to a nine-year mandatory education, including six years of primary school education and a 3-year junior middle school education (H. Fang et al., 2012; Y. Liang & Dong, 2019). However, migrant students in China are by no means guaranteed enrollment in public schools because the compulsory education system is built on the household registration system, also known as *hukou* in China (W. Liang et al., 2019). Established in the 1950s by the Chinese government, the hukou system is one of the most influential policies that are still present (Guo & Zhao, 2019). Under the regulation of the hukou system, all Chinese citizens are tied to their place of residence both geographically and in the social welfare system, and the hukou is hereditary in nature whereby children inherit hukou status from their parents (Montgomery, 2012). In order to enroll in public schools, students must meet two criteria: first, students must reside within the local school district boundary; second, students must be registered in the school district by having a local hukou (Y. Chen & Feng, 2013). In other words, submitting proof of hukou status is a legal process in public school applications and enrollment for students in China. The reasoning behind these regulations is that the funding for education in China is allocated through local governments at the city or district level and is not portable across districts (Chen, 2012). Therefore, migrant students are sometimes considered as an extra burden for districts in their host city (Wang & Holland, 2011).

For migrant children who cannot attend public schools, they have to attend migrant-specific schools that are often unregulated and suffer from teacher shortages and insufficient school resources (Y. Chen & Feng, 2013; Smith & Joshi, 2016). Migrant schools are typically established by migrant entrepreneurs and often hire retired teachers or

college students as volunteer teachers regardless of their subject-matter expertise (Li et al., 2010). Although migrant-specific schools are quite affordable for migrant families, they are subject to constant closures and changes of location as these schools do not have a clear legal standing within China's legal educational system (Han, 2004; Wan, 2021). Migrant schools and their students are considered as "not in the system" in China (Chen & Feng, 2012, p. 7). Specifically, students from migrant-specific schools do not enjoy the same educational opportunities, such as state-level awards, competitions, and opportunities in the college entrance examination, compared to their peers in public schools (Wang, 2020). The discrimination that migrant children have faced in public education has been criticized by mass media outlets both within and outside China (Hernández & Zhao, 2017; Song, 2019; Xia, 2006) and has raised concerns from many educational researchers (Guo & Zhao, 2019; Montgomery, 2012).

To address the issue of migrant students in public education, the Chinese government has implemented a series of policies starting from 2001 to ensure that *all* students can enroll in public schools (T. Liu & Laura, 2018). Specifically, in 2010, the Ministry of Education implemented the *Outline of China's National Plan for Medium and Long-Term Education Reform and Development* (hereafter called *Outline*), which enhanced migrant children's free access to public schools in their host cities (Ministry of Education, 2010). While the official educational policy in China continues to promote inclusive public education, the hukou system works as an administrative barrier for migrant students to enroll in public schools. Specifically, migrant families are required to submit a series of documents before sending their children into public schools—for example, in Beijing, migrant children need at least five documents of proof, including proof of actual residency

in Beijing, proof of guardians' employment in Beijing, household registration permit issued by the government, tax slips, and other supplementary materials (W. Liang et al., 2019). The five licenses requirement is believed to be quite strict and particularly unfavorable to migrant children with meager socioeconomic status. Migrant workers, especially low-skilled laborers and their families were expected to leave large cities under this initiative (Wen & Hanley, 2016). A school principal in Beijing mentioned that at least one of the documents—the proof of residency—is almost impossible for migrant parents to obtain on their own (Ming, 2014). Since 2014, large cities such as Shanghai, Guangzhou, and Shenzhen have implemented similar initiatives (Liu et al., 2018; Wang, 2014).

In addition to the hukou system, migrant families face school-imposed barriers when enrolling their children in public schools (Lu & Zhou, 2013). Specifically, migrant students are admitted to public schools only if the schools have space for additional students or when migrant families can afford a lump sum of enrollment fees (D. Li, 2020; Z. Liang et al., 2020). Lu and Zhou (2011) reported that the enrollment fees could be as high as 30,000 Chinese dollars (yuan), up to six times that resident families pay for educational expenses. In other words, only migrant families who can afford these expenses can have their children enrolled in public schools. Additionally, migrant students need family capital resources, particularly personal connections (*guanxi*¹) with local residents and information networks, to know which public schools have better quality (Yiu, 2020). As mentioned by Yiu (2020), within the migrant student population, those with higher socioeconomic status

¹ *Guanxi* is the Chinese expression of personalized social relations. It refers to a network of informal interpersonal relationships and exchanges of favors.

are more likely to enroll in schools in central districts or high-quality public schools; students from low-income families tend to enroll in low-quality public schools. Moreover, school resources are not equally distributed in the public school system as the quality of facilities including the number of teachers and teacher quality is highly correlated with the average socioeconomic status of the districts in which schools are located (Liu et al., 2020). Considering the fact that migrant people are excluded from the social welfare system and cannot receive housing subsidies in urban cities, they tend to live in segregated communities with fewer local residents (Lu & Zhou, 2013). According to Xu and Wu (2022), schools in such districts typically have fewer resources, such as the availability of after-class activities; further, more of their students may come from low socioeconomic status families and have poor academic records. Consequently, even within the public school system, migrant students are disproportionately sorted into low-quality schools, contributing to a sizeable educational gap between migrant and local students.

In brief, several factors are related to migrant students' enrollment in public schools in China, including but not limited to the requirement of necessary documents (W. Liang et al., 2019), the recruitment standards, and the availability of spots in public schools (W. Liang et al., 2019), and the socioeconomic status of the migrant family (Lu & Zhou, 2011). As a result, the number of migrant students enrolled in public schools varies from place to place—while some places have around 80% of migrant students enrolled in public schools, cities such as Beijing are found to have only 20% of migrant students enrolled in the public school system (Ren & Yang, 2011). In other words, there is wide variability between cities in the proportion of migrant children enrolled in public schools and migrant-specific schools (Z. Liang et al., 2020). Despite the central government's effort to include migrant

students in the public school system, there is often a decoupling of policy and reality, especially in large urban cities. Specifically, the central government has not passed any permanent law that would hold local governments accountable for educating all children regardless of their hukou status (Goodburn, 2009). Therefore, the local government, by claiming that they possess insufficient public education resources and limited enrolling capacity, has considerable powers to decide whether and how to include migrant students in public education (Xia, 2006). Although previous educational policies have initiated a more equitable public school system for all students, it is undeniable that the current hukou system still exposes migrant students to disadvantages in public education and will continue to be a challenge for migrant families (OECD, 2016).

Further, in contemporary China, an individual's hukou status becomes a key marker of social identity (D. Zhang & Luo, 2016). Terms such as “invisible walls” and “two-class society” have been used to describe how hukou has bifurcated China's population into privileged residents with hukou in large urban cities and the underprivileged groups with hukou from rural areas or inner cities (Chan & Zhang, 1999). Having a hukou in large urban cities such as Shanghai or Beijing confers economic benefits such as preferential access to public schools, prestigious occupations, and state-subsidized welfare benefits (Fan, 2020). However, individuals without a local urban hukou are often treated as “second-class” as hukou status is permeable in almost all social interactions; for example, Xue (2018) notes that local urban landlords are reluctant to rent their apartments to migrant workers who relocate to the city, and some local residents do not take a taxi if the driver is a migrant worker. Hukou intermarriage, which is the marriage between individuals with hukou from an urban area and a rural or small city, is also rare. Less than one-third of

marriages in China are hukou intermarriages, and people with an urban hukou but married to someone from a hukou in rural or small cities are often described as “married down” (Lui, 2016, p.3). In Shanghai, even kindergartens screen for children’s hukou registration based on the assumption that children with a local hukou enjoy a more stable learning environment and better family resources than migrants (Li, 2020). An individual’s hukou status persists as an invisible factor in Chinese people’s social life.

Qian and Walker (2015) noted that within the public school system, there are also stereotypes related to students’ hukou status—schools that enroll large numbers of migrant children are often labeled as “street-market schools” (p.78) due to a perception or stereotype that migrant children spend their pre-school years in street markets while their local peers are sent to formal kindergartens. Scholars have reported that migrant students are less healthy, receive lower standardized scores on cognitive testing, and are more likely to be late for class than local students (H. Wang et al., 2018). Parents with better socioeconomic status often make extra efforts to enroll their children in schools with lower ratios of migrant students (Y. Chen & Feng, 2017). Li and Placier (2015) reported that some urban parents openly demand that schools not admit migrant children, while others prohibit their children from speaking to or playing with migrant children. Similar to the “white flight” in the United States (Renzulli & Evans, 2014, p.399), when parents of local students have the social capital or financial ability, they will often transfer their children to schools with fewer or no migrant children by either purchasing property in another school district (P. Liu, 2021; Y. Zhang, 2017), or by paying extra fees for an admission spot in another public school through personal connections (L. Wu, 2013). As migrant students are often being labeled as less well-behaved, local parents believe that having migrant student

classmates could exert adverse peer effects on their children (Yiu & Yun, 2017). Migrant students' non-urban dressing style, dialect accents in Mandarin Chinese, and unfamiliarity with behavioral norms make them easily identifiable from their urban peers (Mu & Jia, 2016). Zhou and Zhong (2022) note that some local students share their parents' disdain for migrant children and stereotype their migrant peers as poor and dull, which makes migrant students feel like outsiders in schools.

Statement of the Problem

Considering that rural migration trends will continue to persist alongside China's rapid economic development, more migrant students will accompany their parents to reside in urban cities in the next few years (D. Li, 2020). Therefore, to continue to promote educational equity in China and to inform current migrant education policy, it is important to investigate migrant students' educational experiences. As schools serve as a space where migrant students interact with their local peers, it is important to explore the school experiences of migrant students who enroll in public schools and their interactions with their urban peers.

Existing research has largely explored migrant students' educational experiences within migrant-specific schools (Y. Chen & Feng, 2013; Goodburn, 2009; J. Han, 2004; Tan, 2010; L. Wang & Holland, 2011), and has mainly focused on students' academic performance (e.g., Lu & Zhou, 2013; G. Ma & Wu, 2019; Y. Ma et al., 2018). Research that has focused on migrant students' experiences in public schools showed that when given access to public education in host cities, migrant students, on average, benefit from the quality of public education and perform similar to local peers on standardized tests (Feng et al., 2017; Xu & Xie, 2015). Some scholars have explored the relationship between

school composition – the proportion of migrant students in schools – and students’ academic outcomes (Hu, 2018; H. Wang et al., 2018). These studies have found that a higher proportion of migrant students in schools negatively influence local students’ test scores in standardized tests (Hu, 2018), especially for local students who were achieving at- and below-medium levels (H. Wang et al., 2018). Relatedly, Zhu (2016), based on the Program for International Student Assessment (PISA) 2012, found that a higher proportion of migrant students in schools is related to lower test scores for migrant students in Math, but not in English or Science. A study by Wang and colleagues (2020) found that migrant students tend to have higher scores in standardized tests when enrolled in public schools with high-achieving peers. Further, when migrant students enroll in schools with more anti-migrant environments, their academic achievement tends to decrease (Hill & Zhou, 2021). Findings from these scholars highlight that school composition—specifically, the proportion of students with a migration background— is an important predictive factor that influencing migrant students’ academic achievements in schools.

Recent years have seen a surge in recognition of the importance of well-being in society, especially among school-aged children (A. Graham et al., 2016; Soutter et al., 2014). Student well-being has now become an inseparable element of students’ integral development process (Roffey, 2015). Well-being generally refers to the experience of health and happiness, which includes mental and physical health, emotional safety, a feeling of belonging, and a sense of purpose and success (Govorova et al., 2020). Scholars have argued that well-being plays a vital role in students’ future lives (Hascher, 2008) and is associated with their academic, social, and work spheres (Chambel & Curral, 2005). Educators and psychologists in China have also called for more care for student well-being

as more than 20% of students in China exhibit psychological issues, and 30% of Chinese students show symptoms of depression, anxiety, self-harm, and other suicidal tendencies (X. Chen et al., 2021). As suggested by scholars, migration can be a stress-inducing phenomenon as the change in living and learning environment is related to students' psychological and social adjustment problems (L. Wang & Mesman, 2015; J. Zhang et al., 2019). In the process of integrating into host cities, migrant children may suffer from anxiety, depression, and other identified risk factors associated with their psychological well-being (Chiu et al., 2012; X. Wang et al., 2017; Wong et al., 2009). In public schools, migrant children can be vulnerable as they need to adjust to the new school and adapt to social changes, including social norms and dialects that are different from their hometowns (Yuan et al., 2013). Considering that student mental, physical, and emotional well-being are all important aspects that contribute to students' life enjoyment and satisfaction (Verboom et al., 2014), this study focuses on migrant student well-being, specifically student mental health, bullying experiences, and sense of belonging to schools, to add to the existing literature on migrant student educational experiences.

Research that has focused on migrant students' well-being is very limited. To date, scholars have only utilized survey data from small samples to explore the issue of well-being among migrant students. Specifically, based on survey data from 393 migrant students in Shanghai, Wong and colleagues (2009) found that 41% of these students self-reported suffering from issues related to their psychological well-being, as measured by their anxiety, depression level, and relationship with school peers. Lu and Zhou (2011), based on data from 12 public schools and nine migrant schools in Beijing, argued that migrant students enrolled in migrant schools are more likely to report feeling lonely than

their urban peers in public schools. Another study from Fang and colleagues (2016), based on survey responses from 301 Chinese migrant students in Guangdong province, found that migrant students who have better relationships with peers in schools reported having better well-being, as measured by their self-esteem and academic aspiration. While providing valuable information on migrant students' well-being, these studies are limited in their generalizability, and ability to provide an accurate picture of migrant students' well-being in public schools. Further, while some studies in China have explored the disparities in well-being in terms of gender (Jin et al., 2021; Zhang et al., 2015) and socioeconomic status (Cai et al., 2017; Huang et al., 2017), the disparities between migrant and local students in well-being in China has not been well explored. As well-being is becoming more and more important in schools and society, it is essential to examine the well-being gap between migrant students and their local peers and provide accurate and valid empirical evidence for policymakers to better serve migrant students in China.

An important factor affecting student well-being is peer contextual effects (Vervoort et al., 2010). Prior research from western contexts focused on student composition in schools, such as immigrant and racial composition, has shown that student composition interacts with students' individual factors and influences students' educational outcomes (Mickelson et al., 2013; Walsemann et al., 2011). In the U.S., students who enroll in schools with a higher number of peers with similar racial backgrounds tend to have a higher academic achievement (Mickelson et al., 2013) and are found to be more engaged in school activities (Walsemann et al., 2011). Similarly, in terms of students' school experiences, scholars from the U.S. have found that the degree to which individuals' ethnicities were represented in their classrooms, as measured by the percentage of students

who shared their ethnicity, moderated the relationship between students' racial background and their school victimization experience (Bellmore et al., 2004; Shin et al., 2011).

Researchers have also found that, in Northern and American and European countries, students with non-European backgrounds experience less victimization in schools with higher proportions of students with immigration backgrounds (Agirdag et al., 2011; Hjern et al., 2013; Vitoroulis et al., 2015; Walsh et al., 2016). These findings align with the person-environment fit theory (Caldwell et al., 2004; Eccles et al., 1997), which proposes that psychological outcomes are a function of the dynamic interaction between the individual and his or her context (Magnusson & Stattin, 2006). In China, the migrant composition in a school can also shape the school context and environment, including school climate and student interactions (Cui & To, 2020). In other words, the migrant composition of a school may introduce unique experiences and challenges important to the well-being of students. However, within the context of public education in China, the role of migrant composition in schools as a school-level factor and its influence on student well-being outcomes has been largely unexplored.

Understanding the well-being of migrant students and factors that can influence well-being such as school composition can be helpful for both educators and policymakers in better serving migrant students in China. While previous studies have mentioned that migrant students benefit from the quality of public education and perform similar to their peers after enrolling in public schools (Feng et al., 2017; Xu & Xie, 2015), less has been researched on the well-being gap between migrant students and their local peers in public schools. Furthermore, as described earlier, research in the United States and European countries has suggested that attending schools with similar peers can serve as a protective

factor for minority students, especially in their psychosocial outcomes (Shin et al., 2011; Walsh et al. 2016). Although prior research from China has found that an increase in the proportion of migrant students can negatively influence students' academic achievement in some subjects (Zhu, 2016), it can serve as a protective factor when considering student well-being. Thus, it is essential to explore the role of migrant composition in the relationship between students' migration status and their well-being. In brief, this is the first study to examine well-being gaps between migrant and urban students in China using generalizable data and to explore the role of migration composition in influencing student well-being. Findings from this study will provide empirical evidence to policymakers in China to better promote educational equity for all students.

Research Questions

This study aims to bridge the gaps in the research on well-being related to migrant students in China by, first, exploring migrant students' well-being in public schools as measured by students' mental health, school-bullying experience, and sense of belongings to schools compared to local students; second, this study aims to explore the role of school migrant composition in the relationship between students' migration status and their school-related well-being. This study uses the most recent Program of International Student Assessment (PISA) 2018 dataset from the Organization for Economic Cooperation and Development (OECD) and employs Hierarchical Linear Modeling (HLM) to examine the well-being of migrant students, specifically 15-year-old migrant students who enrolled in public schools in four provinces in China (Beijing, Shanghai, Jiangsu, Zhejiang), as well as the role of the migrant composition of schools in affecting migrant student well-being.

The research questions that guide this study include:

(1) Is there a well-being gap between 15-year-old migrant and urban resident students in China (Beijing, Shanghai, Jiangsu, Zhejiang)?

(2) What is the association between migrant composition of a school and migrant students' well-being?

Theoretical Framework

Efforts to explore migrant students' well-being begin with understanding factors contributing to students' well-being in schools. Students' well-being remains one of the most important aspects of student experience considered in educational research and policy, along with their academic performance (Clarke, 2020; Willis et al., 2019). Literature has proposed many factors related to student well-being, including but not limited to school climate, peer relationship, and family-school relationship (Huppert et al., 2009; Jones et al., 2007). Ultimately, there seems to be a dynamic interaction between students' individual characteristics and school contextual factors in explaining students' well-being.

Specifically, research has mentioned the importance of *fit* between people and the environment—when people believe that they fit the context, they feel more contented and have greater belonging to the group (Magnusson & Stattin, 2006). Stated differently, when people feel a *misfit* between themselves and the environment or feel like an *outsider*, this negatively influences people's mental and physical health. The adequacy of the fit between an individual and the environment—including characteristics such as race, ethnicity, culture, and power—can affect an individual's behavior, sense of belonging, and overall mental and physical health (Demant et al., 2016). To understand the well-being of migrant students in public schools and the role of migrant composition in this relationship, this study is rooted in the current theoretical perspectives of the person-environment fit

framework. Scholars have applied the person-environment fit framework in exploring gender and racial segregation in education and have demonstrated that the environment—the representation of females and students of color in school—has a substantial influence on students' educational outcomes and whether they feel belonging to their school environment (Porter & Umbach, 2006). In other words, the congruence between person and environment is critical to students' success (Ajayi et al., 2021). Scholars have noted that "congruence of person and environment is related to higher levels of educational stability, satisfaction, and achievement" (Feldman et al., 1999, p. 643).

Under the person-environment framework, person refers to attributes of the person such as socioeconomic status, race, or gender; environment signifies the situations that exist independent of the person's perceptions (Sekiguchi, 2004). In this study, person refers to migrant students, and environment refers to the public school system in large urban cities. Specifically, this study focused on one school-level factor from the environment—the migrant composition in public schools. Guided by the person-environment fit theory, this study proposes that migrant students, as they are continuously viewed as outsiders in urban cities as well as public schools (Mu & Jia, 2016), will tend to show lower overall well-being—lower mental health, more bullying experience, and lower sense of belonging to schools—when compared with their local peers. In terms of the role of migrant composition in schools, this study hypothesizes that, when the migrant proportion increases within a school, migrant students tend to feel more *fit* in the school environment as they have an environment with more similar peers—in other words, migrant students will show better well-being when the migrant proportion increases within the school.

As public-school systems in urban cities in China are increasingly adopting policies

aimed at school integration; moving away from separating migrant and local students in different schools to providing equal education opportunities to *all* students, it is important to examine the degree to which migrant students are socially integrated into the public-school environment and the state of migrant students' well-being in public schools. It is worth pointing out that adopting the person-environment framework aims to emphasize the importance of school level factors in exploring migrant students' well-being. In other words, the *fit* between person and environment is not arguing that students should only be placed in an environment with similar peers; rather, it aims to unpack how school contextual factors—school migrant composition—influence students' well-being and provide implications for better integrating migrant students in schools.

Significance of the study

Increasingly, educators and scholars are arguing that the focus of education systems should extend beyond students' acquisition of knowledge and skills and consider aspects such as mental health and students' school experience (Clarke, 2020; Willis et al., 2019). As stated by Layard and Hagell (2015), students' well-being should become a major objective of schools, and “schools should become as concerned with the well-being of children as they are with their academic performance” (Layard & Hagell, 2015, p.6). The study of student well-being is receiving increased attention as scholars worldwide, including in China, have described it as reaching a crisis point (Chiu et al., 2016; Demissie & Brener, 2017; Rappleye et al., 2020). While the term *well-being* has been discussed and researched in the United States and around the world, it has rarely been given enough attention or a clear definition in China (Xi, 2021). As stated by Skrzypiec and colleagues (2018), while substantial research has been conducted in countries such as the U.S. and

some European countries, research related to student well-being is still limited in China (Skrzypiec et al., 2018). As more students are relocating with their parents to large urban cities in China, providing a more comprehensive picture of the well-being gap between migrant students and their local peers can have implications for educators, practitioners, and policymakers regarding how to address educational equity issues in China. Although some previous research has reported and raised the importance of student well-being in China, this study is the first to examine the well-being gap between migrant students and their peers using generalizable data.

Moreover, it is also acknowledged in the literature that the interaction between an individual's characteristics and the environment is closely related to one's outcomes (Edwards, 2008; Edwards & Shipp, 2007)—a fit between an individual and the context leads to positive outcomes, such as well-being. However, current research in China on migrant students has not thoroughly explored how school composition influences migrant students' educational experiences. Hence, the purpose of this study is to use a generalizable, large-scale dataset to understand one important aspect of the environment or school context, peer composition, associated with migrant students' well-being. This study will provide implications for policymakers to understand how the current integration process influences migrant students' well-being and how schools, as an important social context, can shape students' learning environment, experience, and development. Although previous research from China has provided information on migrant students' school experience, these studies have mainly utilized data from small-scale survey, which includes only a few school samples within certain school districts (Fang et al., 2016; Lu & Zhou, 2011; Wong et al., 2009). In other words, existing research has not used generalizable and

representative data based on which policy recommendations could be made to improve the educational policy of migrant students' well-being.

The findings on the well-being status of migrant children can contribute to our knowledge of the school experience, especially school-related well-being, of the migrant student population in China. From the perspective of migrant children, understanding their well-being bears great importance to their lifelong development. As student well-being can influence students' academic achievement, as well as have a long-lasting influence on their life satisfaction and overall identity development (Verboom et al., 2014; Wakefield & Hudley, 2007), failure to address or consider migrant students' well-being in middle school could undermine their chances of enrolling in higher education institutions, succeeding in the workforce, and eventually affect their upward social mobility. Moreover, if a lack of educational equality resulted in migrants' failure to integrate into mainstream society, social cohesion and stability in China could also be affected (Goodburn, 2009; Hu & Chen, 2007). Understanding the migrant-urban gaps in student well-being and the role of peer composition in affecting migrant students' well-being can provide guidance for educators and policymakers on how to better serve migrant students. In summary, this study aims to fill the gap in the existing literature by exploring the well-being of migrant students in China, as well as the role of school migrant composition in the relationship between students' migration status and their well-being. Using the person-environment fit framework as guidance, this dissertation utilized the China data of PISA 2018 to investigate whether there is a well-being gap between migrant students and their local peers and how school migrant composition relates to this relationship.

Chapter 2 Literature Review and Theoretical Framework

This chapter reviews the current literature regarding students' school-related well-being, studies of migrant education in China, and the guiding framework. It first provides an overview of the definition and measurement of the term well-being in the existing literature and a review of the empirical research findings on student well-being related to this study. Then, this chapter provides an overview of the current literature regarding migrant students' schooling experience in China, specifically focusing on students' well-being, including their mental health, school bullying experience, and sense of belonging to schools. After that, this study introduces the guiding framework and explains how it helps direct the findings of the study.

The Definition and Significance of *Well-being*

Students' well-being is of global interest, as represented by burgeoning literature and news from the United States, the United Kingdom, and other European countries (Chiu et al., 2016; Demissie & Brener, 2017; Rappleye et al., 2020). In recent years, the definition and measurement of student well-being have become an issue with widespread interest from scholars and policymakers worldwide (Ben-Arieh & Frønes, 2011; Diener & Seligman, 2004; Frønes, 2007). Scholars from various fields, such as economics and psychology, have become increasingly concerned about what should be included in the definition of well-being and have generally used the word *well-being* to describe how people think and feel about their lives (Diener et al., 1999). In educational research, there is a rapidly expanding theoretical and empirical literature base on what it means to be *well* (Dolan et al., 2008; Gilman & Huebner, 2003; Kuh et al., 2006). Meanwhile, an increased focus on monitoring adolescents' well-being can also be found at the policy level.

In particular, the United Nations articulated the Convention on the Rights of the Child (CRC) in 1989, which serves as a guide to countries all over the world that ensures children's rights in physical health, mental health, quality education, economic resources, and other related resources that children need in terms of development (S. Lee et al., 2009; Reinbold, 2019). Since the CRC entered into force in 1990, there have been numerous calls worldwide to include the measure of well-being in national and international statistical accounts (Aked et al., 2009; Stratton, 2010). Specifically, in the United Kingdom, the government has set up a Quality-of-Life Policy Group and stated, "it's time...we focused not just on Gross Domestic Product, but general well-being" (Bache & Reardon, 2013). Educators in the United States also suggest that the construct of well-being should be more clearly defined in public policies instead of just a phrase without functional use (Schulte et al., 2015). This growth of discussion in terms of well-being reflects larger societal trends concerning the value of the individual, the importance of subjective views in evaluating life, and the recognition that well-being is a necessary aspect of life besides economic prosperity (Diener et al., 1999).

Despite the significant attention to well-being in both academic discussion and policy circles, the meaning of well-being remains narrowly defined, especially in the field of education. Educational researchers have demonstrated various definitions of the term well-being and have used words such as life satisfaction or mental health interchangeably when discussing the issue related to student well-being (Govorova et al., 2020). Some researchers even raised concern that these various definitions of well-being have complicated the efforts to plan, monitor, and support the development of student well-being in an effective way (Konu et al., 2002; Soutter et al., 2014).

Previously, evaluations of student development in the school context involved quantifiable measures and mainly focused on students' academic achievement, such as students' grades, test scores in standardized tests, attendance records, or suspension rates (Grissom et al., 2015; Shavelson, 2010). However, following the surge in recognition of well-being in student development, educators started to incorporate well-being as a significant part of student development. Educators and scholars are increasingly arguing that education systems should focus beyond students' acquisition of knowledge and skills and consider aspects such as mental health and students' relationships with others in schools (Clarke, 2020; Willis et al., 2019). Policies and programs started to relate student well-being to constructs such as physical and mental health (Barkham et al., 2019) and have also pointed out the importance of school conditions, contexts, and climates that facilitate healthy schooling experiences for students, such as safety, support, relationships, belongings, and engagement (Huppert et al., 2009; Jones et al., 2007). Although educational researchers have not yet reached a consensus on a specific definition of student well-being and how well-being should be measured quantitatively (Rappleye et al., 2020), there is a general agreement in recent decades among educators, scholars, and policymakers that well-being is important, and the measurement of well-being should be undertaken in major surveys within a country or internationally. Therefore, starting from 2015, the PISA data incorporated a new instrument to evaluate 15-year-old students' socio-emotional variables related to their well-being, alongside measuring students' academic assessments (Organization for Economic Co-operation and Development [OECD], 2017). As defined by the OECD report, student well-being covers multiple dimensions of students' lives, including their cognitive, psychological, physical, and social aspects.

Focusing on student well-being, especially students at the age around middle school to high school, is particularly important as scholars have mentioned that this is a significant transition time in adolescents' lives (Buchanan & Bowen, 2008). Students at this age are not only adapting themselves to challenges in their academic environment but also with transformations physically and psychologically, as well as in the field of emotions and relationships with others. Promoting student well-being is of great importance as scholars have argued that well-being plays a vital role in students' future lives (Hascher, 2008), and it is associated with their academic, social, and work sphere (Chambel & Curral, 2005). Some scholars even argued that students' well-being should be considered more important than students' academic achievement in schools (Midgley & Edelin, 2010; Willis et al., 2019; Yao et al., 2018) as students with higher levels of emotional functioning tend to earn higher grades, were more academically motivated, and had greater levels of school engagement (Buchanan & Bowen, 2008; Maddox & Prinz, 2003). Therefore, a greater understanding of students' well-being can help schools better support student growth and provide implications for educators and policymakers on better serving students in all aspects.

Aligning with previous research and the OECD report, this study defines student *well-being* as a dynamic state characterized by students experiencing the ability and opportunity to fulfill their personal and social goals, specifically focused on students' schooling experience. More specifically, this study's measure of student well-being includes students' mental health, school bullying experience, and sense of belonging. While students' bullying experience and mental health served as indicators for their health-related factors, students' sense of belongings in school captures how they feel about school and

their relationship with school peers. Therefore, the below section reviews current literature on student well-being from these aspects: student mental health, school bullying experience, and sense of belonging to schools.

International Literature on Well-being, Migration, and School Composition

Migration and Student Well-being

The word migrant has often been used to refer people who move away from their usual residence within the country or across borders (Gibson & Carrasco, 2009). While some people choose to migrate to another place for better job opportunities, living conditions, or educational resources; others are forced to leave their original place of residency due to reasons such as violence and conflict (Caravita, 2016). This study focused on migrant population within China, especially students who migrated with their parents within the country. Within China, people migrate mostly from less developed rural areas to large urban cities, aiming for better job opportunities and living conditions (Goodburn, 2009).

As an important factor in student well-being, mental health is documented as a concern that is on the rise globally among students (Becker, 2021; Forbes-Mewett & Sawyer, 2016), and students who have mental health issues are found to suffer from lower grades, problem-related behaviors, and school dropout (Storrie et al., 2010). In fact, according to the World Health Organization (2020), approximately 20% of adolescents worldwide suffer from mental health issues, including but not limited to depression, anxiety, or sleeping problems, indicating that well-being is a common issue faced by school-aged children across countries (Inchley et al., 2020; Y. Lee, 2007). Considering the increasing trend in both the scale and speed of migration worldwide in recent decades,

more research has started to focus on whether this trend influences peoples' mental health (Alegría et al., 2017; J. Chen & Vargas-Bustamante, 2011; Finno-Velasquez et al., 2016). Scholars have demonstrated that migration—moving from one social, racial, or cultural setting to another—can be very stressful, with potentially negative impacts on people's mental health (Bhugra & Jones, 2001). As stated by the World Health Organization (2001), migration usually “does not bring improved social well-being; rather, it often results in...exposing migrants to social stress and increased risk of mental disorders” (p.13).

Empirical research has confirmed that the experience of migration and resettlement in a new country is associated with mental health risks. Specifically, scholars mentioned that immigration status creates an additional layer of mental stress for students as they encounter acculturative stress in host countries (Finch & Vega, 2003; Thoman & Surís, 2004), meet challenges in negotiating identities, experience discriminative perceptions (Viruell-Fuentes, 2007), and also expose to structural inequalities (Card, 2009) such as the social welfare system. Compared to native students or residents, students with immigration backgrounds are more likely to show higher levels of mental health issues, including but not limited to psychological distress and depressive symptoms (Dimitrova et al., 2016; Schwartz et al., 2013). However, it is important to mention that family socioeconomic status served as a protective factor in immigrant students' mental health – when immigrant students have relative higher socioeconomic status compared to their native peers, they are found to show similar self-reported mental health levels with their peers (Alegría et al., 2017; Garcini et al., 2016). Scholars explained that a high socioeconomic status might help reduce the barriers immigrants face in the migration process, increasing their self-efficacy in the host country and promoting their mental health (Garcini et al., 2016).

Besides mental health, school bullying experience has also been found related to student well-being. Generally, bullying is defined as frequent negative actions by one peer or a group of peers toward another individual or a group, which involves an imbalance in physical or social power (Olweus, 1978). Peer bullying and victimization are highly prevalent among students all over the world. In a large-scale international study, Eslea and colleagues (2004) reported that around 25.6% of students in Italy had experienced bullying victimization, 17% of students in Spain had participated in bullying activities, and this number is even higher in the United States (Eslea et al., 2004). Such prevalence rates are alarming given the relationship between bullying and victimization and various mental health problems, such as depression, loneliness, and anxiety (Hawker & Boulton, 2000).

Research has indicated that students with a migration background are easy targets for bullying due to their different ethnic or racial backgrounds, cultures and values, and other physical traits such as language and clothing (Eslea & Mukhtar, 2000; Peskin et al., 2006; Vervoort et al., 2010). This is confirmed by studies from the United States (Maynard et al., 2016) and European countries (Alivernini et al., 2019; Ammermueller, 2012), where scholars have found that students with immigration or refugee background are more likely to be marginalized and experience discrimination, rejection, and school-bullying by their native counterparts. In addition, migrant students are more likely to have a low social standing in the host country due to prejudices toward their race/ethnic group or social-economic status (Mendez et al., 2012) and are less likely to have well-developed support networks (Oppedal et al., 2016) – both factors increase students' risk of experiencing bullying victimization in schools.

Another aspect that proxy students' well-being in school is their sense of belonging to

the school community. Students' sense of belonging to the school community represents the extent to which students feel accepted, respected, included, and supported by their school community, including school peers, teachers, and other staff members (Goodenow & Grady, 1993). Specifically, a student's sense of belonging at school is a psychological state in which students "view schooling as essential to their long-term well-being," as reflected in students' participation or engagement in schoolwork or school activities (Willms, 2003). Scholars have indicated that students' sense of belonging to school is strongly associated with their academic performance (J. Lee, 2014), mental health (Huang, 2020), and other related school experience (C.-K. J. Lee & Huang, 2021). In this case, a sense of belonging to school can be especially important for minority and disadvantaged student groups as schools serve as a major context where they interact with and build relationships with peers (Fredricks et al., 2004).

Scholars have found that students' sense of belonging is positively related to their mental health – students who have a stronger belonging to school often report fewer mental health issues, show fewer depressive symptoms or anxiety related to academics (Anderman, 2002), and have a better relationship with their peers (Allen et al., 2018). As demonstrated by Allen and colleagues (2018) based on a meta-analysis of 51 studies, student mental health and their sense of belongings to school are strongly correlated to each other, suggesting a reciprocal relationship between mental health issues and school belongings. Meanwhile, students who indicated a higher sense of belonging to schools also reported a low likelihood of experiencing isolation and bullying victimization in schools (Stewart et al., 2009).

Several scholars have specifically explored the relationship between students who

have an immigrant or migrant background and their sense of belonging to schools (Chiu et al., 2016; Ham et al., 2017). Studies have suggested that, as migrant students typically face more cultural barriers such as language barriers (Borgonovi & Ferrara, 2020), have fewer cultural resources in the form of knowledge and values (Chiu et al., 2016), these students tend to meet difficulties when adapting to schools and are more likely to report a lower level of sense of belonging to schools (Ham et al., 2017). Native students, however, tend to be more familiar with their school values and norms, behave more appropriately in school, and build better relationships with their teachers and schoolmates; therefore, they tend to report a strong sense of belonging to schools (Chiu & McBride-Chang, 2010; Chiu & Zeng, 2008).

The Role of School Composition

Considering that school presents an essential setting for socio-cultural integration and interaction between migrant students and their native peers, research has noted that schools are important for students' mental health development (Holland, 2012). Scholars have demonstrated that students' mental health can be influenced by factors in the school context and have explored the role of school composition in migrant students' mental health (Gielsing et al., 2010; Higgen & Mösko, 2020). Existing research indicated that, for immigrant students, attending schools with a high proportion of native and/or more socioeconomically privileged peers could in fact be unfavorable (Silveira et al., 2019). Specifically, Silveira and colleagues (2019), based on data from more than 40 countries, have found that students with an immigration background reported a lower level of mental health in schools when schools have a majority of native students. Researchers explained that this negative relationship between a high concentration of native students and

immigrant students' mental health could be attributed to the social comparison mechanism – students from socially more disadvantaged backgrounds could feel inferior both academically and socially when they enroll in schools that have a high concentration of native students (Göllner et al., 2018). Another study from Shin and colleagues (2011) that specifically focused on Korean American students has found that when there is a higher proportion of White students in schools, students are more likely to report being bullied and experiencing discrimination, which, in turn, is related to a higher level of depression reported by these students. In other words, for immigrant students, experiencing a school environment with few numbers of peers who share similar backgrounds can produce more stress related to peer relationships and socialization, which is associated with higher levels of mental stress.

Moreover, research suggested that individuals are more likely to experience bullying in circumstances where they belong to a relatively small group, are perceived as different from the majority, or hold less social power. Students who belong to smaller groups may deviate from the majority group norm in discernible ways, such as appearance, language, and behavior, increasing the risk of peer rejection and victimization (Scherr & Larson, 2010). Scholars explained that the differences between students who are the minority in terms of race, ethnicity, or culture and students who belong to the majority group might represent a poor fit with the school environment depending on the school composition, which finally results in peer bullying and victimization (Mueller et al., 2015; Spriggs et al., 2007). In other words, in schools with low minority concentration, minority students are more likely to be perceived as different by students who comprise the majority group and consequently experience higher levels of isolation and peer victimization (Llorent et al.,

2016; M. Xu et al., 2020). Studies from the United States and some European countries have indeed found that immigrants, particularly those who have different racial/ethnic backgrounds from native people, experience more victimization in schools with a relatively low proportion of immigrant students (Hjern et al., 2013; Vitoroulis & Georgiades, 2017; Walsh et al., 2016).

While having a relatively high concentration of minority students can be helpful for minority students in reducing the risk of school victimization, it is important to mention that research has found no effect of student composition on the likelihood of experiencing school victimization of students who are in the majority group (Agirdag et al., 2011). Scholars demonstrated that majority students' social standing might be less sensitive to school composition variations than their minority peers (Plenty & Jonsson, 2017). Scholars explained that this could be attributed to the fact that students who are identified as racial, ethnic, or cultural majority tend to have more social power and connectedness with where they study or live; therefore, they are less likely to be influenced by the composition of minority students in schools in terms of victimization (S. Graham, 2006; Juvonen et al., 2006). Nonetheless, findings on school compositional characteristics and student bullying experience demonstrate a link between a numerical power imbalance between groups and peer victimization (Chaux & Castellanos, 2015). This line of research suggests that students who belong to a minority group in their school are more likely to experience victimization and mental health difficulties by virtue of their underrepresentation and potentially lack of social power at the group level (S. Graham et al., 2006).

In terms of the sense of belonging, scholars have suggested that being together with peers having similar backgrounds can help to promote students' sense of belonging to

schools as a sense of belonging is associated with a perception of fit with the environment (Benner & Graham, 2007; Iyer et al., 2009; Walton & Cohen, 2007). Empirical evidence suggests that school composition is related to students' sense of belonging in schools. Specifically, having contact with peers from a similar background can help reduce students' isolation (Schmitt & Branscombe, 2002), make them feel more accepted, and gain social support in schools, which, in turn, diminish their stress in adapting to school norms and increase sense of belonging to schools (Fangen & Lynnebakke, 2014; Mok et al., 2016). In other words, the student composition in schools – the representation of peers with similar backgrounds – conditions the level of sense of belonging a student has to a school (Georgiades et al., 2012). A higher representation of peers with similar racial, ethnic, or cultural backgrounds has been found to be associated with students' decreased experience of feeling alienated and increased perceptions of school belonging and safety (Benner & Graham, 2007; Juvonen et al., 2006).

In summary, international studies regarding students' school-related well-being have shown that students who have immigrant or migrant backgrounds or students who are perceived as a minority in terms of race, ethnicity, or culture in schools are more likely to show lower overall well-being compared to their peers who identified as in the majority group. Specifically, students who have a migration background are more likely to have issues with mental health, such as depression or anxiety (Alegria et al., 2017); more likely to experience school bullying (Vervoort et al., 2010); and are more likely to report a lower sense of belonging to schools compared to their peers (Chiu et al., 2015). What is more, research also indicates that the composition of the school population is related to the well-being of students, especially for students who are in social, cultural, or racial minority

groups. Researchers demonstrated that, for students in these minority groups, a higher representation of peers with similar backgrounds could help reduce their stress in acculturation, which is beneficial to their mental health (Higgen & Mosko, 2020). Meanwhile, a higher representation of similar peers may help mitigate the differences among students, thereby reducing the bullying victimization experience of minority students (Agirdag et al., 2011). Lastly, being together with peers from similar backgrounds can promote students' feeling of being supported and accepted in the school setting, which strengthens students' sense of belonging to schools (Benner & Graham, 2007).

Literature on migrant students' well-being in China

In China, student well-being has become a concern as news of school suicide continues to appear in newspaper headlines (Gan, 2021; Palmer, 2021). Educators expressed particular concern regarding migrant students' well-being because of the existence of the hukou policy. This policy has not only excluded migrant families outside the social welfare system but also divided migrant students and their local peers into two different social identities (Zhou & Cheung, 2017). When migrant students move to destination cities, they are confronted with new social surroundings and may struggle with reestablishing their identities within receiving communities (Dong & Blommaert, 2009). Thus, migrant children need to transform their social identities from a local child in their hometown to a non-local migrant child—this is a challenging process and can be extremely difficult when students are socially excluded within their schools (Yuan et al., 2013). Migrant students from ethnic minority groups also have to face disconnection in the curriculum—while having ethnic minority language in their hometown, the curriculum in urban cities is only using Mandarin Chinese as the single teaching language (Li & Zhao,

2017).

Previous research has mentioned that migrant students in China often experience social exclusion in schools—specifically, being excluded and discriminated against by their peers (X. Li et al., 2010; Mu & Jia, 2016; H. Wang et al., 2018). In a survey study conducted in Guangzhou, which serves as one of the largest migration destinations in China, around one-third of migrant children reported being teased by local children based on how they communicated and looked (Hou et al., 2011). Qualitative studies have also documented migrant students’ social exclusion in schools—in Beijing, Li and colleagues (2010) interviewed school teachers and confirmed that teachers had observed the unwelcomeness of migrant students from their urban peers in both class discussion and activities. Similarly, Mu and Jia (2016) interviewed teachers and principals in Beijing and found that migrant students’ accents from the rural area, style of dress as well as behavioral patterns such as loudness and impoliteness in public made them identifiable from their urban peers and thus, being discriminated. The researchers found that urban students use words such as “outsiders” or “undisciplined” to describe migrant students (Mu & Jia, 2016). Consistently, parents of migrant students also reported that their children only had the chance to mix with other migrant students and were not accepted as friends by local students (H. Wang et al., 2018). In this case, it is not surprising that migrant students, especially those with low socioeconomic status, show a lower sense of belonging to schools compared to their urban peers (Liu et al., 2018).

Scholars have argued that the experience of social exclusion and discrimination can adversely affect students’ mental health and have demonstrated that migrant students, on average, show more mental health problems compared to their urban peers (Coker et al.,

2009; Gao et al., 2015). Specifically, migrant students are found to suffer from depression, anxiety (Wong et al., 2009), and loneliness (Lu & Zhou, 2013) within schools. Wong and colleagues (2009) surveyed migrant students in Shanghai and found that they are more likely to show symptoms of anxiety, depression, and generalized anxiety disorder—migrant students whom their local peers have discriminated against were 4.5 times more likely to have poor mental health; migrant students whom teachers have disciplined were 2.3 times more likely to have poor mental health. Lu and Zhou (2013) argued that migrant students are more likely to have mental health issues due to their higher level of loneliness in schools—when students are not welcomed by their peers, they are less likely to be granted a group identity and more likely to feel isolation and depression. Similarly, another study by Gao and colleagues (2015), based on a student sample from ten schools in Shanghai, also found that migrant students reported more mental health problems and lower satisfaction than local peers. However, this study also found that migrant students who attended public schools with urban peers had no difference in mental health measures compared to their urban peers (Gao et al., 2015).

In terms of student school bullying experience, although it is not an uncommon issue in China, empirical research on school bullying is limited (Han et al., 2017; Q. Wu et al., 2015). Based on the 2018 OECD report, approximately 20% of students self-reported to involve in some bullying activities in schools; However, there has not been a state-level or nationwide data on school bullying (Z. Liu, 2016). To date, three studies have examined the relationship between migrant students in China and their school bullying experience—specifically, bullying perpetration (Cui & To, 2019, 2010; Tan, 2010). Tan (2010) surveyed 758 migrant children from two cities in China and, descriptively, found that approximately

21.8% of migrant children were involved in bullying perpetration, which is higher than the prevalence of 14.9% among the general student population in the survey area. Using survey data from eight schools in China, Cui and To (2019) examined the relationship between students' migration status and their involvement in school bullying perpetration and found that migrant students are more likely to engage in bullying perpetration than their local peers. The researchers further explained that migrant students are involved in bullying perpetration to cope with their loneliness and stress living in host cities since they are separated from their friends and extended family members in their hometowns (Cui & To, 2019). Another study from Cui and To (2020), using the same survey data as Cui and To (2019), demonstrated that migrant students are involved in bullying perpetration to attract attention from others as they are often unwelcome by their peers and meet difficulties integrating into the society.

Although these studies have provided valuable information on migrant students' school experience, no study has examined migrant students' well-being in public schools using generalizable data. Specifically, prior research that compared the educational experience of migrant students and their local peers includes migrant students from both public and migrant-specific schools, which obscures the school context between these two types of schools and their influence on students' school experience. Although the integration of migrant students into public schools still meet some challenges, it is necessary to reveal the current well-being situation of migrant students in public school, which will provide empirical implications and policy guidance for further integration. This study, therefore, compares migrant students' well-being to their local peers specifically within public schools. Additionally, the PISA 2018 data utilized in this study, including the

four largest migration destination provinces in China (Beijing, Shanghai, Jiangsu, Zhejiang), can compensate for the findings from prior research that used small-scale survey data within schools or districts.

Moreover, this study is the first to examine the school-level variation in the issue of student well-being. Acknowledging that public schools in China, especially those in large urban cities, differ in their process of integrating migrant students (D. Li, 2020; Z. Liang et al., 2020). it is necessary to investigate how the migrant composition of schools influences migrant students' school experience. In other words, the proportion of students who are migrants relative to students who are local residents varied in public schools due to schools' differences in implementing the *Outline*. Therefore, considering the migrant composition when exploring the issue of migrant students' well-being is essential, especially in the context of China.

On one side, aligned with international literature, the migrant composition of a school may moderate the relationship between students' migrant status and their school-related well-being (Vervoort et al., 2010). Studies focusing on the role of racial/ethnic composition of schools have found that the relationship between racial/ethnic minority students and their school experiences is heterogeneous based on schools' racial/ethnic composition (Vervoort et al., 2010; Walsemann et al., 2011). For example, as Walsemann and colleagues (2011) demonstrated using national representative data in the U.S., when Black students attend a predominantly-minority school, they are less likely to experience discrimination or show depressive symptoms, which, in turn, increases their engagement in schools. Considering that migrant students are likely to deviate from the group norm in terms of dialect, clothing styles, or social behaviors (T. Wang, 2015), migrant status can serve as a characteristic to

identify children who do not fit in with the general population in schools. Migrant students in schools with only a small proportion of migrant peers may feel more depressed, experience more bullying victimization, and have a lower sense of belonging to schools compared to migrant students enrolled in schools with higher proportions of migrant peers.

On the other hand, in China, a higher proportion of migrant students may lead to tension between migrant and local students (H. Wang et al., 2018). The negative attitudes from local people to migrants have already formed local parents' bias on the potential effects of migrant students' growth on local students' academic achievement (N. Li & Placier, 2015). Specifically, local parents believed that, as migrant students are more likely to be socioeconomically and academically disadvantaged, the commensurate changes in student composition will be detrimental to the learning and behavior of local students (Y. Chen & Feng, 2013). These perceptions from parents are also found consistent with those from public school teachers as they described migrant students as "unfavorable others due to their different behaviors, such as loud voice or dialect accent when speaking" (Mu & Jia, 2016). Although empirical studies have documented that the enrollment of migrant students does not harm local students' academic achievement (Min et al., 2019; H. Wang et al., 2018), these perceptions from teachers and parents will still shape the school climate and interactions among students—especially between migrant and local students, which, in turn, influence migrant students' well-being in schools.

To the best of my knowledge, no study has systematically explored the relationship between migrant status and students' well-being in public schools using large-scale data, as well as the role of migrant proportion in this relationship. The overarching goal of this study is to explore: first, whether migrant status is related to student well-being within the

public school system; second, whether and how the migrant composition of a school influences the relationship between migrant status and student well-being. As most of the studies focusing on student well-being in China used survey data from several schools or cities (Cheung, 2013; Yang et al., 2018), it becomes necessary to explore this issue using national represented data such as PISA so that more implications or policy-relevant suggestions could be provided to researchers and educators.

Theoretical framework: Person-environment fit

To understand the well-being of migrant students in public schools and the role of migrant composition in this relationship, this study is rooted in the existing theoretical perspectives of the person-environment fit framework (Edwards, 2008; Edwards & Shipp, 2007). This section will first provide an overview of the person-environment fit framework and then use this framework to review the situation of migrant students and policies that impact the environment where migrant students live in China.

Overview of the Framework

There is a line of research in the field of social sciences that investigates how personal and contextual factors interact to promote adaption to the contexts in which one resides (Moos, 1987). Scholars in the social sciences fields have generally agreed that when there is a certain level of correspondence between the individual and the context, the adaptation process will move forward positively (Caldwell et al., 2004; Eccles et al., 1997). Specifically, adaption means that people feel content in the context—they develop positive mental health, have higher self-esteem, feel they belong to the context, and ultimately reach better well-being. Scholars have developed these arguments and built them into the person-environment fit framework (Magnusson & Stattin, 2006; Moos, 1987). In particular, the

person-environment fit framework focuses on the interaction between an individual and the environment and argues that the individual not only influences their environment, but the environment also affects the individual (Sekiguchi, 2004). In other words, both the individual and the environment are important factors when exploring behavioral or psychological issues.

Applied to the school context, the person-fit framework implies that students are more likely to develop better educational outcomes when they have a positive relationship between themselves and the school environment in which they reside. Scholars have applied the person-environment fit framework mainly in exploring the role of racial/ethnic composition in students' development (Ajayi et al., 2021; Demanet et al., 2016). In general, scholars have found that students' enrollment in schools with a higher proportion of peers in the same racial/ethnic or cultural background is associated with a range of beneficial outcomes—including academic achievement and their well-being (Benner & Graham, 2007; Georgiades et al., 2012). The rationale behind this argument is that people tend to feel inclusive and build positive relationships with others with a similar background, making them feel more like they belong to the environment. In other words, the more students perceive compatibility between themselves and their school context, the better they feel that they fit into the school (Graham et al., 2008). Therefore, it is not surprising to see that students are more likely to benefit in terms of educational outcomes when enrolling in schools with a higher proportion of peers who share similar background characteristics, compared to enrolling in schools with only a few peers who share similar experiences (Mickelson et al., 2013; Phillips et al., 2015).

Some studies have applied the person-environment fit framework in exploring the

well-being of minority students—students who are perceived as racial/ethnic minorities (Demagnet et al., 2016) and students who are perceived as minorities due to their migrant or immigrant backgrounds (Buckingham & Suarez-Pedraza, 2019). Scholars have found that minority students are more likely to fit into the school environment when having peers who share similar experiences (Georgiades et al., 2012; Goodenow & Grady, 1993; Johnson et al., 2001). Having a higher proportion of peers in the same racial/ethnic or cultural group has been found beneficial to students' identity (Hurd et al., 2013), behaviors (Demagnet et al., 2016), mental health (Buckingham & Suarez-Pedraza, 2019), peer relationship (Barth et al., 2013), and sense of belonging to schools (Byrd & Chavous, 2011) as students feel more connected with their schools.

A group of scholars has explored whether the fit between person and environment—in terms of the racial/ethnic proportion of similar peers in school—matters to a greater extent for some student groups (Benner & Graham, 2007; Georgiades et al., 2013; Juvonen et al., 2006). Specifically, Benner and Graham (2007) found that having more peers with similar racial/ethnic backgrounds is more beneficial for minority students than majority students in terms of educational outcomes. Vervoot and colleagues (2010) also found that having more peers who are also being identified as racial minorities is associated with a lower probability for minority students of being bullied or victimized in schools, but no difference for students who are in the racial majority group. Scholars explained that this can mainly be attributed to the sociocultural perspective that considers the images of minority people—as minority people have historically been subject to negative stereotypes, minority students are more likely to perceive having more difficulties at school (O'Connor & Fernandez, 2006; Vang, 2005). In addition, minority students are more likely to perceive

a discrepancy between their own culture or value and school culture, and therefore, they have more difficulties adjusting or fitting into the school environment. In this case, when minority students endure persistent negative stereotypes, the numerical presence of peers with similar backgrounds can help promote their feelings of fit between themselves and the school, which, in turn, results in higher feelings of acceptance, support, and belongings at school (Goodenow & Grady, 1993).

Person: Migrant Student in China

In China, migrants generally refer to the rural workers and their families who registered their households in rural areas but work and reside in urban cities (Gui et al., 2012). Since hukou is heredity in nature and people cannot change their hukou status without government approval, migrant children are usually second-generation migrants (Lan, 2014). Even some migrant children are born and raised in urban areas, they are still classified as migrants on their official documents, including but not limited to their household registration card and their identification card.

As suggested by the person-environment fit framework, the level of fit between person and environment is mainly based on the similarity between personal characteristics and the characteristics in the context (Pawlowska et al., 2014). However, in China, significant regional differences exist in terms of culture, language, beliefs, and religion (Y. Gong et al., 2011). For migrant people who reside in urban cities, their accents, speech codes, clothing styles, and even food tastes serve as cultural markers that can easily set them apart from local urban residents (Dong, 2018; Dong & Blommaert, 2009). What is more, while local urban residents usually possess higher levels of education or hold better jobs, migrant people are marginalized in employment as most of them have only

elementary or junior high school education. As a result, migrants are mainly involved in construction, transportation, garbage collection and other manual labor work (X. Li et al., 2006). The differences between migrants and urban residents in terms of characteristics served as bases of prejudice and discrimination towards them—as documented by Zhang and Liang (2007), they are considered by urban residents as rough, impolite, and dirty, and are also blamed for the thefts, crimes in the city.

Migrant students, as the second generation of migrants, share the blame on migrants and are also targets of being marginalized in public schools (D. Zhang & Luo, 2016). Many scholars have mentioned that it is hard for a student who is different from the majority to fit into a school with new teachers, teaching methods, different accents, and new learning environments (S. Chen et al., 2013; Kwong, 2011; Sui, 2005). For instance, Sui (2005) documented that when migrant students speak mandarin Chinese with an accent, teachers in public schools often make fun of them by asking, “which country do you come from,” which enforces migrant students’ feeling of being an outsider. Additionally, unlike local students who can afford new uniforms, mobile phones, or computers, migrant students often wear old and ill-fitting ones and have little exposure to computers (Kwong, 2011). They are also behind and cannot afford the extra-curricular activities offered by the school (Yu, 2020). Therefore, migrant students often perceive themselves as “outsiders” or “strangers” who can hardly fit into the school context (Koo et al., 2014; Ming, 2013).

More disturbingly, although public schools are equipped with higher quality teachers and better school resources compared to migrant-specific schools, migrant students, in fact, expressed more preference for entering migrant-specific schools (Kwong, 2011). Scholars who have interviewed migrant students in Beijing have found that migrant

students prefer migrant-specific schools because these schools are located in the migrant community so that students feel “they are among ‘their own people’” (Kwong et al., 2011). Survey results from Anon (2007) showed that migrant students have better relationships with peers when enrolling in migrant-specific schools because most of their peers come from similar backgrounds, speak the same dialect, and most importantly, “no one looks down on them.” Migrant students stated that they feel more belonged and comfortable in migrant-specific schools as they do not have to face the discrimination and stigma experienced by their counterparts enrolled in the public school system. In other words, migrant students’ preference for migrant-specific schools can be attributed to the marginalization and unwelcome they have experienced from their local peers, rather than simply prefer to stay in an environment with more similar peers. These findings aligned with the person-environment fit framework and raised the importance of the relationship between migrant students and their peers in the school context.

Environment: The Public-school Context

For migrant children, schools serve as one of the most important institutional environments, having the potential to expose students to different values, norms, academic rules, and routines (Hamilton, 2013). As suggested by the person-environment fit framework, whether the school can provide an inclusive environment for migrant students can also influence the fit between students and the context. However, though the number of migrant students enrolled in public schools has increased in recent decades, especially after the implementation of the *Outline*, migrant students are not treated the same as their urban peers in the public school system. For instance, migrant students are not considered for any financial aid, scholarship, or honors due to their hukou status, and they do not receive any

recognition in country-level or province-level competition as those are mainly reserved for local students (Wang, 2020). What is more, some schools have even created separate timetables for migrant students or separated them into special classes using a different set of textbooks as a way to reduce their interactions with their local peers (Qian & Walker, 2015). Although some scholars have argued that the motivation of schools for separating migrant students from their urban peers can come from a pedagogic perspective, keeping migrant students apart from other students—which exists in many public schools even now—perpetuates migrant students' marginality in both the public school system and the society.

The way public schools have treated migrant students has given teachers and students licenses to do likewise (Kwong, 2011). Some local students see migrant children as inferior and make them feel like second-class citizens (Ling, 2015). An academically strong migrant student who enrolled in public school has stated that her English teacher has laughed at her English accent and described her way of speaking English as "United Nation English" (Xue, 2005, p.260). Local students often mimic and make fun of migrant students and label them as "outside gangs" (Lu, 2006). China Labor Bulletin (2013) reported that a shocking 86.3% of migrant children in public schools were not friends with local children, and 7.1% did not have any friends at all. When being asked to describe the relationship between themselves and their urban peers in public schools, migrant students often have a clear sense of the difference between themselves and their peers and use the term "we" and "they" (Gao, 2008; Shi, 2005). Specifically, migrant students use "we" to refer to students who have similar migration backgrounds to themselves and "they" to refer to students who are local residents in their host city. In other words, migrant students see themselves as a

group apart from their urban peers in schools. In this vein, it can be hypothesized that public schools may negatively affect migrant students' educational development since urban students tend to hold discrimination and prejudice against migrant children, putting them through long periods of psychological adaptation (Qin, 2013).

Although the educational conditions of the migrant children in China have improved a little over the years since the implementation of the *Outline*, migrant students have continued to lead a marginal existence in the public school system (Liang et al., 2019). They are barred by state laws and regulations from sharing the city's resources or fully participating in many of its activities. Their social exclusion is based on their social status and rural origin, each reinforcing the other. Moreover, migrant students are constantly reminded of their inferior status even in school, the supposedly great equalizer of society (Kwong, 2011). Aligned with the person-environment fit framework, the social and public-school regulations, as well as the attitudes of teachers and local students in schools, have reinforced the marginalization of migrant students in both their host cities and schools.

In summary, the person-environment fit framework suggests that individuals are more likely to develop better outcomes when they feel they fit the surrounding context (Demantet et al., 2016). The empirical research related to migrant students in China indicated that the different characteristics between migrants and their local peers (Dong, 2018), as well as the stigmas that existed in the overall social context (Qian & Walker, 2015), all contribute to the marginalization of migrant people, which, in turn, influences migrant students' well-being – including being alienated, discriminated, and not being part of their school environment. In other words, stigma toward migrant people and social

exclusion in public schools have gone hand in hand to make migrant students feel that they should not be in a particular school and do not belong there. However, international research that focused on the role of student composition in schools has suggested that having a higher proportion of similar background peers—as a proxy of students’ feeling of being understood and accepted—can have a positive influence on students’ sense of fit, which, in turn, yielded better outcomes. Therefore, using the person-environment fit framework, this study explores migrant students’ experience in the public-school context and how changes in the school context, as measured by the proportion of migrant students in schools, influence migrant students’ schooling experience. Acknowledging that the Chinese government has implemented a series of educational policies since 2001 to provide public education to more migrant students, this study aims to explore how school composition plays a role in this integrating process. In other words, instead of simply arguing for increasing or decreasing the proportion of migrant students in public schools, applying the person-environment fit framework in this study aims to explore migrant students’ fit in public schools and whether school composition plays a role in this integration process, as one way to provide implications to educators and policymakers in China.

Chapter 3 Methods and Research Design

This study explored the well-being of migrant students in China, as well as the role of migrant composition in schools in students' well-being. Chapter three is organized as follows: First, it provides a detailed description of the data used in this dissertation, including an overview of PISA which served as the data source, the rationale for choosing this data, the benefits and limitations of using this data, a description of the study sample, and the sampling procedure. This study utilized the three measures from PISA 2018 – student mental health, student school bullying experience, and student sense of belonging to schools – as measures of students' school-related well-being. Then this chapter provides the description of all variables that are used in the analysis, including dependent, independent, and covariate variables. Next, this chapter presents the analytical model used in the present study, which is Hierarchical Linear Modeling (HLM). The research questions examined in by this study include: (1) Is there a well-being gap between 15-year-old migrant and urban resident students in China (Beijing, Shanghai, Jiangsu, Zhejiang)? (2) What is the association between the migrant composition of a school and migrant students' well-being?

Data Source

This study utilized the PISA 2018 dataset from the OECD, which is the world's largest international education study that assesses the mathematics, science, and reading competencies of 15-year-old students (OECD, 2019). Designed by the OECD, PISA is a survey that provides policy-oriented indicators of educational outcomes regarding the knowledge and skills mastered by students close to the end of their compulsory education (Siniscalco, 2003). Specifically, PISA is a survey that aims to measure how far students

approaching the end of compulsory education have acquired some of the knowledge and skills essential for full participation in the knowledge society (D. Xu & Dronkers, 2016). PISA was first carried out in 2000 and is repeated on a 3-year cycle to capture changes in educational outcomes that have happened over time (Bybee & McCrae, 2011). In PISA 2018, student reading competence was the primary domain of testing. Starting from 2015, PISA included well-being measures in its framework, including students' overall life satisfaction measure and their school-related well-being, such as students' mental health, bullying experience, and students' belongings to schools. The 2018 cycle of PISA was the first large-scale international study to examine student well-being (OECD, 2019). Along with students' performance assessments, PISA collects contextual information from students, parents, and school administrators, including extensive demographic, family, and social information about students as well as their family background and school environment (OECD, 2019).

Approximately 710,000 students completed the PISA 2018 assessment, representing over 31 million 15-year-old students in the 79 participating countries and economies (OECD, 2019). The data was collected using a two-stage stratified sampling where schools were the primary sampling units and students as the secondary units (OECD, 2019; Yamamoto et al., 2019). Specifically, a minimum of 150 schools were selected in each country/economy, and a minimum of 35 students were selected within each school. The PISA 2018 data is available for download on OECD's website at

<https://www.oecd.org/pisa/data/2018database/>

This study utilized the PISA 2018 data from China – including four provinces that are Beijing, Shanghai, Jiangsu, Zhejiang – to empirically explore migrant students' school-

related well-being at the middle school level.

Data Rationale

PISA 2018 is well suited to this study for two reasons. First, PISA 2018 collected information related to this study's main interest—student well-being. Since 2015, PISA data has included student well-being construct in its questionnaires, asking students about their overall attitude towards life and their school experience (PISA, 2015). In PISA 2018, the student survey specifically asked students about their mental health, including their depression and anxiety level in schools, whether students had experienced bully victimization within schools, and whether they feel belonged to schools (OECD, 2019). This information is unique to the PISA dataset and provides the opportunity to explore the experiences of migrant students in schools in terms of their well-being. Further, PISA 2018 collected detailed information regarding students' birthplace and their parents' birthplace, enabling this study to distinguish the migration status of students. Additionally, PISA 2018 includes a school type variable that enables researchers to differentiate between public schools and private schools. Thus, it is possible to narrow down the sample to students enrolled in public schools and compare the well-being of migrant students and local students in the public school system.

Second, the four regions in China that participated in PISA 2018—Beijing, Shanghai, Jiangsu, Zhejiang—are suitable regions for studying educational issues related to migrant students. While other international datasets, such as TIMSS, have also included data from China, it is important to mention that provinces such as Hong Kong and Macao have very different politico-economic and educational systems compared to mainland China. The household registration policy is also different in Hong Kong and Macao compared to

mainland China. Provinces such as Hong Kong and Macao have a very different migrant-urban dynamic than provinces in mainland China, such as Shanghai and Beijing. The four provinces included in PISA 2018, although they do not represent the whole country, are considered as well-developed regions in China and thereby serve as primary destinations for migrant workers and their families (Du & Li, 2010; Xu & Dronkers, 2016). In this case, using these four regions included in PISA 2018 to explore migrant students' school-related well-being can provide valuable insight into future policymaking and social development for the entire country regarding the educational issues of migrant children.

Data Sample

The analytic sample included all students in China (B-S-J-Z) that participated in PISA 2018. The China (B-S-J-Z) from PISA 2018 contains a sample of 11,989 15-year-old participants from 361 middle schools, representing approximately 992,302 15-year-old students in Beijing, Shanghai, Jiangsu, and Zhejiang in China (OECD, 2018). PISA adopts a two-stage stratified sampling method, and student-level and school-level weights are provided by PISA to conduct analyses whose results can be generalized to students in these four provinces in China. In regression analysis, student- and school-level weights were incorporated to ensure that each sampled student and school in China dataset represented the correct number of students and schools in the population. The study excluded students who do not have migration status information—0.86% of students do not have migrant information and have been dropped in the analysis. Students who enrolled in private, non-government registered schools were also excluded as these schools employ different screening processes when recruiting students compared to public schools (S. Liu et al., 2017). The final analytic sample included 10,262 students enrolled in 310 public schools in

the four regions in China.

The missing percentage for all variables varies from 0% to 0.31% (school size) among all variables in the analysis. To correct for missing values in the data, this study used multiple imputations (MI) by creating 20 imputed datasets using software STATA and averaging the results across these datasets for the final estimates using the procedures described by King and colleagues (King et al., 2001). To account for the multilevel structure of PISA data, this study used student-level weights (W_FSTUWT) and school level weights (W_SCHGRNRABWT) provided by PISA during the imputation process. To fit the multilevel structure of the data, this study used the *xtmixed* function in STATA in the regression estimations.

Variable Definitions

Dependent Variables

The dependent variable of this study is student well-being, which was measured separately by three different variables: student mental health, bullying experience, and sense of belonging. These variables were index created by PISA 2018. This study adopted the index of these three variables created by PISA and used as dependent variables.

Student mental health was constructed based on students' self-report of how frequently they feel happy, lively, proud, joyful, scared, miserable, afraid, and sad in schools. Questions such as "how frequently do you feel joyful"; "how frequently do you feel cheerful"; "how frequently do you feel happy" were used in this question. Students' responses were combined to create an index with mean of 0 and standard deviation of 1. A higher score on this index indicates that the student has a more positive level of mental health. The reliability scale of student mental health variable is 0.80.

Student sense of belonging was constructed using students' responses to a trend question about their belongings to schools. This index was constructed by PISA based on questions such as "I feel like an outsider at school"; "I make friends easily at school"; "I feel awkward and out of place in my school"; "I feel lonely at school". Several of the items under the sense of belonging construct were reversed-coded so that positive values on this scale mean that students reported a greater sense of belonging at school. This index has a mean of 0 and a standard deviation of 1 across OECD countries (OECD, 2019). The reliability scale of student sense of belonging variable is 0.82.

School bullying experience was also an index created by PISA 2018 based on the following questions: "Other students left me out of things on purpose"; "Other students made fun of me"; "I was threatened by other students"; "Other students took away or destroyed things that belong to me"; "I got hit or pushed around by other students"; and "Other students spread nasty rumors about me". This index has a mean of 0 and a standard deviation of 1 across OECD countries (OECD, 2019). In other words, a positive value in this index indicates that the student is more exposed to bullying at school than the average student in OECD countries; negative values in this index indicate that the student is less exposed to bullying at school than the average student in OECD countries. The reliability scale of student bullying experience is 0.74.

These variables were constructed by PISA based on a series of related questions which are grouped on theoretical basis and previous research. The three indexes were constructed by PISA based on all students from equally weighted countries and economies. As mentioned by PISA 2018 report, these indexes were constructed in two stages—they were first scaled using a two-parameter item-response model and were then standardized so

that the mean of the index value is zero and standard deviation is one for all OECD countries.

Migration Status

The main variable of interest is whether a student is a migrant in the region of the student's school. Since PISA data does not provide a direct measure of students' hukou registration information, the information on student migration status is constructed based on birthplace information. While using birthplace as a measure of migrant status has been commonly used in international migration studies (Alesina et al., 2016; Sanchez-Vaznaugh et al., 2008), using birthplace as a measure for students' migrant status needs further clarification in the Chinese context due to the hukou policy (Xu & Dronkers, 2016). Acknowledging that hukou is heredity in nature, migrant students—regardless of their birthplace—tend to follow their parents' hukou registration, which was registered in their birthplace (Montgomery, 2012). While it is not impossible for migrant families to obtain a hukou in their host city, students from migrant families are identifiable from their local peers due to characteristics such as dialect accent, and customs (Mu & Jia, 2016). Following previous studies, this study utilized an individual's parents' birthplace information to construct their migrant status (Zhu, 2012; Han et al., 2015; Xu & Dronkers, 2016). In this case, a measure of migrants based on parental birthplace can be a mix of migrants who may or may not have obtained a local hukou. Therefore, in this study, the word migrant is used to denote 15-year-old students who have both parents born outside the respective city but in Mainland China; local students refer to students who were born in the respective city with at least one parent also born there. In other words, migrant students in this study capture first- and second-generation students from families that have migrated

from other provinces to the four large provinces—Beijing, Shanghai, Jiangsu, Zhejiang—in China.

This variable was coded as 1 when the student is a migrant and 0 when the student is local in the region. In China, a student can register hukou following the student's parents' hukou status. For example, a student can register hukou status in Beijing if at least one parent has a Beijing hukou status. On the other hand, even though a student was born in Beijing, the student would not be able to obtain a Beijing hukou if neither parent had a Beijing hukou. Therefore, the variable migrant status was created based on the birthplace of the student's father (COBN_F) and mother (COBN_M). For students with at least one parent born in the same province as the PISA test-taking province, the student was considered local and coded as 0. For students with no parents born in the same province as the PISA test-taking province, the student was considered a migrant and coded as 1. Among students who were coded as local, around 76% of students were found to have both parents born in the same province as the PISA test-taking province, and 24% were found to have only one parent born in the same province as the PISA test-taking province. A student's migrant status was assigned missing when both parents' birthplace was missing. Considering that Hong Kong, Macau, and Taiwan have different hukou registration systems compared to mainland China, students with parents' birthplaces such as Hong Kong, Macau, and Taiwan were dropped from the analysis. In other words, 0.8% of the students who have hukou outside mainland China were excluded; among the rest, 78% were identified as local students and 22% as migrant students. The percentage of migrant students identified in this study is quite close to other studies investigating issues related to migrant students in China. For instance, in Zhu (2012) where the researcher has utilized

PISA 2012 to explore migrant students' academic performance, the researcher identified approximately 26% of migrant students in Shanghai based on information about their parents' birthplace. In Xu and Wu (2016) where the researchers used the Chinese Educational Panel Survey to investigate migrant students' academic achievement, the researchers identified approximately 27% of migrant students in the data. Compared to the latest census data from China (China Labor Bulletin, 2021), on average, large urban cities have more than 30% of migrant students. Therefore, it is important to acknowledge that this identification strategy of migrant students in PISA data may not fully capture all students with migrant status.

Migrants Composition in School

This variable refers to the actual concentration of migrant students in each school. It was derived from the number of migrant students in each school divided by the number of students in that specific school. Considering that private schools have different recruiting procedure compared to public schools in China, this variable was only calculated for schools that were identified as public school in the dataset. This variable was created as a proxy to estimate the concentration of migrant students in public schools.

Covariates

According to OECD (2019), PISA 2018 explored the impact of student characteristics and school context on student educational outcomes. By controlling for student background and school contextual characteristics, it is possible to shed light on the relative impact of policy-amenable school characteristics (OECD, 2019). PISA collected several student demographic and school contextual characteristics, which were used as covariates for this study. These included a variable of student SES—students' Economic,

Social and Cultural Status (ESCS), Gender, Language Spoken at Home, Student immigration status², School Size, and School Location (small town, middle city, large city). A squared term for ESCS and school size were also included as covariates in this study. PISA used multilevel modeling in its summary report (OECD, 2015), which also included these variables as covariates. Aside from the covariates used by PISA (OECD, 2015) in their summary report, the present study also included a measure of student academic performance—a composite measure created based on the ten plausible values from PISA 2018 data for all three subjects (Reading, Mathematics, Science). Students’ academic performance was added as a student-level covariate due to the concern that students who struggle with their academic work are more likely to suffer from mental health issues (Chang et al., 2019). Considering that this study focuses on students’ migration status, this study included the proportion of migrant students in schools as a school-level covariate.

Data Analysis

This study analyzed data with Hierarchical Linear Modeling (HLM). HLM is a data analytical technique employed to address data in hierarchical structures (Raudenbush & Byrk, 2002). Compared to simple and multiple linear regression, HLM is a more advanced form of regression that can account for within-group dependency in a nested data structure. In other words, HLM can provide a more accurate estimation of standard errors when using nested or structured data (Raudenbush & Byrk, 2002; Snijders & Bosker, 1999).

PISA data has a hierarchical nature as students are nested within schools with the

² Immigration status was dropped in the analysis as there was no variation in the China data from PISA 2018. In other words, all students in China data are identified as non-immigrant students.

same resources and facilities. Traditional regression analysis assumes that observations are independent of each other (Aguinis & Gottfredson, 2013). However, this fundamental assumption is violated in the presence of hierarchically structured data such as PISA, where students are nested within schools, and students enrolled in the same school tend to be more similar to each other as they share similar school resources and curriculum design. In this case, traditional regression analysis that treats all students as independent cases is likely to produce standard errors that are too small, which will, in turn, result in a higher probability of rejection of a null hypothesis and inflated type I error (Luke, 2004; Osborn, 2000). Therefore, to avoid such errors and analyze variance in outcome variables at multiple hierarchical levels, HLM is an appropriate approach to analyzing hierarchically structured PISA data.

First of all, unconditional models without predictors were used to calculate intraclass correlations (ICCs) for each of the three measures under students' school-related well-being (mental health, bullying experience, and sense of belonging). ICCs were used to evaluate the proportion of variance attributable at the school level. The null model is as follows:

Level 1: Student

$$Y_{ij} = \beta_{0j} + \varepsilon_{ij} \quad (1)$$

Level 2: School

$$\beta_{0j} = \gamma_{00} + u_{0j} \quad (2)$$

where Y_{ij} denotes the measure of student school-related well-being (mental health, bullying experience, sense of belonging to schools) for student i in school j . β_{0j} is the mean

student well-being for school j ; ε_{ij} is the residual effect that reflect student i difference around the mean score of school j ; γ_{00} is the grand mean of student well-being scores across all schools. u_{0j} is the specific effect of school j .

Full models were conducted for each research question. All student-level predictors were entered at Level 1 and school-level predictors were entered at Level 2.

Research Question 1. The following model was utilized in this study for two-level regression results:

Level 1: Student

$$Y_{ij} = \beta_{0j} + \beta_{1j} \text{Migrant Student} + \beta_{xj} \mathbf{X}_{ij} + \varepsilon_{ij} \quad (1)$$

Level 2: School

$$\beta_{0j} = \gamma_{00} + \gamma_{0w} \mathbf{W}_j + u_{0j} \quad (2)$$

where Y_{ij} denotes the score on one of the well-being outcomes for student i in school j . *Migrant Student* represents the migration status of the student (1 for migrant students). β_{1j} denotes the mean differences of student well-being measure between migrant and local students. \mathbf{X}_{ij} represents a vector of the student level covariates which include ESCS, gender (1 for female), language spoken at home (1 for test language not the same as home spoken language), and student average academic achievement constructed by PISA test scores of Math, Reading, and Science. \mathbf{W}_j is a vector of school contextual covariates, which includes school size, school ESCS, and whether school is located in small town or large city (a middle-sized town with the population of 15,000 to 100,000 as reference). γ_{0w} is the coefficients of school-level covariates. u_{0j} demotes the school-level variability in intercept for migrant status.

Research Question 2. The following model was utilized in this study for two-level regression results for the second research question:

Level 1: Student

$$Y_{ij} = \beta_{0j} + \beta_{1j} \text{Migrant Student} + \beta_{xj} \mathbf{X}_{ij} + \varepsilon_{ij} \quad (1)$$

Level 2: School

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \mathbf{Migrant Composition} + \gamma_{0j} \mathbf{W}_j + u_{0j} \quad (2)$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} \mathbf{Migrant Composition} + \gamma_{1j} \mathbf{W}_j + u_{1j} \quad (3)$$

$$\beta_{xj} = \gamma_{x0} \quad (4)$$

where variable *Migrant Composition* depicts the proportion of migrants in a school, which is calculated by the number of migrant students divided by the total number of students in the specific school. The model for research question 2 builds on the model in research question 1 by adding across-level interaction effect between migrant status and migrant composition variables. This model was used to test the hypothesis that the relationship between migrant status and student school-related well-being differs by school migrant student composition.

In summary, this study applied multilevel modeling used the basic control variables adopted by the PISA 2018 assessment and analytical framework (OECD, 2018), including students' socioeconomic status, squared term of socioeconomic status, language spoken at home, gender, school size, squared term of school size, and school mean socioeconomic status to examine the issue of student well-being in China, especially on migrant students. Specifically, three measures are adopted under student school-related well-being: students' mental health, bullying experience, and sense of belonging to schools. This study also examined whether the composition of migrant student in schools influences the relationship

between students' migrant status and their well-being.

Chapter 4 Research Results

The purpose of this dissertation is to examine the well-being gap between migrant and local students, as well as the role of school migrant composition in this well-being gap. Specifically, well-being is measured by students' mental health, bullying experience, and sense of belonging to schools. After a presentation of the descriptive statistics, this chapter presents the results based on the China portion dataset (Beijing, Shanghai, Jiangsu, and Zhejiang) of the PISA dataset to answer the following questions:

- (1) Is there a well-being gap between 15-year-old migrant and urban resident students in China (Beijing, Shanghai, Jiangsu, Zhejiang)?
- (2) What is the association between migrant composition of a school and migrant students' well-being?

Descriptive Statistics

The descriptive statistics of the independent and dependent variables used in both student and school level analyses are presented in Table 1. Table 1 includes the means, the standard deviations, and the minimum and maximum values for each variable. Student characteristics included students' economic, social and cultural status, gender, language spoken at home, migrant status, and academic achievement. Among these variables, students' gender, language spoken at home, and migrant status were dichotomous variables. Students' economic, social and cultural status was an index created by PISA that has a mean of 0 and standard deviation of 1. Student academic performance was created based on all 10 plausible values provided PISA on three subjects. Specifically, an average score for each subject, Reading, Mathematics, and Science that was tested by PISA 2018, was created, and then a students' academic performance score was created based on an average

of those three scores. The academic performance score was then standardized, with a mean of 0 and a standard deviation of 1. A squared term of student economic, social, and cultural status was created as one of the basic control variables at the student level following the methodology used by PISA in their own reports (see for e.g., OECD, 2015). School characteristics included school mean economic, social, and cultural status, school size, and school location. The value of school size was divided by 100 for the ease of interpretability of model coefficients. A squared term of school level economic, social and cultural status, and a squared term of school size were also included following the approach used by PISA's in their own analyses (OECD, 2015). Other variables at the school level were kept in their original scales. The proportion of migrant students in a school was also included as one of the school level variables.

Overall, the analytic sample included 10,262 students in 310 public schools, from the four regions in China. Each school, on average, had 33 students. Among the 10,262 students, 8,070 were identified as local students, and 2,192 students were identified as migrant students—therefore, 21.18% students of the analytic sample were migrant students.

Table 1

Descriptive statistics of variables in the study

Variable	Mean	<i>SD</i>	Min	Max
Well-being				
Mental Health	0.07	0.89	-3.52	1.27
Sense of belonging	-0.24	0.91	-3.64	2.75
Bullying victimization	-0.23	0.87	-0.78	3.96
Student-level characteristics				
Economic, social and cultural status	-0.44	1.07	-5.08	2.94
Economic, social and cultural status Squared	1.31	1.65	0.00	25.78
Female	0.49	0.50	0.00	1.00

Test Language (same as home language=1, different=0)	0.32	0.47	0.00	1.00
Migrant (migrant=1, urban=0)	0.21	0.41	0.00	1.00
Academic performance	0.01	1.00	-3.85	2.58
School-level characteristics				
Economic, social and cultural status	-0.39	0.72	-2.04	1.03
Economic, social and cultural status Squared	0.67	0.78	0.00	4.18
Proportion of migrant students	0.21	0.19	0.03	0.94
School size	18.27	12.74	0.78	82.88
School size squared	496.18	814.76	0.61	6869.09
School location (small town)	0.23	0.42	0.00	1.00
School location (large city)	0.61	0.49	0.00	1.00

The descriptive statistics showed that students in the four regions in China on average had a measure of 0.07 on the index of mental health, a measure of -0.24 on the measure of school sense of belonging, and a measure of -0.23 on the measure of school bullying victimization experience. Given that the measures were standardized by PISA (see OECD, 2019), so that the means of the three measures for OECD countries was 0, we can interpret these values as showing that students enrolled in public schools in China showed a higher measure on mental health, a lower measure on school sense of belonging, and a lower measure on school bullying victimization compared to the OECD averages in the PISA 2018 data.

At student level, students who enrolled in public schools in China reported a lower ESCS average compared to the average of OECD countries. Regarding gender distribution, female and male students were about evenly distributed, each accounting for approximately half of the sample population. Regarding student language spoken at home, around 32% of students were tested in the same language that they spoke at home. In terms of migrant

students' percentage, the 2,192 migrant students accounted for approximately 21% of the sampled student population, which was lower than the 30% of migrant students reported by the latest census data from China (China Labor Bulletin, 2021).

At the school level, descriptive statistics revealed that most of the schools, approximately 61%, were located in large urban city school districts. Schools varied considerably in their proportion of migrant students; while some schools had around 2% of migrant students, others had as much as 93.94% of migrant students.

In order to show a broad picture of migrant and local students in the four regions in China, Table 2 presents the mean comparisons for all variables, grouped by students' migrant status.

Table 2

Mean of variables in study by migrant status

Variable	Local Students (N=8,070)		Migrant Students (N=2,192)	
	Mean	SD	Mean	SD
Well-being				
Mental Health	0.11	0.89	-0.09	0.91
Sense of belonging	-0.23	0.91	-0.28	0.93
Bullying victimization	-0.25	0.87	-0.16	0.87
Student characteristics				
Economic, social and cultural status	-0.43	1.03	-0.27	1.22
Economic, social and cultural status Squared	1.24	1.58	1.57	1.84
Female	0.49	0.50	0.46	0.50
Test Language (same as home language=1, different=0)	0.35	0.47	0.22	0.41
Academic performance	-0.01	0.96	0.07	1.12
School characteristics				
School mean socioeconomic status	-0.45	0.68	-0.17	0.78
School mean socioeconomic status squared	0.67	0.80	0.64	0.74

Proportion of migrant students	0.17	0.15	0.37	0.20
School size	18.54	12.59	17.29	13.24
School size squared	502.19	807.06	474.00	842.34
School location (small town)	0.25	0.43	0.18	0.39
School location (large city)	0.57	0.50	0.75	0.43

Table 2 shows that on average, migrant students were lower than their local peers on the measure of mental health and sense of belonging to schools; migrant students were higher than their local peers on the measure of school bullying victimization. With respect to students' economic, social and cultural status (ESCS), the average for local students was -0.43, whereas the average for migrant students was -0.27. This is consistent with a recent report from Wu (2020) that large urban cities in China, such as Beijing and Shanghai, are attracting migrant people who have economic capability—those who can invest in local businesses, buy a home, or hold a qualified job, while pushing out migrants with relatively lower socioeconomic status or educational level. In other words, migrant people who are more financially capable are more welcomed to migrate into in large urban cities.

At the school level, Table 2 suggests that migrant students tend to attend schools that had a higher percentage of migrant students than their local counterparts—migrant students typically attended schools where there were approximately 37% migrant students, whereas urban students usually went to schools with an average of 17% migrant students. With respect to gender distribution, Table 2 indicates that migrant and urban students did not attend schools with large discrepancies in proportion of female students—local students attended schools with an average of 49% female students, and migrant students attended schools with an average of 46% female students. In terms of school location, Table 2 indicates that migrant students tend to attend schools that located in large cities—for migrant students, approximately 75% of them went to schools in large cities, whereas

approximately 57% of non-migrant students attended schools in large cities.

Table 3 is presented to show the descriptive statistics on variables based on the distribution of school percentage of migrant students. Quartile 1 contains the first 25 percentiles of school migrant percentage; Quartile 2 represents the 25 to 50 percentiles of the school migrant percentage; Quartile 3 represents the 50 to 75 percentile of the school migrant percentage; and Quartile 4 represents the last 25 percentile of the school migrant percentage. Among the 310 public schools in the analytic sample, 75 schools were in Quartile 1, 77 schools were in Quartile 2, 76 schools were in Quartile 3, and 82 schools were in Quartile 4. More than half of the schools in the analytic sample had a percentage of migrant students that is less than 25%.

Table 3

Descriptive Statistics by Quartiles of School Percentage of Migrants

Variable	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Well-being				
Mental Health	0.10	0.13	0.09	-0.06
Sense of belonging	-0.37	-0.35	-0.20	-0.05
Bullying victimization	-0.19	-0.22	-0.27	-0.23
Student characteristics				
Economic, social and cultural status	-0.81	-0.56	-0.33	-0.06
Economic, social and cultural status Squared	1.65	1.30	1.11	1.18
Female	0.49	0.49	0.49	0.47
Test Language (same as home language=0, different=1)	0.50	0.33	0.23	0.20
Migrant (migrant=1, urban=0)	0.03	0.11	0.23	0.48
Academic performance	-0.13	-0.12	0.06	0.21
School characteristics				
Economic, social and cultural status	-0.80	0.53	-0.29	0.03
Economic, social and cultural status Squared	0.94	0.64	0.47	0.62
Proportion of migrant students	0.03	0.11	0.24	0.48

School size	19.72	20.11	16.65	16.60
School size squared	498.87	620.31	424.54	439.86
School location (small town)	0.28	0.32	0.19	0.13
School location (large city)	0.36	0.53	0.66	0.87
Number of students	75	77	76	82
Number of schools	2530	2579	2550	2603

As shown in Table 3, the descriptive statistics suggests that as school's percentage of migrant students gradually increased, the overall measure of student mental health decreased; the overall measure of student sense of belonging to schools increased in general; the measure of student bullying victimization experience decreased slightly.

Unconditional Model

A two-level unconditional model was first developed to estimate the intra-class correlation (ICC) for the three outcome measures. Table 4 presents the partitioned total variance for the three outcome variables into between- and within-school components.

Table 4

Random effects in null model across well-being measures

Variance	Mental Health	Sense of belonging	Bullying
Between-school variability	0.06	0.10	0.03
Within-school variability	0.76	0.74	0.76
ICC (%)	6.75	11.53	3.87

The ICC represents the proportion of variation in the dependent variables that is accounted for by clustering. In other words, it is the proportion of variation in student well-being outcomes that is accounted for at the school level. The estimates of between- and within-school variance reported in Table 4 suggests small variation at the school level in student well-being across schools in the four regions in China. Intra-class correlation for student mental health, sense of belonging, and bullying victimization experience was 0.068,

0.115, and 0.039, indicating that 6.75%, 11.53%, and 3.87% of the total variance in mental health, sense of belonging to schools, and bullying victimization experience respectively, can be attributed to variation between schools in the four regions in China.

Research Question 1

The first research question in this study aimed to explore whether there is a well-being gap between migrant and local students attended public schools in the four regions in China. Student well-being included three measures—student mental health, sense of belonging to schools, and bullying victimization experience. The results showed that there was a significant well-being gap between migrant and local students on all three measures. Table 5 presents results from regression models that included student migrant status as the single student-level predictor. Regarding student mental health, Table 5 Column (1) shows that migrant students were 0.13 point lower than their local peers in public schools ($p < 0.001$). For student sense of belonging to schools, Table 5 Column (2) shows that migrant students were 0.21 point lower than their local peers in public schools ($p < 0.001$). For student bullying victimization, Table 5 Column (3) shows that migrant students were 0.13 point higher than their local peers in public schools ($p < 0.001$). The results indicate that migrant students had lower mental health and sense of belonging compared to their urban peers, and experience more bullying victimization in schools.

Table 5

Well-Being Gap between Migrant and Local Students

Variables	(1) Mental Health		(2) Sense of belonging		(3) Bullying	
	β	s.e.	β	s.e.	β	s.e.
Migrant (migrant=1, local=0)	-0.13***	(0.01)	-0.21***	(0.01)	0.13***	(0.01)
Intercept	0.09***	(0.01)	-0.19***	(0.02)	-0.26***	(0.01)

R-squared			
Level-1	0.01	0.01	0.01
Level-2	0.09	0.15	0.03

Student- and school-level control variables were then incorporated into the regression models (see Table 6). Regarding student mental health, Table 6 Column (1) shows that migrant students were 0.11 point lower than their local peers in public schools in the measure of mental health ($p<0.001$), after holding other student level and school level variables constant.

Regarding student school sense of belonging, Table 6 Column (2) shows that migrant students were 0.18 point lower than their local peers in public schools in the measure on sense of belonging to schools ($p<0.001$), holding other student level and school level variables constant.

Regarding student bullying victimization experience, Table 6 Column (3) shows that migrant students were 0.11 point higher than their local peers in public schools in the measure on bullying victimization experience ($p<0.001$), holding other student level and school level variables constant.

Table 6

Well-Being Gap between Migrant and Local Students with Covariates

Variables	(1)		(2)		(3)	
	Mental Health		Sense of belonging		Bullying	
	β	s.e.	β	s.e.	β	s.e.
Student Characteristics						
Migrant (migrant=1,local=0)	-0.11***	(0.01)	-0.18***	(0.04)	0.11***	(0.01)
Socioeconomic Status	0.03***	(0.00)	0.09***	(0.03)	0.00	(0.00)
Socioeconomic Status squared	-0.01***	(0.00)	-0.01	(0.02)	0.01***	(0.00)
Female	0.18***	(0.01)	-0.04	(0.03)	-0.31***	(0.01)

Test Language	0.01	(0.00)	0.03	(0.03)	0.04***	(0.00)
Academic performance	0.02***	(0.00)	0.10***	(0.03)	-0.04***	(0.00)
School characteristics						
School mean SES	-0.08***	(0.03)	-0.01	(0.07)	-0.03	(0.02)
School mean SES squared	-0.05*	(0.02)	0.03	(0.07)	-0.02	(0.02)
School size	0.00	(0.00)	-0.02***	(0.00)	0.01***	(0.00)
School size squared	0.00	(0.00)	0.00***	(0.00)	-0.01***	(0.00)
School location (Small town)	0.01	(0.04)	0.01	(0.04)	0.03	(0.03)
School location (Large city)	-0.07*	(0.03)	0.13**	(0.05)	0.00	(0.03)
Intercept	0.05	(0.04)	0.02	(0.08)	-0.23***	(0.04)
R-squared						
Level 1	0.02		0.04		0.04	
Level 2	0.16		0.16		0.15	

Note. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Binary variables (migrant status, female, test language) are not standardized.

Research Question 2

The second research in this study aimed to explore whether the well-being gap between migrant students and their local peers varies by the proportion of migrant students in schools. Specifically, whether the gap between migrant and local students on the measure of mental health, school sense of belonging, and bullying victimization is associated with the school proportion of migrant students. The results showed that the migrant composition of a school played a role in students' mental health and school sense of belonging, but not bullying victimization. Results are presented in Table 7.

Regarding student mental health measure, Table 7 Column (1) shows that the within-school mental health gap between migrant and local students was no longer significant after controlling for percentage of migrant students—indicating that within a school, there was no difference between migrant and local students on the measure of mental health. The

proportion of migrant student in schools was found to be negatively related to student mental health. Specifically, when the proportion of migrant student in school increased from 0 to 1, student mental health decreased by 0.17 point ($p < 0.05$). This negative relationship was stronger for migrant students, indicating that the higher proportion of migrant students were especially associated with lower measure on mental health for migrant students than local students. Specifically, when school migrant proportion changed from 0 to 1, migrant students were found to have an additional 0.41 points decrease on mental health measure. In other words, a 10 percent increase in school migrant composition was found related to a 0.04 point additional decrease on migrant students' mental health. Figure 1 displays the relationship between students' mental health gap and the school migrant proportion. I used the likelihood ratio test to compare this model with the fixed-slope model used in research question 1. The model including cross-level interaction was a better fit, $\chi^2 = 6103.78$, $p < 0.001$.

Regarding students' school sense of belonging, Table 7 Column (2) shows that, within school, there was still a school sense of belonging gap between migrant and local students—migrant students were found to be 0.28 points lower compared to their local peers on the measure of school sense of belonging. With respect to school-level variables, school migrant proportion was found to be significantly and positively related to student school sense of belonging. Specifically, when the proportion of migrant student in school increased from 0 to 1, the measure on student sense of belonging to schools increased by 0.27 point. This positive relationship was stronger for migrant students, indicating that higher proportion of migrant students in school was especially associated with student school sense of belonging for migrant students than local students. Specifically, when

school migrant proportion changed from 0 to 1, migrant students were found to have a 0.43 more point on school sense of belonging measure compared to local students. In other words, as 10 percent increase in school migrant composition was found related to a 0.04 point additional increase in migrant students' school sense of belonging. Figure 2 displays the relationship between students' school sense of belonging gap and the school migrant proportion. I used the likelihood ratio test to compare this model with the fixed-slope model used in research question 1. The model including cross-level interaction was a better fit, $\chi^2=4858.43, p<0.001$.

Regarding students' bullying victimization experience, Table 7 Column (3) showed that, within schools, the gap between migrant and local students' measure on bullying victimization experience was no longer significant, after controlling for proportion of migrant students. It is also important to report that, at the school level, the school proportion of migrant student was not statistically significant in predicting the slope of migrant students' bullying victimization experience. These results suggested that the relationship between students' migrant status and their bullying victimization experience in schools did not vary by the school proportion of migrant students. I used the likelihood ratio test to compare this model with the fixed-slope model used in research question 1. The model including cross-level interaction was a better fit, $\chi^2=4868.35, p<0.001$.

Table 7

The Role of School Migrant Proportion in Migrant-Urban Students' Well-Being Gap

Variables	(1)		(2)		(3)	
	Mental Health		Sense of belonging		Bullying	
	β	s.e.	β	s.e.	β	s.e.
Student characteristics						

Migrant status (migrant=1,local=0)	-0.10	(0.11)	-0.28**	(0.02)	0.03	(0.15)
Socioeconomic Status	0.02***	(0.00)	0.10***	(0.00)	0.01	(0.00)
Socioeconomic Status Squared	-0.01***	(0.00)	0.01***	(0.00)	0.01***	(0.00)
Female	0.18***	(0.01)	-0.05***	(0.00)	-0.31***	(0.00)
Test language Academic performance	0.01	(0.01)	-0.01*	(0.00)	0.03***	(0.00)
	0.02***	(0.00)	0.06***	(0.00)	-0.04***	(0.00)
School characteristics						
Migrant Proportion	-0.17*	(0.08)	0.27**	(0.10)	-0.04	(0.07)
School mean SES	0.01	(0.03)	0.01	(0.04)	-0.04	(0.02)
School mean SES squared	0.01	(0.03)	0.01	(0.02)	-0.04	(0.02)
School size	0.00	(0.01)	-0.01***	(0.00)	0.01**	(0.00)
School size squared	0.00	(0.00)	0.00**	(0.00)	0.00**	(0.02)
School location (small town)	-0.09	(0.09)	0.00	(0.09)	-0.09	(0.10)
School location (large city)	-0.11	(0.08)	0.01	(0.08)	-0.03	(0.09)
Cross-level interaction (x Migrant)						
Migrant Proportion	-0.41*	(0.18)	0.71***	(0.17)	-0.09	(0.18)
School mean SES	-0.07	(0.06)	-0.01	(0.06)	0.03	(0.07)
School mean SES squared	-0.08	(0.06)	0.01	(0.05)	0.13*	(0.06)
School size	-0.01	(0.01)	-0.01	(0.01)	0.01	(0.01)
School size squared	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
School location (Small town)	0.14	(0.10)	0.03	(0.09)	0.11	(0.11)
School location (Large city)	0.06	(0.08)	0.05	(0.07)	0.03	(0.10)
Intercept	0.06	(0.05)	-0.14*	(0.06)	-0.19***	(0.05)
R-squared						
Level 1	0.03		0.04		0.04	
Level 2	0.25		0.22		0.12	

Note. Standard errors in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001. Binary variables (migrant status, female, test language) are not standardized.

Figure 1

Student Mental Health Gap and School Migrant Proportion

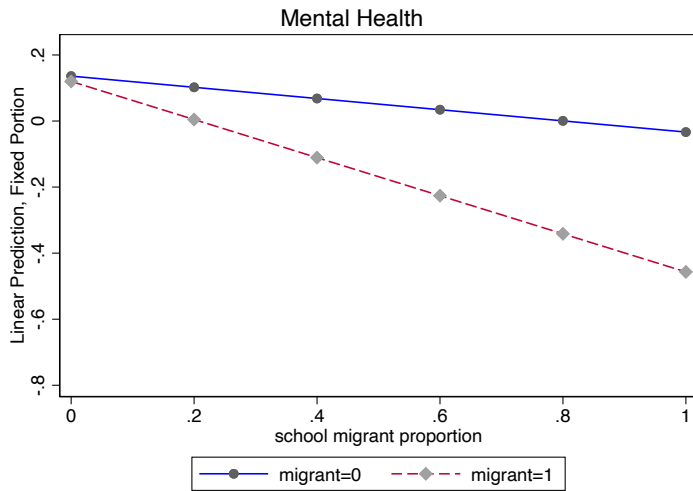
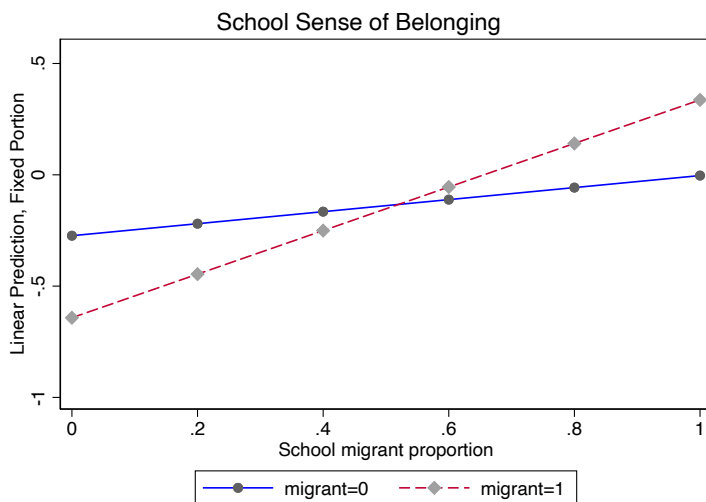


Figure 2

Student Sense of Belonging Gap and School Migrant Proportion



Summary

This chapter reported the descriptive statistics for all variables included in the study, and also reported the results based on the regression model for both of the research questions. First, the results suggested that there existed a significant well-being gap—based on the measure of mental health, sense of belonging to schools, and bullying victimization experience—between migrant and local students enrolled in public schools of the four

regions (Beijing, Shanghai, Jiangsu, Zhejiang) in China based on PISA 2018 data.

Compared to students who are local residents, migrant students were found to have a lower measure on mental health and school sense of belonging, and a higher measure on bullying victimization experience. This well-being gap between migrant and local students existed even after controlling for student characteristics including economic, social, and cultural status, gender, language spoken at home, academic performances, and school characteristics including school size, school location, school mean economic, social, and cultural status. Second, the results suggested that the well-being gap between migrant and local students varied by migrant composition of the school, as measured by the proportion of migrant students within a school. Specifically, an increase in the school proportion of migrant students was found to additionally decrease migrant students' mental health; an increase in the school proportion of migrant students was found to additionally increase migrant students' school sense of belonging; the change in the school proportion of migrant students was found not related to migrant students' school bullying victimization experience.

Chapter 5 Discussion and Conclusion

This dissertation explored migrant students' well-being in public schools in China, utilizing the most recent representative dataset of PISA 2018, which contained 10,262 students enrolled in 310 public schools in four regions—Beijing, Shanghai, Jiangsu, and Zhejiang—of China. The four regions are relatively economically developed within China and with the largest migrant inflow (Shi et al., 2020). Therefore, PISA 2018 China data is suitable for exploring issues related to migrants in China. This dissertation sought to understand two research questions: first, is there a well-being gap between 15-year-old migrant and urban resident students in China? Second, what is the association between the migrant composition of a school and migrant students' well-being?

This dissertation originated out of concerns expressed in newspapers (Hernández & Zhao, 2017), educational research (Chen, 2014), and policy documents (W. Liang et al., 2019) in China related to migrant students' academic outcomes and well-being. Over the past two decades, the economic reform in China has led to the explosion of rural-to-urban migration (Guo, 2007). As a result of the central government's preferential policies in terms of economic development, metropolitan areas in China, such as Beijing, Shanghai, and Guangzhou, are more developed in every aspect compared to other areas in central or western China (Cao et al., 2018). Specifically, large urban cities located in the eastern coastal areas tend to have more job opportunities, better living conditions, and richer educational resources (Goodburn, 2009). Therefore, the number of people who migrated to large urban cities in China kept increasing over the last few decades (Loveless, 2013). Due to the hukou restriction, children who relocated with their parents to large cities were not fully granted access to public schools in their host cities—even among those who managed

to attend public schools, they were not given equal opportunities in educational opportunities such as national competition, award, and exam (Chen & Feng, 2019; Ling, 2015). Intending to provide equal public education to all students, in 2008, Shanghai started to open local public schools to migrant students, and similar policies were implemented in other large cities, such as Guangdong (Y. Chen & Feng, 2017; Li, 2020). Despite the large body of literature exploring migrant students' experience in migrant-specific schools (Liu & Laura, 2018; Lu & Zhou, 2013; Xu & Wu, 2016), migrant students' experience in public schools has not been thoroughly researched. Moreover, while scholars emphasized the importance of student well-being in recent years, literature on China's migrant students has largely centered on their academic achievement (Guo, 2011; Liang et al., 2019). More importantly, granting migrant students access to public schools does not mean that the educational gap between migrant and local students has been closed. Students' academic, mental, and psychological outcomes are essential factors that need to be considered in student development (Govorova et al., 2020). In other words, having the door of public schools opened to all students should be the starting point, rather than the ending point, of promoting education equity in China.

Extending our knowledge on migrant students' well-being is associated with promoting educational equity for all students due to the fact that well-being outcomes can have a long-term impact on students' life-long happiness and satisfaction (Dolan et al., 2008). While more and more migrant students are relocating with their families to urban cities (Wang & Teng, 2022), understanding the well-being gap between migrant students and their urban peers in public schools can help educators understand how to better support migrant students and provide necessary school services. Moreover, as educational policies

in China are moving away from segregating migrant and urban students in different types of schools (D. Li, 2020), understanding how the migrant composition of a school influences students' well-being can be of great significance for policymakers. Specifically, evidence supporting the benefits of integrating migrant and local students with regard to student well-being outcomes could be helpful in guiding these policies. Evidence showing negative influences related to school integration can help reveal aspects where further efforts are needed. Educators, school officials, and policymakers can use the findings from this dissertation to empower schools as an effective social and educational unit to narrow the educational gap between urban and migrant students, with an ultimate goal of providing accessible, high-quality education for all students under the current migration trend in China.

This dissertation utilized the China portion dataset from PISA 2018 and adopted two-level regression to analyze the multilevel structure of the data. Using a large-scale dataset overcame the limitations of previous studies on migrant students that used small-scale school samples (Chen & Feng, 2019; Li, 2020; Mu & Jia, 2016). Due to a lack of nationwide school-level data, previous studies in China on migrant children were either based on ethnographic observation (Goodburn, 2009; Tan, 2010) or focused on the analysis of census data with limited information on students' well-being outcomes (Guo, 2002; Liang & Chen, 2007; Wu & Zhang, 2015), failed to uncover migrant students' well-being in urban settings. While large cities have adopted policies providing public education to migrant children, no data are available regarding the effectiveness of such policies and migrant students' experience in public schools (Wong et al., 2009). To fill the literature gap, this dissertation utilized PISA 2018, which is generalizable in four regions of China

based on representative samples. The outcome variables for this dissertation were students' well-being, including their mental health, sense of belonging to schools, and bullying victimization experience, aiming to provide a holistic view of students' well-being.

This final chapter of the dissertation is composed of two parts. First, this chapter summarizes the findings of each research question and discusses the policy implications drawn from the findings for school and educational policies. Next, the second section discusses the limitations of this dissertation's limitations and directions for future research based on the limitations.

Discussion of Research Findings

The Well-being Gap between Migrant and Local Students

Before computing the regression results for the first research question, this study conducted an unconditional model to compute the ICC for the outcome variables. The study found that 6.75%, 11.53%, and 3.87% of the total variance in mental health, sense of belonging to schools, and bullying victimization experience respectively, can be attributed to variation between schools in the four regions in China. These results were generally aligned with the estimates reported by Govorova and colleagues (2020) where the researchers also utilized PISA data to explore the role of schools in students' well-being across 35 OECD countries. Govorova and colleagues (2020) utilized measures of social and emotional skills as indicators of student well-being, and found that in general, schools accounted for 5% to 9% of variance in student well-being, and this was consistent for all 35 OECD countries in PISA data.

The first research question focused on the well-being gap between migrant and local students in public schools in China, specifically on student mental health, sense of

belonging to schools, and bullying victimization experience. The question asked: Is there a well-being gap between 15-year-old migrant and local students in China in terms of their mental health, sense of belonging to schools, and bullying experience? Based on data from PISA 2018, the results of this dissertation showed that migrant students have significantly lower scores on well-being measures compared to their local peers in China. Students identified as migrant students were found to have lower scores on mental health and sense of belonging to schools compared to their local peers, and were found to experience more bullying victimization in schools. As Loveless (2014) stated, “the hukou system has a devastating impact on the lives of migrant children” (para. 7). While previous research has confirmed the achievement gap between migrant and local students (Ma et al., 2018; Wang et al., 2017), findings from this dissertation suggested that the hukou system also influences migrant students’ well-being in schools.

The findings from this dissertation echo general discussion in the international literature on immigrant students, where researchers found that conforming to new social rules and adapting to the new environment are associated with mental health risks (Alegría et al., 2017; Garcini et al., 2016). Similarly, when migrant students in China relocate with their parents to large urban cities, they also need to adjust themselves to the new environment, such as new school norms, new curriculum, dialects that are different from their hometown, and form new relationships with teachers and local students (Fang et al., 2016; Yuan et al., 2013). In other words, the process of migrant transition is increasingly recognized as much a psychological process than a sociological one (Virupaksha et al., 2014). Researchers from China have utilized small-scale data based on several schools in Beijing (Gao et al., 2015) and Shanghai (Wong et al., 2009) and found that migrant

students, overall, are more likely to have mental health problems such as anxiety or depression. This study contributes to the literature by using generalized data from four provinces in China and confirms that a mental health gap exists between migrant and urban students. Contrary to the findings from Gao and colleagues (2015), where the researchers found that among migrant students, those who enrolled in public schools had no difference in terms of depression and anxiety levels from their urban peers, this study found that a mental health gap between migrant and urban children does exist within public schools. One possible explanation is that attending the same school with local students may expose migrant children to more discrimination and unfair treatment (Guo, 2007), which, in turn, brings risks to students' mental health. Therefore, this study argues for more attention on caring about students' mental health in China—especially migrant students who are in the process of adjusting their life from their hometowns to host cities.

While the discussion of providing mental health services to students has existed for almost a decade in China (X. Chen, 2021; Wu et al., 2012), research has pointed out that there is no systematic program for developing student mental health across public schools (Yao et al., 2021). Although some public schools in Beijing and Shanghai have included mental health as part of their curriculum (Ni, 2021; Yan, 2021), in most circumstances, the classroom teachers (also known as *ban zhu ren*) are expected to take responsibility for mental health education and services, without having received any professional training before taking upon this role (Wang et al., 2015). Issues related to mental health are still a highly stigmatized subject in many parts of China that teachers and students do not openly talk about (Yin et al., 2020). In this case, support related to migrant students' mental health development is limited and rare. This study shows that attention to migrant students'

mental health would be necessary to consider when promoting educational equity within the public school system. As stated by the World Health Organization (2003), vulnerable and marginalized population groups require priority attention regarding mental health. For example, recently the United Kingdom has launched a school program named New Arrivals Excellence, that aims to help immigrant children who newly moved to the country adjust to their new school life, by focusing on the construction of shared values and school cohesion (Li & Jiang, 2018). While launching nationwide programs may take years in China, school districts in large urban areas, especially those that have enrolled many migrant students, can initiate district-wide or school-wide programs that help integrate mental health support for migrant students in schools. Services related to student mental health should be actively planned to enhance a more equitable and healthier school environment for students—specifically, by relieving the burden on migrant students that they need to cope with the new school environment in host cities by themselves.

This study also found that migrant students showed a lower sense of belonging to the public school they enrolled, compared to their local peers. As suggested by literature focusing on immigrant students, newcomers to a country or region often feel like an outsider as they leave behind well-established social support networks, such as family, friends, and community, upon migrating to their host place (Borgonovi & Ferrara, 2020; Chiu et al., 2016; Ham et al., 2017). In a similar vein, within China, the institutional barriers in society, such as exclusion in the social welfare system, is a constant reminder to migrant people that they are being treated differently and do not belong to the place. Moreover, as revealed by qualitative research, migrant students in China often experience intentional exclusion and discrimination from their local peers in schools and experience

lower expectations from their teachers (Mu & Jia, 2016). These experiences are likely reasons for migrant students to feel that they are not welcomed in schools and do not belong to the environment. Although many policies have been implemented in China to ensure equal opportunity for students in public school enrollment (see Guo & Zhao, 2019), migrant students are, in fact, “still a long way from being equals to local residents—together but unequal” (Wu & Wang, 2014, p.802). The feeling of not belonging to schools can be cyclical because students can have a negative experience about themselves or their identity within the school (Verhoeven et al., 2019). For migrant students, this may increase their anxiety in adjusting to the new school environment and exacerbate their feelings of being outsiders in both schools and society. Although the Chinese government has relaxed the hukou policy restriction in public education, findings from this study suggest that this does not automatically contribute to migrant students’ sense of belonging to schools. In other words, cultivating migrant students’ school belongings needs more than removing the hukou barrier in public education, but also creating an inclusive environment in public schools.

Moreover, it is important to mention that promoting migrant students’ belonging to schools involves contributions from both migrant and local students—while migrant students are adjusting themselves from their home culture to the new school environment, local students’ acceptance of them is of equal importance. Considering the fact that schools serve as the main space for migrant students to interact with their local peers, schools can play an important role in helping migrant students establish new social support networks that ultimately promote their sense of belonging to schools (Fredricks et al., 2004).

Unfortunately, public schools in China are still found to provide separate timetables or

separate classes for migrant students and their local peers, limiting interactions between these two groups of students (Qian & Walker, 2015). Therefore, in addition to providing migrant students with high-quality public education, it is necessary for schools to implement programs that help to build a relationship between migrant and local students, with a goal of raising the inclusiveness of schools. School leaders and educators should consider ways that can promote migrant students' inclusive experiences at schools and provide opportunities for migrant and local students to interact and build feelings of connectedness.

In terms of school bullying victimization experience, this study found that migrant students were more likely to experience school bullying victimization compared to their local peers. While previous research has revealed that migrant students tend to engage more in school bullying perpetration (Cui & To, 2019; 2020), this study explored the other side of the coin—migrant students are not only more likely to become bullying perpetrators but also bullying victims. Unfortunately, actions to eliminate school bullying are rare in China—teachers and parents in China, rather than viewing bullying incidents as activities that require intervention, tend to consider them as “small fights” between students (Wong, 2016). Even though school bullying cases have hit the newspaper headlines from time to time in China (S. Lu & Yu, 2015; Schleicher, 2016), the cases have not declined, and related intervention is under-investigated (Han et al., 2017). This study argues that more attention should be given to migrant students' school bullying issue, especially when more students are migrating with their parents from rural to urban cities with the hope of better education and life. In other words, school bullying prevention should be considered as part of culture building and climate development within schools (Romano, 2014; Swearer et al.,

2010). Additionally, although previous researchers have suggested that migrant students tend to engage in bullying perpetration due to their lack of opportunity to gain support from families and communities (Cui & To, 2019), mechanisms behind migrant students' involvement in bullying perpetration and victimization may be different. In other words, *future studies need further exploration of why* migrant students fall into bullying victims or perpetrators.

It is worth pointing out that the influence of being a victim of school bullying can be long-term—previous studies have found that school bullying experience can lead to more severe mental health issues or suicide even after students' graduation (Boden et al., 2016; Takizawa et al., 2014). Being a victim of school bullying at the age of 15 has been confirmed to predict higher levels of self-reported depressive symptoms throughout later adolescence and early adulthood, suggesting that the effects of bullying are severe and prolonged (Due et al., 2009). As stated by Li (2016), “physical wounds can heal with time, but mental trauma can continue causing pain for the rest of a bullying victim’s life” (para. 6). However, in China, no national or state-level data specifically document students' bullying experience in schools. Even across the globe, as mentioned by the United Nations, studies exploring the victimization of migrant and refugee children are still few (Caravita, 2016). Therefore, future research is encouraged to explore and reveal the social and psychological drivers of bullying against migrant students and how migrant students confront bullying in schools. More research should shed light on *who* serves as bullying perpetrators toward migrant students and *what* could be done to prevent this situation in schools. It is necessary to understand the issue of school bullying against migrant students before addressing this problem effectively.

Internationally, scholars have also demonstrated that school bullying is a major concern, and students with migrant, immigrant, or refugee backgrounds are more likely to be involved in school bullying (Mendez et al., 2012; Oppedal et al., 2016). Students who are viewed by peers as different or portrayed as exceptionalities are more likely to become the target of school bullying (Forsberg & Thornberg, 2016; Philips, 2007), which has been confirmed by studies from the United States (Maynard et al., 2016), Japan (Akiba, 2004), and some European countries (Alivernini et al., 2019; Ammermueller, 2012). Similar to racial or ethnic discrimination, bullying of migrant students is also a form of bias-based discrimination (Caravita, 2016). Students encounter bullying experiences as they are perceived to belong to a specific social group (Mulvey et al., 2018). A recent report from the United Nations further explained that the prejudice of local residents towards migrants and immigrants is one of the main factors that drives bullying (Pells et al., 2016). Although the hukou policy is specific to China, the overall global migration trend is not limited to one region or country (Vervoort et al., 2010). In other words, as the migration trend continues to exist globally, differences in culture, languages, and ethnicities among migrants could also increase bias- or prejudice-based school bullying worldwide. Therefore, a long-term anti-bullying mechanism is needed to build an inclusive school environment with safety and promote students' healthy and happy growth with diverse backgrounds.

The Role of School Migrant Composition

The second research question focused on the role of school migrant composition in the well-being gap between migrant and local students in China, specifically focusing on student mental health, sense of belonging to schools, and bullying victimization experience.

The second research question asked: what is the association between the migrant composition of a school and migrant students' well-being? While the literature on immigrant students has investigated the racial/ethnic composition of a school and how that influences immigrant students' school experience (Barth et al., 2013; Edwards, 2016), research that addressed the question on whether the migrant composition of a school influences students' well-being within the specific context of China is limited. As the Chinese government continues to address the issue of educating migrant students in large urban cities, it bears great significance to study the role of migrant composition, as a school-level factor, in students' well-being. According to the person-environment fit theory, this study hypothesized that students would feel more comfortable when being in an environment with more peers with similar backgrounds, and thus show better well-being on their self-reported measures. Contrary to this hypothesis, the results showed that when the proportion of migrant students increased in public schools, migrant students' self-reported mental health decreased; however, migrant students' self-reported belonging to schools increased. In terms of bullying victimization experience, the relationship between migrant status and bullying victimization experience does not vary by the proportion of migrant students in schools.

First, regarding the role of school migrant composition in students' mental health, the results showed that the school proportion of migrant students is negatively and significantly related to the measure of student mental health. Students who are migrants are found to have additional decrease in the measure of mental health when the proportion of migrant students increased in schools. While international literature focused on school racial composition has found that percentage of minority student in school is positively related to

minority students' psychological well-being in some countries (Benner & Crosnoe, 2011; Müller et al., 2020), findings from this study suggested that this is not consistent for migrant students' mental health in large urban cities in China. One possible explanation is that, as some scholars have pointed out, people who stay or share a common environment, such as studying or working, tend to share their psychological feelings (Fowler & Christakis, 2008; Rosenquist et al., 2011). In other words, mental feelings are transmittable among people who interact with each other within the same environment. Within schools, scholars have found that as school principals and teachers share a common working environment, they tend to be similar on stress level and the measures of principals' and teachers' stress tend to be correlated to each other (Westman & Etzion, 1999; Jerrim & Sims, 2022). As teachers and students shared the same school environment, teachers' well-being is found related to students' engagement in schools (Oberle et al., 2020). Similar findings have also been found between students within schools. Specifically, students' mental health issues, such as level of anxiety, are found to have peer effects—the average depressive or anxious level of a class or schools is found positively related to individual student's depressive or anxious level (Müller et al., 2021; Prinstein, 2007). Acknowledging the fact that migration is a stressful process and that migrant students were found to be significantly lower on the measures of mental health compared to their local peers, it is possible that migrant students' anxiety or stress related to their adjustment transmits to their peers during school interaction. As migrant and local students share the common school environment, when the proportion of migrant students increases, it is possible that the measure of mental health decreases for all students.

While migrant people are often being described as less-educated and with low-socioeconomic status, schools with a high concentration of migrant students are often being labeled as low-quality or under-resourced by urban residents (Y. Chen & Feng, 2013; Smith & Joshi, 2016). Local parents are more willing to enroll their children in schools with fewer migrant students (P. Liu, 2021; Y. Zhang, 2017), and teachers prefer schools with fewer migrant students (Liu, 2020). As a result, migrant students may internalize these negative perceptions from parents, teachers, and society to themselves, which can be harmful to their mental health. In other words, while migrant students have already experienced social exclusions in society, enrolling in a school that also suffers from negative perceptions will double mental health risks rather than promote mental health. As mentioned by Lin and colleagues (2019), “the environment, including family, school, and society at large, continually reminds migrant children about the different life trajectories laid ahead of them.” In fact, migrant students who enrolled in migrant-only schools are found to have lower satisfaction with their situation compared to those who enrolled in public schools, as they believe the large number of migrant peers in migrant-specific schools has limited their interaction with local people, resulting in more fear towards adjusting to urban life (Yuan et al., 2009). Some migrant students from migrant-only schools even reported that they had experienced identity crisis as their schools, families, and themselves are subject to social reproach—the negative perception of migrant people overall is long-lasting even after they have settled down in the host city for years (Yuan et al., 2009).

It is important to acknowledge that the measure of student mental health reflects the overall mental health of a student. Specifically, the survey questions in PISA 2018 that

were used for students to answer about their mental health status did not emphasize the school environment or whether the mental health issues are directly related to school experience. Instead, these questions asked about students' general feelings, such as joyfulness or cheerfulness. In this case, it is possible that migrant students reported their mental health according to their overall feelings in the host city, including but not limited to their psychological feelings related to adaption, adjustment, as well as the challenges and barriers they have encountered during their migration process. When the proportion of migrant students increased within a school, more students would report lower mental health which, in turn, spread to their peers through interaction within the school environment. Therefore, it becomes important for school leaders in China to think about how to better offer migrant children necessary services related to a range of issues affecting them at school and in society, heading off long-term psychological and social problems. It is also necessary for policymakers in China to consider how to eliminate the negative perceptions of migrant students from local students and parents.

Second, regarding the role of school migrant composition in students' school sense of belonging, the results showed that the school proportion of migrant students is positively and significantly related to the measure of student sense of belonging to schools, and there is an increase specifically for migrant students when the proportion of migrant students increased in schools. Acknowledging that there is a gap between migrant and local students in school sense of belonging where migrant students are found to have a lower sense of belonging to schools compared to their urban peers, this finding suggests that having more similar peers in schools can help migrant students feel more included to their school environment. International research focusing on a school's racial composition and students'

sense of belonging to schools has demonstrated that meaningful interactions with peers can increase students' belonging to schools. Students who have seen more similar peers—specifically, peers who share similar racial/ethnic backgrounds—are found to have higher sense of belonging in schools as they develop friendships and connections and receive peer support from their friends (Ashwin et al., 2022). The results from this study support the current educational policy in China that public schools should keep its door open to migrant students in large urban cities.

School sense of belonging has been identified as an influential factor in the resettlement of children with migration or immigration backgrounds (Cartmell & Bond, 2015). Previous research has emphasized the importance of forming positive connections and relationships with school peers for students with immigrant backgrounds (Ordaz & Mosqueda, 2021) and suggested that schools are places where the quality of relationships and social connections with peers have consequential effects on immigrant students on both their academic outcomes and well-being (Gibson & Carrasco, 2009; Suárez-Orozco et al., 2008). In other words, the emphasis on school peer composition argues that if ethnic minority students feel close to their peers in school, this relationship may serve as a psychological bond to their schools. Having a positive relationship with peers can foster students' opportunities to gain access to school resources that may contribute to an increase in their school belongings (Gowing, 2019). Moreover, student themselves, when being connected, can provide a source of social capital for each other, and strengthen their experiences of belonging (Gibson et al., 2004). Although migrant students in China may migrate from various places within the country that have different dialects, customs, and cultures, international literature focused on immigrant students suggest that having a shared

background of migrating can help to build connections and relationship among peers, which, in turn, contribute to student's emotional and mental well-being. Therefore, it is essential that public schools in China create an environment where migrant students feel connected and integrated into the school, at both school- and policy-level.

More importantly, it is worth noting that while this study found a positive relationship between school proportion of migrant students and migrant students' sense of belonging, it does not argue for segregating migrants and local students into different schools. Rather, this study argues that ignoring the association between school context—specifically migrant composition—and student well-being can have negative consequences for migrant students in China. In fact, results from this study argue against simply increasing the number of migrant students in public schools—when combining the results from students' mental health and sense of belonging, it showed that there is a trade-off between these two measures. In other words, efforts to promote migrant students' sense of belonging by simply increasing the proportion of migrant students in schools may introduce challenges for students regarding their mental health. Therefore, identifying the specific school migrant composition required for students to develop positive well-being would be helpful in developing educational policies related to migrant students that consider well-being with educational outcomes. Currently, as some scholars have pointed out in China, the enrollment rate of migrant students in China varies greatly depending on how local government and school districts implement policies related to migrant students (Ren & Yang, 2011; Li, 2020). While some schools have used screening strategies to screen migrant students (D. Li, 2020), other schools are enrolling a relatively large percentage of migrant students (Z. Liang et al., 2020). Moreover, school resources, such as teacher

quality and after-class activities, are not equally distributed among public schools (Liu et al., 2020), and migrant students are more likely to enroll in schools that are under resourced. In this case, balancing resources, providing opportunities across schools towards better equality, and deterring unequal treatment within schools are important considerations for caring about student well-being and narrowing the well-being gap between migrant and local students. Efforts to build a more equitable environment for migrant students must simultaneously evaluate and address individual and institutional barriers that migrant students face in society. There is a need to consider policies that address inequities both across and within schools.

In addition, while some research focused on school racial composition has found a linear relationship between school racial composition and student outcomes (Benner & Crosnoe, 2015; Geven et al., 2016), others mentioned that there might be a nonlinear relationship between racial diversity and student outcomes such as friendship and well-being (Moody, 2001; Thijs & Verkuyten, 2014); future research is needed to explore the link between student well-being and school migrant proportion using more complex forms or higher-order forms such as quadratic terms.

Regarding the role of school migrant composition in students' bullying victimization, this study found that migrant students' bullying victimization experiences do not vary by the percentage of migrant students within a public school. This finding aligns with some international studies focusing on the relationship between the racial/ethnic composition of a school and student bullying experience. Specifically, researchers have found no significant relationship between the ethnic composition of a school or a class and student victimization (Graham & Juvonen, 2002; Hanish & Guerra, 2000; Verkuyten & Thijs, 2002;). Vervoort

and colleagues (2010), based on student data from the Netherlands, also found that the ethnic composition of school and class did not moderate the relationship between ethnicity and victimization. In China, where there will be increasing numbers of migrant students moving to large urban cities, this study suggests that having migrant and local students together does not automatically lead to migrant students' experiencing more bullying victimization. However, it is important to point out that while bullying experience includes many aspects, such as bullying perpetration, bullying victimization, and bullying bystander, this study only focused on students' bullying victimization experience. Future research is encouraged to explore more on other types of bullying experiences related to migrant students enrolled in public schools.

Lastly, it is necessary to mention that, although the coefficient is small in this study, the results did not suggest that the influence of migrant status on student well-being can be neglected. As mentioned by Kraft (2019), in the field of social science, studies are more likely to find larger effects on outcomes that are easier to change, while outcomes that are the culmination of years may have smaller effects. In this case, as student well-being is more of a psychological feeling built upon years of experience, it is not surprising to see that this study only found a small effect on the relationship between migrant status and the outcome. Kraft (2019) also mentioned that, in social science studies, a 0.2 effect size, though being interpreted as small based on Cohen's standard, is a medium effect size. Considering the long-term influence that well-being can have on students' life-long satisfaction, enjoyment, and even suicidal thoughts (Boden et al., 2016), this study argues that more attention should be given to migrant students' well-being rather than interpreting this issue as negligible.

Limitation and Future Research

There are several limitations I consider significant in this dissertation. First of all, PISA 2018 is a cross-sectional data, meaning that PISA data can only capture migrant students' well-being at a certain time point. Therefore, the results from this dissertation cannot be interpreted as cause and effect. Although necessary school- and student-level variables are incorporated in the analysis, findings from this study only suggest that there is a correlation between students' migrant status and their well-being outcomes. Future research needs to collect longitudinal data that includes more information on migrant students so that we can examine migrant students' well-being in a more accurate way. Also, the China dataset of PISA 2018 can only be generalized to 15-year-old student population in four provinces—Beijing, Shanghai, Jiangsu, and Zhejiang—in China (OECD, 2019). Specifically, Strauss (2019) has pointed out that even though China has more than 20 provinces, only four economically developed provinces participated in the PISA survey. These four provinces are also vastly different in its province level—while Beijing and Shanghai are considered as mega cities in China, Jiangsu and Zhejiang are provinces that include multiple cities. However, it is due to the high development of these four provinces in economics that makes these places a destination for migration in China. In other words, the issue of migrant education in China is most prominent in these four provinces, making the China data in PISA suitable for this study. Therefore, the results cannot be generalized to the entire country.

The second limitation relates to the variables included in the dataset. Although PISA data has already included a wide range of variables related to student demographic and school contextual variables, other factors that may be related to migrant students' well-

being are not included. For instance, migrant students are also subjected to the impact of community and society. The attitudes of local residents and their interaction with local people may also largely influence migrant students' mental health. Meanwhile, as PISA 2018 administrated parental questionnaires to collect information on parents' involvement and expectation on their children's education, China did not choose to participate in the survey. Acknowledging the importance of family environment on student learning experience, such as parents' emotional support and expectation on students, future research should make an effort to include these variables that capture influences from parents, families, and communities that related to migrant students' learning experience and well-being. Moreover, as the three outcome variables, mental health, sense of belonging to schools, and bullying experience, cannot capture all aspects of student well-being in schools, future research is encouraged to collect other measures to provide a more holistic view on migrant students' well-being. Scholars have also mentioned that measures related to well-being are closely related to the culture in the country, and students from countries in East Asia may not understand the construct of well-being the same as students from northern European countries (Rappleye et al., 2019). In this case, this study does not intend to compare measures in well-being across countries but is conducted with the hope of using the result from China to inform other migrant-receiving cities to improve students' school experience and facilitate policymaking.

Third, the independent variable in this study, student migration status, is constructed as binary and cannot perfectly capture the path of a student's migration. Although PISA 2018 provided information regarding students' residency, specifically, whether the student is a resident in the test-taking province, it does not provide any information on where the

student migrates from. In other words, a student who migrated from a nearby urban city to Shanghai will be coded the same as a student who moved from a rural village to Shanghai—both of them are coded as a migrant in this study. However, in China, these two students may meet completely different school barriers, including but not limited to dialect, cultures, and values, thereby may have different experiences in school and have different relationships with peers (Zhao et al., 2017). These two students may also have very different socioeconomic status, considering the economic disparity between rural and urban areas in China. Due to the data limitation, this study cannot catch the nuances behind students' migration status; future research is encouraged to distinguish students' migration paths when examining migrant students' school life experiences. Moreover, as Yuan and colleagues (2013) mentioned, the student's migration process is also an adaptation process. In other words, when migrant students familiarize themselves with the host city's dialect, culture, and values, they will become assimilated to their urban peers, encounter less rejection and discrimination, and have more positive well-being and mental health (Yuan et al., 2016). Therefore, future research needs to collect longitudinal data regarding migrant students to understand whether the length of migration influence students' school life experience.

A fourth concern is that PISA 2018 is not a China-specific data, so that some information relevant to the Chinese context is not included in the dataset. Although PISA 2018 collected rich information regarding students and schools, it was not collected in an effort to measure the educational situation of migrant students. As a result, certain information pertaining only to the issue of migrant students' education is not included in the dataset. For instance, the dataset does not include whether migrants have extended

family members in the host city and whether students are first- or second-generation migrants. Although this information can hardly change a student's migration status as an individual's hukou is heredity in nature, it can be relevant to the student's familiarity with the host city and may influence the student's schooling experience. Therefore, future research needs to include variables that are more relevant to China and more specific to migrant students in order to generate better research-based implications.

Lastly, it is important to acknowledge that China is a vast country with a large population—in addition to the ethnic majority (Han people), there are currently 55 officially-designated ethnic minority groups (Li & Zhao, 2017). Ethnic minority people often use different languages—both spoken and written, and have different cultures, religions, and food preferences (Gustafsson & Yang, 2015). While research has mentioned that ethnic minority people are mostly live in “ethnic autonomic regions” that receive preferential policies from the central government in education and labor market (Yang & Wu, 2009), the differences between ethnic minority and majority in terms of language and culture could still potentially influence people's choice in migration (Gustafsson & Yang, 2015). While some ethnic minority groups, especially those who live in autonomous regions, were found less likely to migrate to other provinces, some ethnic minority groups, such as Hui, were found to migrate to other provinces similarly to the ethnic majority group (Gustafsson & Yang, 2015). However, PISA data does not incorporate a measure of students' ethnic groups in its survey. Future research is encouraged to explore how different ethnic groups influence the migration flows and whether migrant students from different ethnic groups are experiencing different integrating policies in the public school system.

Conclusion

In conclusion, this dissertation explored the well-being gap between migrant and local students in public schools in Beijing, Shanghai, Jiangsu, and Zhejiang in China, using the most recent PISA data from 2018. This study also investigated the role of school migrant composition in students' well-being gap. Results of this study suggested a well-being gap between migrant students and their local peers in terms of student mental health, sense of belonging to schools, and bullying victimization. Findings imply that, to better serve migrant students in large urban cities in China and to create an inclusive, equitable learning environment for all students, it is important to acknowledge this well-being gap and provide necessary school services for migrant students. This study also raised awareness of how migrant composition of a school is associated with migrant students' well-being. Understanding the role of school migrant composition in student well-being can contribute to the current policy of *integrating* migrant students into public schools. Future research is needed to provide a more comprehensive picture of student well-being in China and provide more empirical evidence of *what* can be done to promote students' well-being in China.

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