

ASSIMILATION PATTERNS OF MIGRANT STUDENTS IN CHINA: AN EXPLORATION OF THEIR IMPLICATIONS FOR MATHEMATICS OUTCOMES



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ABSTRACT

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This study is concerned to compare and contrast academic performance indicators which characterize migrant students in segregated schools, as opposed to integrated schools, and investigates the differences in their levels of mathematics achievement in terms of length of residency and specific grade level. Extrapolations derived from performance results in mathematics display a pattern of what we call 'segmented processes of assimilation', conditioned distinctly in accord with the length of residency migrant children spend in urban areas in the Chinese context. The implications of these disparities and inequities are discussed, with an aim to encourage policy makers to recognize that reform of the segregation patterns for Chinese migrant students is clearly imperative.

Contribution/ Originality: This study contributes in the existing literature of assimilation patterns of migrant students in segregated schools, as opposed to integrated schools. This study is one of very few studies which have explored the implications of assimilation patterns for mathematics outcomes in a Chinese context.

1. INTRODUCTION

The 'National New-type Urbanization Plan (2014-2020)' promulgated by the Chinese government has ambitiously accelerated the urbanization process and targeted 60 percent of Chinese people living in cities by 2020. The consequent issue of rural-urban migrant children's education takes on a role of national importance that we believe will no doubt figure prominently in either improving or diminishing the educational outcomes for Chinese migrant students' chances of academic success. We identify this equity problem as 'the process of diminishing academic returns'. Previous studies have revealed that there exist diverse processes and disparate outcomes of assimilation for migrant students, depending upon whether these processes lead some groups to integrate successfully into mainstream urban schooling, or whether others become sequestered in segregated migrant schools of minimal resources and teaching skills (Portes and Zhou, 1993; Zhou, 1997).

In recent years Chinese policy has been inclined to allocate placement for migrant children of higher socioeconomic status into urban public schools of advantage, while migrant students of lower socioeconomic status tend to be segregated in migrant schools of disadvantage (Wang, 2012; Chen and Feng, 2013). This being so, our present paper will be concerned to explore the consequences of inequitable public school placements. We endeavor to show that the resultant performance outcomes in mathematics are sufficiently similar to those predicted by studies on segmented enrolment assimilation in many countries that the inequities of outcome for Chinese migrant students become of significant pedagogic interest. With a view to improving academic achievement for all migrant children in China, both in segregated migrant schools and in integrated public schools, this study will seek to provide an analysis of a wide array of empirical findings which characterize the inequitable and disparate learning experiences of migrant students in situations of school segregation and desegregation. To keep the paper within manageable investigative bounds, we have delimited the study to isolating inequities related specifically to the academic performance of Chinese migrant students in terms of mathematics achievement.

In the following section, our review will focus on studies related to the education of migrant children in urban areas, focusing attention on the few Chinese studies that have examined the inequities which have arisen from the segregated and desegregated provision of primary education, particularly in relation to migrant children's achievement in mathematics. Given these educational disparities, our objective will be to tease out the effect of school segregation on migrant children's mathematics achievement, as it relates distinctly to two issues: (1) the 'length of residence' which students spend in urban areas, and (2) learning impacts conditioned by the specific grade level in which students are enrolled.

1.1. School Segregation and Educational Outcomes

Considerable evidence has now accumulated worldwide to establish that segregation is an important factor in explaining certain differences in educational outcomes amongst migrant individuals (Dunne and Gazeley, 2008; Sikink and Emerson, 2008; Agirdag *et al.*, 2013). We submit, however, that there is a radical ambiguity in the interpretations given in the literature to the term, 'segregation' which has served to conflate conceptual subtleties of importance which need to be rendered far more pellucid. Ever since Coleman *et al.* (1966) published his research on the impact of ethnic and socioeconomic school composition on students' academic achievement, the effect of segregation on migrant students' academic achievement and the ambiguities surrounding the concept of 'segregated schooling' remain insufficiently articulated, and have caused confusion. The equity problem of diminishing academic returns to which we are alluding cannot be reduced irrevocably, and without ambiguity, to the distinction between 'segregated' and 'non-segregated' schools. Although a general consensus has nevertheless emerged to suggest temptingly that the problem of inequity can be resolved simply by restructuring the system of educational provision such that the gap between segregated and non-segregated migrant education is maximally diminished, we submit that this is a temptation to be resisted. While it is no part of our purpose to deny that there are significant differences in 'performance outcomes' between students attending segregated and non-segregated schools, the fundamental problem of inequity cannot, on our view, be reduced to the oversimplified disjunction which simply contrasts the advantages of segregated and non-segregated schools. It is salutary to remind ourselves that the problem of educational inequity cannot be reduced simply to the issue of 'segregated schooling', because the problem is not so much about whether an educational institution is or is not segregated, as it is whether the institution in which a student is enrolled, segregated or not, can provide 'quality education'. It is incontestable that 'private schools' are in essence, an institutional form of 'segregation', but a considerable literature has accumulated to show that the academic performance of private school pupils is generally superior to students attending public schools. Similarly, there are a number of progressive, but technically 'segregated schools' which focus on pupils from lower socioeconomic backgrounds, whose performance levels are outstanding. So, the problem of disparate academic performance levels does not admit of straightforward reduction to segregated schools as the causally-

defining characteristic of likelihood of academic success. The analysis of these issues needs to be much more precise with regard to the peripheral variables which give sense and substance to the concept of a 'segregated school'. We submit that the concept of school segregation is not monolithic in interpretation, but rather, multifaceted, and we believe this is an insight of paramount importance in advancing our understanding of inequities in Chinese migrant education in particular. The deeper problem is that those students, from minority groups or not, who are enrolled in segregated schools where poor students are concentrated, perform academically less well than those children who are enrolled in schools, segregated or not, where students from wealthier families are concentrated (Davis-Kean, 2005).

It is manifestly clear that migrant pupils who attend schools with a greater share of children from higher socioeconomic backgrounds, segregated or not, have been found to perform better academically (Guo, 2011; Lai *et al.*, 2014). In contrast, minority students in segregated schools of lower socioeconomic status, tend to produce students who have lower levels of educational attainment, fewer job opportunities, a reluctance to pursue demographically integrated relationships later in life, and an increased likelihood of holding parochial and prejudiced attitudes (Linn and Welner, 2007). Indeed, several studies on the mental health state of migrant children from segregated schools located in lower socioeconomic backgrounds have revealed that Chinese migrant children in these circumstances are likely to suffer slight psychological health problems and develop poor learning habits (Tao *et al.*, 2004; Xie, 2007). In contrast, the adaptive capacity of migrant children in public schools is better than that of migrant children in segregated migrant schools, regardless of the student's grade level (Shen, 2008; Li *et al.*, 2009).

Other studies have focused on migrant children's mathematics achievement and indicated that migrant children in public schools perform better in academic achievement than migrant students in segregated migrant schools (Lu, 2007; Chen and Feng, 2013; Lai *et al.*, 2014). The point to bear in mind, however, is that the equity differences that emerge here cannot be reduced merely to whether a particular school is segregated or not. The real question is whether a school, segregated or not, can provide a quality education by way of the academic and methodological excellence of its teaching staff, and their capacity to inspire students to learn, and in so doing, help them find the things they love learning. In essence, the success of a school depends on the quality of the resources it can provide, not only in human and physical resource terms, but in its capacity to engender spiritual resources, as in promulgating the values and purpose of education. Some of these things require money, but it would be misguided to conclude that the academic success of a school can be reduced simply to the money it has to provide these things.

1.2. Segmented Assimilation and School Segregation for Chinese Migrant Children

Given the quite considerable array of demographic differences amongst countries, it is understandable that the degree of school segregation and socio-cultural assimilation is likely to differ. It is a salutary reminder to note, however, that current social phenomenon of massive 'internal migration' distinguishes China from many, if not all other countries. The rapid escalation in China of economic development in recent decades has caused a large number of peasants to seek better education and employment opportunity in urban areas. Because of the deliberate structural orientation of government policy, however, these migrant children are often segregated from urban mainstream culture and schools (Wang, 2008; Wei and Hou, 2010).

One relevant US stream of literature focuses on the impact of school segregation of immigrant and minority children in the United States that has adverse consequences for various aspects of child development (Rumberger and Palardy, 2005). The theory of 'segmented assimilation' which posits diverse processes and outcomes of assimilation of the second generation lead some groups to integrate to the mainstream while others languish in poverty (Portes and Zhou, 1993). From a broader comparative perspective, internal migration in China is unique due to the institutionalized internal division of the Chinese population enforced by the 'Household registration system'. On the other hand, Chinese internal migration shares significant structural elements with migrant

experiences in other societies, where these elements often intersect with race, ethnicity, and citizenship status. In this respect, the extensive literature on children of immigrants in western countries, especially the United States, can inform studies of migrant children in China. One major framework developed to understand the educational well-being of immigrant children is the segmented assimilation perspective (Portes and Zhou, 1993). Rather than expecting uniform experiences of adaptation, this perspective predicts divergent outcomes for immigrant children, depending on the human capital, social capital, and other resources of their immigrant parents and communities. Some children would achieve upward assimilation as a result of their parents' high socioeconomic status and favorable context of reception, eventually integrating into the White middle-class mainstream. In contrast, children whose immigrant parents lack resources, and who are exposed to inner-city neighborhoods, would experience downward assimilation to the so-called 'underclass', stagnant at the bottom of society. A third group may combine upward mobility with traditional cultural values. Such selective acculturation often turns out to be an advantage.

Much of the empirical study undertaken in the United States, nevertheless, finds little evidence of downward assimilation, even for children of low-income immigrant parents (Foner and Alba, 2008). While all three types of assimilation occur, downward assimilation is the least likely. The majority of immigrant children faring better in socioeconomic terms than their parents' generation, often reach parity with or exceed their native-born peers. After adjusting for a wide range of background characteristics, this pattern reveals that most of the contemporary second generation would be likely to experience a gradually increasing measure of social integration (Alba and Nee, 2009). These segmented patterns of assimilation are also attributed to legal, social, and economic policies that grant to the children of immigrants a range of special protections, opportunities, and even benefits (Farley and Alba, 2002). Although on average immigrant families tend to be worse off socioeconomically than native families (50 percent vs. 33 percent below twice the poverty level) (Capps *et al.*, 2003) US civil rights legislation and affirmative action programs have largely afforded immigrant children opportunities for advancement in mainstream institutions, and have protected them from downward mobility. With respect to education in the US, immigrant students are, by law, entitled to free public education from kindergarten through grade twelve, even if they are undocumented children. Although the opportunities described above also apply to children of undocumented immigrants, they tend to have poorer outcomes than do children of legal immigrants (Rumbaut and Portes, 2001). In comparison, native minority children tend to have the poorest outcomes.

It is clear that a complex range of factors affect the well-being of immigrant and minority children within these groups. One set of factors concerns school context, including both the structural (e.g., curriculum, composition) and social resources (e.g., collective responsibility, peer and student-teacher relationships) of schools (Hao and Pong, 2008). Some groups of immigrant children and a large fraction of minority children live in inner-city neighborhoods with poor and segregated schools (Rumberger and Palardy, 2005). An extensive literature connects this kind of school segregation in the United States to inequality in educational attainment, suggesting that students in these schools tend to perform less well than other children, and are more likely to drop out of school and engage in risky behaviors (Wells and Crain, 1994).

We have been arguing that the real problem of educational inequity is not segregated schools in themselves, but rather schools which are strongly defined by socioeconomic segregation. The problem is that minority schools in China are not only segregated, but predominantly struggling with poverty and limited resources. Segregated schools, for example, are much more likely to have overcrowded classrooms, employ less qualified teachers, and provide less nurturing atmospheres (Darling-Hammond, 2007). Independent of the socioeconomic environment, racial and ethnic composition within schools also has important impacts on students' outcomes. Ethnic minority children, attending mainstream educational institutions (that is, desegregated schools with a large proportion of 'white students') exhibit higher achievement levels, higher self-worth, and better social competence (Postmes and Branscombe, 2002). Students in desegregated settings also report fewer incidents of racial discrimination. These

results have prompted strong avocation in the US for the integration of minority and into the school setting (Hausmann *et al.*, 2009) something we are arguing should be, but is not happening in China.

It is worth noting that school segregation in the United States, as it currently impacts on immigrant children is much less evident than it has been between whites and non-white children, or between poor and middle-income students. The theoretical perspectives discussed above are relevant to understanding Chinese migrant children, but they need to be adapted to suit the Chinese setting in which migrants face a different institutional context. Segmented assimilation theory stresses the interaction between assimilation and social contexts, especially family and community resources, but does not explicitly outline the role of school segregation in assimilation outcomes. This omission may exist partly because in the United States school segregation mostly intersects with race as opposed to immigration status. In China, however, school segregation can operate as a crucial mechanism for the process of assimilation of migrant children, given the substantial structural barriers these children face. While some migrant children are able to enter mainstream education institutions (public schools), many have endured significant segregation in informal migrant schools.

In the present study, we are endeavoring to integrate segmented assimilation theory into a strategic heuristic to predict the outcomes of different groups of migrant children. Extrapolating from the relatively consistent findings of the adverse impact of school segregation on children in the United States, we are postulating that Chinese migrant children in public schools are likely to benefit from attending desegregated educational institutions. Such schools offer superior connections to the mainstream, better educational resources, and possibly a lower level of discrimination, all of which are characteristics that can launch migrant children on a path towards assimilation. In contrast, the present form of segregation of migrant children tends to increase their contact with academically unfavorable elements of disadvantaged migrant populations, subsequently slowing or in some cases, even halting the assimilation process.

1.3. Implications of the Length of Student Residency in Urban Areas and Specific Student Grade Levels

Segregation characterized by variables such as the length of student residency in urban schools, along with their specific grade levels, have been identified as important factors in helping to explain mathematics performance discrepancies among students in urban public schools and segregated migrant schools. The more protracted a student's stay in an urban public school, the more beneficial the performance outcomes in mathematics, while the specific grade level in which a student is situated during his/her time of residency can also impact positively on mathematics performance. Migrant children from educationally disadvantaged places of origin benefit significantly from exposure to 'richer' schooling environments and the longer their length of stay in such environments, the greater the level of improvement in their academic performance. Given increased exposure to this better-resourced academic environment (Lai *et al.*, 2014) that is to say, students tend to perform better than they would in segregated schools of lower socioeconomic background. One reason given why the duration of residency in urban public schools matters for migrant children is due to the fact that the potential for migrant student self-transformation and higher achievement outcomes comes through the opportunity to experience the phenomenon of 'acculturation' into mainstream society and the value it places on educational success, along with the provision of resources which facilitate this outcome. In short, improved outcomes in migrant student academic performance in mathematics, and generally improved academic achievement for them across the curriculum, are positively affected by protracting the period of their stay in academic environments which assure their exposure to the 'richer' experience of acculturation, both academic and social, afforded by educational institutions of higher quality. As we proposed earlier, this difference of quality is generally manifested by schools which possess better trained and more highly committed and inspiring staff, who are working in a school which has sufficient resources to serve the goal of achieving academic excellence.

We have now established that migrant children from educationally disadvantaged places of origin are particularly likely to benefit from the increased time in the richer learning environments of public schools. Conversely, migrant children in poorly resourced private migrant schools may experience a widening achievement gap in relation to their public school counterparts, as their length of residence in urban areas of schooling also increases (Chen and Feng, 2013). Meanwhile, the length of residence needs also to be discussed in terms of the migrant child's particular grade level. Many studies have described a significant and widening school behavior gap for migrant children only in anecdotal ways or have only focused on mathematics achievement at one grade level (Lai *et al.*, 2014). As they progress in urban schools, the psychological wellbeing of migrant students in primary and middle schools, particularly in higher grade levels, suffer an increased sensibility of discrimination (Tao *et al.*, 2004). Attitudinal surveys of children in middle schools have revealed that they feel less aspiring towards education, in comparison to students in primary schools (Li *et al.*, 2009). It is, however, equally important to acknowledge that very few studies have been done which empirically examine the patterns of migrant students' academic achievement across grade levels. As a result, little is actually known about migrant children's mathematics achievement in different grade levels in primary schools.

In summary, the literature indicates that there is evidence to show that a mathematics achievement gap exists between migrant students in private migrant schools and public schools. Our aim has been to show that there exist subtle variables which render this general statement a philosophically naive oversimplification. One of the most poignant of these relates to the way in which different equity problems arise in the racially isolated contexts of many migrant schools in China. We have also argued that in such situations egregious equity issues arise when the measurement of educational success is exclusively based on 'test score-related' dimensions of examination. We submit that more government support is needed to promote research on the nuances of adverse impact which threatens the overall wellbeing of migrant students sequestered in segregated schools. The question of paramount importance is how we define the purpose of schools and then monitor equal opportunities to ensure that migrant student's access to quality education serves to maximize their true potential. It is critical that inequities which result from segregated and integrated schools are accurately reflected to better understand how best to foster social integration and equality within Chinese education. We have argued that the variables which condition mathematics performance of migrant children remain largely unknown, and this is a gap which we have tried to close here. This study has narrowed this gap by advancing research based understanding of the respective roles played in achieving academic success by school types, length of residence in schools of these types, and the implications of grade level placement. In response to this aim, two research questions have been framed to guide the study.

1.4. Research Questions

1. To what extent do the mathematics achievement levels of migrant students vary, depending on the grade level in which they are enrolled?
2. Does a relationship exist between the length of migrant student residency in urban area schools and higher levels of achievement related to their performance in mathematics?

2. METHOD

In this paper, we shall focus on two types of schools in which migrant children have been placed in urban areas. These include: private migrant children's schools (migrant schools) and public integrated schools (public schools). This study was conducted in four primary schools in Shanghai in 2013. All participant students are children enrolled in years 2 to 5. In order to control for educational differences between central and peripheral districts in Shanghai, all of the participant schools were selected within one of the suburban districts. The same mathematics test was conducted within the primary schools as the final examination of the semester. Students' scores were collected and evaluated by the local Ministry of Education.

The mathematics test scores of all participants were provided by participating schools. In this study, the mathematics test set is in accord with Shanghai curriculum standards and has been designed to satisfy the requirements as stipulated by the State Education Commission for each corresponding grade level. The tests varied by grade level to accommodate different curriculum requirements for each semester. The exam consists of three sections: the first being devoted to number and computing (20%); the second to concepts comprehension (40%); and the third to problem-solving (40%). Each grade level employs the mathematics test separately. The math test score scale is 0-100 points. To assess students' mastery of mathematics across grade levels, scores of 60 points or above is the level required to pass the exam. Below 60 points signifies failing in the exam, and 80 points or above represents an excellent result.

In addition, the participating schools also provided the demographic information associated with all students participating in the testing, including the student's length of residency in urban areas, along with their specific grade levels. In China, the educational system at primary school level includes year 1 to year 6. However, the primary education of migrant children in this study refers only to pupils in grade levels, from year 2 to year 5. For participant schools, year 1 migrant students are not allowed to be tested, according to the regulations of the local educational authority. Interestingly, year 6 migrant students are required to participate only in the school admissions test that is designed and set respectively, and separately, by each individual school. All of the participant urban children in the study refer to local children who were born and have lived in urban areas. This being so, the issue of the duration of urban residency was discussed only with reference to migrant children. In this regard, the length of residency in urban areas was categorized into four types: 2 years or below, 2-5 years, 5-8 years and 8 years or above. It was evident that the majority of migrant children tend to migrate to urban schools at the point of kindergarten entry (3 years for preschool education) or year 1 for compulsory education in urban primary schools. Correspondingly, the migrant length of residency in urban areas for year 2 students is supposed to be either 2 years (at year 1 entry) or 5 years old (at kindergarten entry). Subsequently, migrant students in years 3-5 will also be regimented by the same categorical quantifiers.

3. RESULTS

3.1. Summaries of Demographics

In the sample of 839 migrant children, 478 migrant children (56.9%) are in migrant schools, and 361 migrant children are in public schools (43.1%). Table 1 summarizes the demographic statistics allowing for a comparison between the background variables for migrant children attending urban and migrant schools. A statistically significant difference was found between the occupational distribution of parents and school type ($\chi^2(4, N=839) = 302.66, p < .001$), and between parents' educational qualifications and school type ($\chi^2(4, N=839) = 139.45, p < .001$). The majority of migrant children's parents in migrant schools were only junior school graduates (55.6%). In contrast, public school parents had a higher percentage (23.3%) with a college degree or three-year diploma.

In each grade level, most migrant children who had migrated to urban areas enjoyed a length of residency in the city of between 2-5 years and 8 years or more (see Table 2). Year 2 migrant children in the study migrated to the urban schools between 2-5 years (35.8%) and 8 or more years (35.5%) respectively. The largest percentages of migrant children in years 3-5 have been migrated for more than 8 years (44% in year 3; 40% in year 4 and 58.7% in year 5).

3.2. Mathematics Achievement Levels

As can be observed from Chart 1, the mathematics achievement of migrant students in public schools is always higher than migrant children in migrant schools across years 2-5, regardless of students' length of residency in urban schools. For each grade level, migrant children in migrant schools migrated to urban areas for less than 2 years below, and the 2-5 years category were in a small achievement gap (less than 6 points) in comparison to

migrant children in public schools. However, the mathematics achievement gap was larger between migrant children migrated for 5-8 years and 8 years or more, across all the years. Moreover, the achievement gap was 13 points in year 2, but increased to 30 points in year 3, 40 points in year 4, and became as large as 42 points in year 5 between the two types of school placements among migrant children for 8 years or above. In other words, the gap of mathematics achievement between the two types of migrant children increased to the larger, as their migration time increased. A statistically significant difference was found between the categories of lengths of residency of migrant children and their achievements levels: $\chi^2(6, N=839) = 71.6, p < .005$.

4. DISCUSSION

This study investigates the implications for disparities in mathematics performance outcomes as arise in contexts of the segregated education of rural-urban migrant students in Chinese urban schools. The present study achieves this objective through a comparison of these different groups across several specific mathematics achievement levels. Overall, we are able to document the adverse consequence of school segregation by examining the disparities which arise for migrant children in different types of schools, within a particular domain of academic achievement. Migrant students in migrant schools and public schools revealed a significant difference in terms of parent's socioeconomic status, which in turn, confirms previous studies showing that achievement patterns of migrant students in China exhibit disparate outcomes leading some migrant children with high SES to gravitate towards public schools, while others in low SES become segregated in migrant schools (Lu and Zhou, 2013). Moreover, with regard to the length of residence and grade level, the mathematics achievement gap between students in public schools and migrant schools becomes wider as the grade level increases. However, a significant difference was also found between school types in terms of the beneficial effects resulting from the length of a migrant child's residency in an urban school area.

The concept of 'segmented assimilation' has accordingly been applied to facilitate a statistical strategy for developing a typology of vulnerability and inequity affecting differentially diminished outcomes for Chinese migrant groups. The outcome of segmented assimilation has been employed in western countries, where children of non-white immigrants may not be afforded an equal opportunity for gaining access to the benefits of middle class white society, no matter how acculturated they become (Zhou, 1997; Condron, 2009; Hausmann *et al.*, 2009). Not being able to assimilate into these sociocultural enclaves circles which deny them access has in many cases proved to be a form of cultural incarceration which condemns them to permanent subordination and disadvantage. By parity of reasoning we have similarly applied the mechanism of segmented assimilation theory in the context of Chinese internal migration to reveal the same sort of educational inequities in the Chinese situation. We have endeavored to show that there are similar problems facing migrant students in China, with regard to their diminished academic performance outcomes resulting predominantly from their inability to gain access to urban public schools with better physical and human resources than in the segregated migrant schools in which they currently find themselves. Chinese society is now diverse and segmented, with an underclass residing in urban areas comprising a large portion of rural-urban migrant families.

Our results have highlighted the negative aspects of school segregation as a mechanism of impediment for segmented assimilation in the context of Chinese internal migration. On the one hand, with increased duration of stay in cities, migrant children in public schools rapidly moved upward, achieving similar outcomes to local children, over time. Our own and other studies indicate that migrant children from educationally disadvantaged places of origin can benefit significantly from exposure to richer cultural environments. Therefore, for migrant students in integrated schools, the equal access to quality educational resources provided in urban public schools has the potential to impact beneficially even on mainstream literacy acquisition for migrant children (Markose and Hellstén, 2009). We submit that there is no reason why their improvement in academic performance should not continue, as long as their opportunity for increased exposure to quality educational resources also persists.

On the other hand, migrant children segregated in migrant schools continue to be disenfranchised, and treated as outsiders who fail to measure up to urban children, and even to migrant children attending public schools. From this it follows that migrant students in segregated schools, and who live in homes characterized by multiple types of socioeconomic disadvantage, have been found to be more vulnerable to the effects of school segregation (Wang, 2008). Similarly, migrant children in poorly resourced private migrant schools may experience a widening in the achievement gap they experience, in relation to their public school counterparts, especially as their length of residence in urban areas increases (Lai *et al.*, 2014). As a result, migrant children in poorly resourced private migrant schools may experience a widening achievement gap in relation to their public school counterparts, as their length of residence in urban areas increases.

Therefore, considerable evidence has now accumulated to confirm that there exists divergent assimilation paths for these new migrant groups in China with high SES and low SES, one of which is disposed towards upward assimilation and the other of is disposed towards downward assimilation (Lu and Zhou, 2013). During their period of segregated education from urban mainstream schools, migrant students in urban areas integrate only peripherally and cosmetically into urban society (Alba and Nee, 2009; Markose and Hellstén, 2009). This is reflected not only the achievement level hiatus which exists between the two migrant groups, but is exemplified in the ever growing gap between segregated migrant students and urban children. As we witnessed in the body of the text above, the fact that migrant students in desegregated schools achieved as favorable test results as did urban children should in itself suffice to ensure that they have the intellectual gifts and motivation to adapt effectively to urban culture. We believe that our own study has palpably indicated that given access to public school education, migrant school students should in principle be sufficiently able to improve their mathematics performance to a level of achievements which makes negligible the difference in their test outcomes from those of public school students.

Consequently, we submit that the goal of school integration, not school segregation, should become one of the most important policies of the Chinese government, if it really wants to improve the quality of education nationwide. The problem of segregated migrant students sheds light on the drawbacks of the segregation policy in the Chinese educational context (Wang, 2008; Goodburn, 2009). The resulting shortage of educational funds by local government undermines the capacity of educational authorities to accommodate all students, migrant and urban. The disadvantages experienced by migrant children, as a consequence of school segregation, may impact so comprehensively that its negative influence will be felt irrevocably on the next generation across the entire nation. In the final analysis, it is evident that despite the government's noble efforts in improving migrant students' access to public schools, and gradually fostering a new awareness of the potentially negative influence of segregated education on migrant youth, the current situation of migrant students in segregated schools still exposes them to disadvantage (Chen *et al.*, 2009; Lai *et al.*, 2014). Therefore, a continuing belief among many scholars and policy makers is that the comprehensive integration of schools is the most effective route to the equalization of educational resources across rural and urban groups. Of paramount importance also is the fact that migrant students who attend desegregated schools have access to social networks and personal friendships that are likely to have both an auspicious and beneficial socioeconomic influence on their lives in a panoply of ways.

5. CONCLUSION

This paper examines the ramifications of school segregation on migrant children's school performance by investigating the perspective of mathematics achievement in a Chinese urban setting. The results of our study indicate that the influence of segregation school policy on the migrant population has been negative engendering inequities in academic performance which could plausibly have been avoided. Our study reveals that the Chinese government's current policy of migrant segregation does not effectively deliver high quality mathematics education to migrant children in comparison to the delivery available in urban public schools. This paper suggests that the amelioration of the growing problem of inequity, with the aim of improving migrant students' academic

achievement levels, particularly in mathematics, could be brought to fruition simply by augmenting the opportunities for migrants to study in urban public schools, rather than merely implementing segregation policy to sequester them in migrant schools. Nevertheless, it is not to deny the value of migrant schools, as their role has incontestably facilitated the rapid integration of migrant children into urban schools within a short time frame. However, the deeper point made by our paper is that inequities in migrant achievement cannot be reduced as has been the dominant research predilection, to the oversimplified disjunction between disparity performance outcomes characteristic of segregated vs public school migrant education. What matters most is the quality of educational provision a school can offer, independently of whether it is segregated or not. Part of the problem in China is that not only have students of lower socioeconomic background been sequestered in migrant schools, but also have staff who are less qualified, less committed, and less inspirational. Coupled with a disparity in the distribution of educational resources amongst segregated and urban schools, the problem of inequity has been exacerbated, and thus needs to be addressed in more visionary ways.

One potential limitation of our study is that the origin of our statistical data has been restricted to Shanghai City. Although this point should be conceded, it should also not be exaggerated, as Shanghai represents one of the largest of China's migration destination cities, accommodating one of the largest populations of migrant children. While we admit that the generalizability of certain aspects of our conclusion based on our Shanghai study might seem problematic, it is salutary to remind readers that the migrant concentration and structural situation of migrant schooling in Shanghai exhibit a considerable array of similarities characteristic of China's largest cities of massive migrant populations. Of more serious concern is the fact that our sampling procedure yields a probability predictor up to the class level, but does not provide a strict probability sample of children. Finally, our study has explicitly been designed to address the equity achievement issue by reference to disparities in mathematics performance, and is thus not generalizable outside this context. This is a self-imposed limitation, and not a flaw, as the opportunity to examine other important subjects such as science provides a subject matter for future investigation.

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Table-1. Parent's background of migrant children: Summary statistics

Variables	Migrant schools	Public schools	χ^2
Occupation			302.66***
No job	3.1%	1.1%	
Factory workers	50.2%	19.1%	
Small service business	36.2%	11.4%	
State-managed company	9.6%	63.2%	
Government officials	.8%	5.3%	
Education background			139.45***
Primary school education	11.3%	7.8%	
Junior school education	55.6%	30.2%	
Senior school education	32.6%	38.8%	
Three-year diploma	.4%	20.5%	
Bachelor Degree	.0%	2.8%	

Note: *p < .05. **p < .01. ***p < .001.

Table-2. Length of residence in urban areas in years 2-5

Grade level	Length of residence	2 years below	2-5 years	5-8 years	8 years above	Total
Year 2	N	36	106	49	105	296
	%	12.20%	35.80%	16.60%	35.50%	
Year 3	N	23	49	36	85	193
	%	11.90%	25.40%	18.70%	44.00%	
Year 4	N	28	50	29	71	178
	%	15.70%	28.10%	16.30%	39.90%	
Year 5	N	22	34	15	101	172
	%	12.80%	19.80%	8.70%	58.70%	

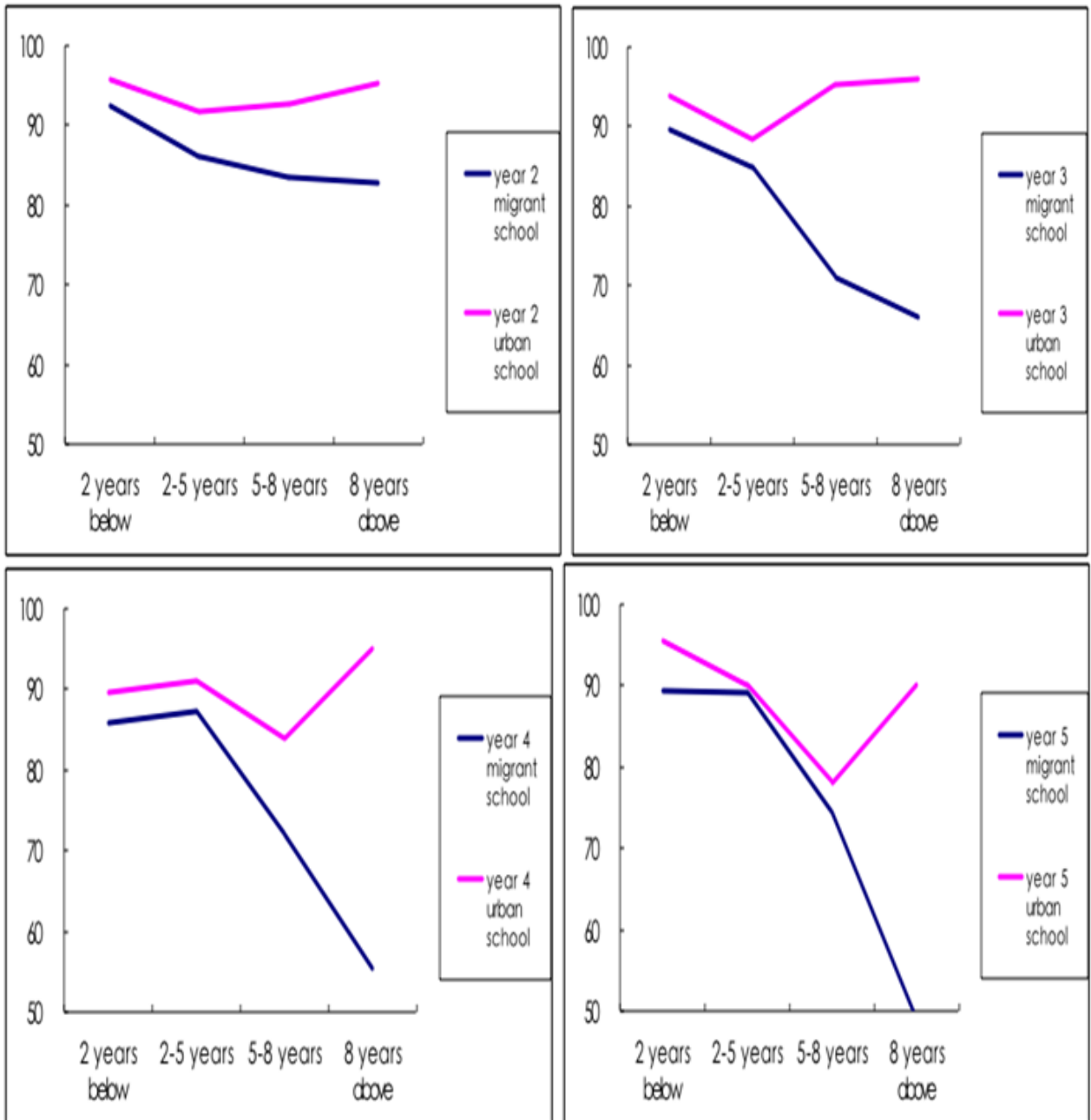


Chart-1. Mathematics test scores by length of residence in years 2-5

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