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Predictors of mathematics achievement of migrant children in Chinese urban schools: A comparative study

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ABSTRACT

In China, the education of increasing numbers of migrant children in urban settings is undertaken in integrated public or segregated migrant schools. This study compares the factors and predictors related to migrant children's mathematics achievement in public schools and migrant schools. Regression analyses were conducted to determine which independent variables (school type, sibling numbers, length of residence in urban areas, gender, preschool attendance, and parental socioeconomic status) were the predictors of migrant students' mathematics achievement. With respect to the total sample, the overall model of five factors pertinent to student achievement outcomes in mathematics was significant (sibling numbers, length of residence in urban areas, preschool attendance, parental socioeconomic status and school type). While these factors figure prominently as significant academic predictors for the migrant school sample, the only significant predictor of mathematics achievement for the public school sample is parental socioeconomic status. In the light of these findings the paper concludes with suggestions for the intervention that inform and characterize the education of migrant children in urban schools.

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1. Introduction

In many developing countries such as China, India, Indonesia and Brazil, recent economic development has led to rapid urbanization. Referred to as 'internal migration' or 'rural–urban migration', millions of rural families have migrated to urban areas seeking education and employment opportunities (Deshingkar and Grimm, 2005). Most countries have recognized that providing access to high quality educational institutions for these migrants is of paramount importance in order to sustain economic development (Chiswick and DebBurman, 2004). However, an accumulating body of scholarly literature addresses migrant students' disadvantaged learning environments in urban schools, due to traditional rural–urban disparities and institutional barriers (Feng et al., 2002). Nevertheless, most previous studies have investigated migrant students as if they were one homogeneous group. This perspective is myopic, and both simplifies and distorts the deeper issues.

In recent years the demographic backgrounds of Chinese migrant children have diversified significantly, particularly with regard to socioeconomic status. It has become clear that while some migrant students now study in urban public schools, many others remain segregated in migrant schools (Lu and Zhou, 2013). Given that a test-oriented education system is still prevalent in China, Mathematics education not only provides the opportunity for individuals to be successful in future employment, but also facilitates national economic growth (Baker et al., 2002). Therefore, the analysis of predictors in school test outcomes is critical if China is to reflect more accurately those factors hat prove to be essential in determining student mathematics success. Migrant children's mathematics outcomes are sensitively influenced by various factors occurring within individual, parents, and social contexts (Wu et al., 2010). To provide policy makers a more balanced interpretation of the current empirical studies in order to enhance migrant students' mathematics outcomes, this study will be concerned to identify the multiple predictors that are likely to influence their achievement, both in segregated migrant schools and in public schools.

1.1. Education for migrant children in Chinese urban schools

The feature of internal migration distinguishes China from many other countries. In China, because of the deliberate structural orientation of government policy, migrant children are often segregated from urban mainstream culture and schools.

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Historically there exists a dualistic class system which has socio-structurally embedded a hiatus between rural and urban areas, thereby starkly dividing Chinese people into agricultural and non-agricultural groups. As the recent process of urbanization has continued to burgeon, however, it is clear that rural–urban migrant people have presently became the largest social class, both distinct and separated from 'rural' and 'urban' people (Wei and Hou, 2010). It is estimated that China's domestic migrant population was approximately 221 million in the year 2010 (NBSC, 2011).

The system of household registration inhibits migrant people from obtaining equal resources in terms of welfare, employment, and public goods attainment, in comparison to urban residents. Correspondingly, Chinese migrant children are classified as being 'out-of-district' children seeking education in urban public schools, making it virtually impossible for them to transfer into some urban schools. Specifically, urban public schools are only allocated resources for urban children within the school district, who hold the non-agricultural registration status. This being so, migrant children's educational funding remains allocated to their family's rural homes, even though their parents have migrated to an urban area. Consequently, the resulting shortage of educational funds in urban areas undermines the capacity of the local educational authorities to accommodate all students, migrant and urban. Some urban public schools occasionally recruit migrant children, on the condition that they can meet the requirements of extra high tuition fees (Goodburn, 2009). Nevertheless, for the majority of migrant children who hold the agricultural household registration, fewer opportunities are available for enrolment in urban public schools than for urban children generally (Li, 2012). To address these challenges, private migrant schools have been established to provide educational opportunities for migrant children, without the limitation of household registration and expensive school admission, but at the expense of being 'quite frankly in miserable condition' as well as having 'poor equipment, and few qualified teachers' (Xia, 2006, p. 39).

Given efforts made during last decade, the Chinese government has gradually taken measures to ameliorate the problems which surround the integration of migrant children in urban areas. Several regulations and laws have been promulgated to guarantee access to urban public schools for migrant children. Furthermore, the latest State Council officially issued 'Opinions on Further Promotion of the Reform of Household Registration System' which states that there is no difference between rural and urban residence, and moreover, that rural–urban migrant people are encouraged to live in urban areas. This indicates that Chinese urban schools will be expected to serve greater numbers of rural–urban migrant children in the following decades. According to the statistics, the proportion of migrant children enrolling in public school grew to more than 50 percent in large cities such as Beijing and Shanghai (Wang, 2009).

Meanwhile, the local Ministry of Education has strengthened the school quality of migrant schools by arranging a standard curriculum and pedagogical approach between migrant schools and public schools. For example, in Shanghai urban schools, the 'Curriculum guides for primary and secondary schools in Shanghai' has been published in each academic year since 2004 (MoE, 2014). This document requires that all of the schools within Shanghai districts are arranged with the same schedule of teaching subjects, textbooks, teaching time, and students' out-of-class activity. Moreover, all of the students in Shanghai schools are required to speak official language (mandarin), either migrant or non-migrant children (Qi and Tang, 2011); and complete nine-year of compulsory education.

Despite these improvements, the general problem of educational inequality persists and scholars are now addressing the evidence which contrasts migrant students' disadvantaged learning environments in segregated migrant schools in comparison to public schools. Improved school outcomes in mathematics for migrant children are essential for their upward mobility and opportunity for future success (Bankston, 2004; Levels et al., 2008). Therefore, this paper will examine the mathematics achievement of migrant students between school types and the related predictors of school achievement, in order to provide policy-makers, migrant families and schools suggestions to better support migrant students academically in migrant schools and in public schools respectively. In the following section, the review will focus on studies related to the prediction of mathematics achievement for migrant children. Attention is given to the few Chinese studies related to the education of migrant children in urban areas which have examined the public and private provision of primary education, particularly in relation to migrant children's achievement in mathematics.

1.2. School type and mathematics achievement levels

In this paper, two types of schools for migrant children in urban areas were included in this study: segregated migrant children's schools (migrant schools) and public integrated schools (public schools). Much literature has examined how racial and socioeconomic segregation contributed to the achievement differences among students (Agirdag et al., 2012; Rumberger and Palardy, 2005). In particular, the impact of socioeconomic school segregation has been found to be greater than that of ethnic school segregation, in having a negative influence on the scholastic achievement of immigrant students (Dronkers and Levels, 2007). Previous studies on privately segregated migrant children's psychological health and peer relationships have identified that migrant children sometimes suffer slight psychological health problems (Tao et al., 2004) and develop poor learning habits (Liu, 2007). In contrast, migrant children's adaption in integrated public schools is better than that in migrant schools, regardless of the student's grade level (Li et al., 2009; Shen, 2008). Migrant children in public schools also display more satisfaction with their schooling than migrant school students in private schools (Xie, 2007).

In terms of academic achievement of migrant children, there has been no national study that comparing mathematics achievement of migrant students in China. In many public schools, mathematics achievement of migrant students was excluded from the total sample of evaluation of school teaching outcomes. Take the Program for International Student Assessment (PISA) for example, migrant students were not selected to represent the sample of public schools in Shanghai (Sellar and Lingard, 2013). The few studies that have focused on migrant children's mathematics achievement within a limited region indicate that migrant children in public schools perform better than migrant students in migrant schools (Lai et al., 2014).

In predicting mathematics achievement of migrant students, some studies have regarded access to public schools as a key factor in determining educational quality for migrant children in urban schools (Chen and Feng, 2013). Other comparative studies of school type have revealed that a higher migrant family income increases the likelihood of attending public schools (Lu, 2007), postulating that differences in family background may explain part of the achievement gap between school types. Nonetheless, there is no consensus on the predictors of whether individual, family, and school determining mathematics achievement of migrant students. Particularly the prediction of mathematics achievement of migrant students between migrant schools and public schools is required further investigation.

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