Migrants' Family Arrangement and Their Children's School Performance in China

Abstract

As China is experiencing an urban revolution with massive rural-to-urban migration, millions of children are profoundly affected by their parents' migration. With the discriminatory Hukou system and harsh living and working condition in cities, the dilemma migrant parents face is whether they bring their children to cities or leave them behind in the countryside. This painful decision determines their children' household and school environment, which in turn shape their wellbeing. This paper focuses on children's educational wellbeing, and study how it is affected by different family arrangements among migrants. We compare school performance of "left behind children" to "migrant children", and study differentiated effects of key risk factors such as housing condition, gender and financial gains. The effect of family arrangement is complex, which is conditioned on household wage income and children's gender. The effects of other key risk factors also vary between family arrangements. These findings demonstrate the importance of family arrangement in children's educational wellbeing.

Keywords: education, migration, migrant children, left-behind children, gender, China

Migrants' Family Arrangement and Their Children's School Performance in China

Introduction

Children of today are the citizens, workers, and parents of the future. Children's well-being especially their educational wellbeing has long-term consequences for social class positions when they become adults (Hayward and Gorman, 2004; Palloni, 2006); thus it is essential to the health and economic vitality of future society. China is in the midst of an urban revolution and is experiencing the largest human migration in history, with more than 200 million migrants in Chinese cities every year (CSCIEAS et.al, 2010; OMSM, 2010). While young, single men and women have been the typical profile of migrants, families with children are increasingly more common. In 2009, about 30% of migrants have school-aged children (5-18 years old) (Huang and Tao, 2015), and children of migrant workers account for about one quarter of all children in China (Chan, 2009). Thus in rapidly urbanizing China, children in migrant families are a huge and particularly vulnerable group whose well-being is in dire condition.

Due to the risky nature of migration and various institutional barriers in Chinese cites, many migrant parents leave children behind in villages. It was estimated that there were 61 million (38% of all rural children, and 22% of all children in China) so-called "left-behind children" (children living in villages with at least one parent away as migrant) in 2010, of which 47% had both parents as migrants, 36% had a migrant father and 17% had a migrant mother (ACWF, 2013). Parental absence and thus the lack of effective parental monitoring have led to poor

academic performance and problematic behaviors among "left-behind children" (Huang, 2004; Lin, 2003).

But increasingly, migrant families bring their children to cities (these children are called "migrant children"). In 2001 there were 14 million "migrant children" (Liang et al., 2008) and in 2009, 45% of migrant families with school-age children bring their children to cities. Yet, most "migrant children" have to enroll in unlicensed, unregulated, poor quality private schools targeting "migrant children" only, despite the central government's call for equal treatment of "migrant children" in school admission (Han 2002; Cheng and Liang, 2009; Tan, 2010). In addition, most migrants live in extremely poor housing condition and they move frequently due to job insecurity, which can hamper their children's wellbeing. The stark contrast with their urban peers in living and educational conditions may also hinder their psycho-social development. Thus despite living with parents in cities, "migrant children" may not benefit from the superior education resources and opportunities in cities; but rather they may suffer from the poor and unstable living and education conditions in cities.

This paper studies how different family arrangements among migrants impact their children's wellbeing, focusing on school performance. Academic performance not only indicates children's wellbeing at the present time but also signals their prospects for a good life in the future (Schoon, 2006). Education has long been considered by Chinese the main path for social mobility with the scholar-official system in imperial China. In particular, since the implementation of the Household Registration (Hukou) System in the late 1950s, education has been considered the only path for children in rural areas to move up the social ladder. During the socialist era and

even today, passing the college entrance exam not only allows students to go to college for higher education, but also allows rural students to change their agricultural hukou into non-agricultural hukou. It has been well documented that non-agricultural hukou holders are privileged in social economic status and opportunities (Cheng and Selden, 1994). Despite the recent changes in the hukou system, it remains one of the most important institutions in China. Thus academic wellbeing is particularly important to children from the rural areas, many of whom have migrant parents. In fact, to make sufficient money for children's schooling is often a main motivation for parents' migration (Yao and Shi, 2009).

While the comparison between children of migrants and those of non-migrants in either origin or destination is important, in this paper we focus on children of migrants only, comparing "left-behind children" in origins to "migrant children" in destinations. For migrant parents, the central question is which of the two family arrangements – bringing their children to cities and leaving them behind in origins – is better for their children, while they are less concerned about whether their children will be better than those of non-migrants. By comparing "left behind children" with "migrant children", we aim to exam how different family arrangements among migrants and consequent household and school environment affect their children's school performance.

Specifically, we aim to answer the following research questions:
1) How does migrants' family arrangement affect their children's school performance? Do "migrant children" fare better than "left-behind children"? Do main risk factors affect "migrant children" and "left-behind children" differently?

3

2) What is the impact of housing condition on children's school performance? Do residential crowding and housing instability affect children's school performance?

3) What is the role of gender of both children and absent parent? Do children with different sexes respond to family arrangement and other key risk factors differently? Does the sex of the absent parent matter to children's school performance?

This paper joins the emerging research shift from focusing on migrants' economic strategies to the wellbeing of their children by focusing on children's school performance. Instead of focusing on school enrollment as most existing studies do, we study both subjective and objective evaluations on children's school performance, which will give us a better understanding of their educational well-being. Furthermore, most existing studies on children in migrant families focus on either "left-behind children" or "migrant children". We believe it is necessary to compare children in different migrant families and study how different family arrangements among migrants affect children differently. In addition to common risk factors, we also study factors that have not been studied in children's education, such as their housing condition, which varies significantly between "migrant children" in cities and "left-behind children" in the countryside.

 In the following sections, we will first review the literature, lay out the conceptual framework and set up hypotheses. Then we will discuss data and methodology, followed by empirical analyses, and conclusions.

Literature Review, Conceptual Framework, and Hypotheses

There is a large body of literature on migration and child development, respectively, but there are limited overlaps. The former has focused on adult migrants and their economic strategies, with few attentions to their children, while the latter has focused on the general population of children, with few attentions to children in migrant families. With the increasingly high mobility, there is a massive volume of children in (im)migrant families in both developing and developed countries (Whitehead and Hashim, 2005; Bryant, 2005; Hernandez et al., 2009). While migration generally advances the family economically, it has profound long-term impact on children. Thus there is an urgent need to study the wellbeing of children in migrant families, and to bridge the two separate bodies of literature on migration and child development.

There is a research shift from migrants to their children. Since 1965 when family reunion became one of the key cornerstones in immigration policy in the US, there has been an intensified interest on immigrant children in the U.S. (e.g. Hernandez, 1999; Hernandez and Charney, 1998; Portes, 1996; Portes and Rumbaut, 2005; Kasinitz et al., 2009; Crosnoe and Turley, 2011). Researchers also studied migrant children in developing countries, such as Mexico (McKenzie, 2005; McKenzie and Rapoport, 2005, 2006), Nicaragua (Edwards and Ureta, 2003), and Philippines (Yang, 2004). UNICEF recently launched a global research on the impact of migration on children (Hernandez et al., 2009; Bryant, 2005; Salah, 2008; Garza, 2010).

Focusing on children's education, the positive effect of parental migration mainly comes from

higher family income and remittance, as it reduces school drop-out rate, helps funding children's education, and delays children's entering labor force and thus increases final level of education (Cox-Edwards and Ureta, 2003; Bryant, 2005; Hanson and Woodruff, 2003). In fact the quest to earn sufficient funds for children's schooling is often a principal objective motivating parents' migration (Dreby 2010; Wan 2009; Yao and Shi 2009). Yet, the overall impact of migration on education can be negative due to factors such as the lack of parental involvement, the need to do house work, and the incentive system that discourages higher education (McKenzie and Rapoport, 2006; Hanson and Woodruff, 2003; Acosta, 2006). According to a case study of left behind children in China by Zhou et al. (2014), the positive effect of income from two-parent migrant families is not high enough to offset the negative effect of parental absence on boy's education. Paradoxically, immigrant children in the U.S. have better academic performance than children in native-born families despite their disadvantaged socio-economic status (Hernandez, 1999; Hernandez and Charney, 1998; Portes and Rumbaut, 2005; Kasinitz et al., 2009).

These mixed findings demonstrate the need for more research. Existing studies focus on either "left-behind children" or "migrant children", which also obscures findings. While migration may have different impact on these two groups of children, virtually no comparison has been made. In addition, existing studies on migrant children in developing countries focus on the role of remittance, leaving many other factors unexplored. This is where the literature on child development can enrich our understanding of children in migrant families.

Parental Absence   For the general population, it is well documented that parental absence and single parenthood adversely affects child's school performance (Ginther and Pollak, 2004;

McLanahan and Sandefur, 1994). Yet, the literature on the impact of parental absence due to migration on children is less clear cut, even though it is very common in developing countries as poor people have to sacrifice family bonds to strengthen their families economically (Chapman and Prothero, 1985; de Haan, 1999; Ellis 1998, 2000). Some studies report that parental absence due to migration leads to children's lower grades (Battistella and Conaco, 1998; Kandal and Kao, 2001; Landale et al., 2011), while others find either no effect or even positive effect on school performance (Bryant, 2005).

Housing Condition   In addition to physical health and social wellbeing (Breysse et al., 2004; Evans et al., 1998, 2000; Harker, 2006; Vandivere et al., 2006; South and Haynie, 2004), poor housing condition such as overcrowding and housing instability has negative impact on children's cognitive development and lead to lower educational attainment (Harker 2006; Vandivere et al. 2006). It is well documented that migrants tend to live in poor quality and unstable housing. Yet, existing studies on the impact of migration on children have largely ignored the role of housing condition, especially in developing countries.   Studies on immigrant children in the U.S. show that poor housing does not seem to negatively affect immigrant children's well-being (Hernandez, 1999; Hernandez and Charney, 1999). Yet, due to housing discrimination, immigrant children tend to live in poor housing in disadvantaged neighborhoods, and they are more likely to adopt adversarial attitudes and behaviors that can derail their educational success (Portes and Zhou, 1993; Zhou, 1997).

Gender   The role of gender has been largely ignored. The limited research finds that migration causes disruption of gendered divisions of parenting roles with fathers as disciplinarians and

7

mothers as the care givers (Kandal and Kao, 2001; Parreñas, 2005). Migration may exert a relatively neutral impact when the mother is present. Even though children feel distanced from their fathers, they appreciate his economic contributions (Asis, 2003; Lloyd and Blanc, 1996; Parreñas, 2005). Moreover, since the mother dispenses remittances, the needs of children are generally well catered for (Kabeer, 1994). In contrast, children with mothers absent are the most vulnerable, as it is more difficult for the extended family to substitute for the mother (Parreñas, 2005). In contrast, father-only migration is found to be the most advantageous to children because of increases in family income, the presence of the mother as care giver, and the support of the extended family (Jampaklay 2006; Parreñas 2005). In addition, children of different sexes may cope with migration differently. For example, in the case of a father's absence, the lack of role models negatively affects sons' academic performance, while daughters' appreciation of their mother's difficulties may cause them to study harder and perform better (Lloyd and Blanc, 1996).

This review demonstrates the urgent need to study children of migrants especially in developing countries, and the need to go beyond remittances to incorporate other risk factors that have shown to be important for child development. Within this global context, China deserves special attention due to the sheer volume of children in migrant families and the discriminatory Hukou System, which has exacerbated the impact of migration on children. The Hukou system ties territorial affiliation to public goods entitlements (Cheng and Selden, 1994). Migrants without local registration are not qualified for welfare benefits at the destination city such as subsidized housing and public education. Consequently, migrants mostly live in extremely crowded and poor quality housing (e.g. Wu, 2006; Wang et al., 2010; Huang and Tao, 2015). They also

experience frequent residential moves due to constant job changes. Previous studies have shown the negative impact of frequent moves on children's education outcomes (Coleman, 1988; Ziol-Guest, 2014).   Thus it is very difficult for migrants to provide decent and stable shelter for their children in cities. Migrants often have to work very long hours, which also makes it difficult for them to raise children in cities. In addition, most public urban schools either reject "migrant children" or charge fees too high for migrants to afford even though they are required by the central government to offer equal treatment to "migrant children" (Chen and Liang, 2009). Thus, if migrants bring their children with them to cities, their children have to be educated in unlicensed and poor quality migrant schools and live in crowded and unstable housing. These disadvantaged conditions in living and educational environment may negatively affect the well-being of "migrant children". Yet, sometimes migrants have to bring their children with them because there are no caregivers back in village, children are too young to be left behind, or children have problematic behaviors and need close parental monitor. Migrants are also more likely to bring sons (compared to daughters) to cities due to son preference.

Alternatively, migrants may leave their children behind to be cared by relatives, often grandparents. In addition to avoiding the harsh environment in cities, some migrants have to leave their children behind if their children are about to graduate from middle school or high school because school curriculum varies across administrative districts so students have to take the high school and college entrance exam at their Hukou registration places (Xiang, 2007). The stable and familiar environment back in village and sometimes children's good school performance may encourage migrants to leave their children behind. Regardless the reasons, migrants and their children have to endure the pain of split families. Thus the discriminatory

Hukou system has not only created a marginalized population of migrants but also forced their children into a disadvantaged position early in their lives that will have profound long-term impact on them.

There is an emerging literature on children of migrants in China. Yet existing studies tend to focus on either "migrant children" or "left-behind children". Several surveys find that "left behind children" fare poorly in school and have high dropout rates (Huang 2004; Lin 2003). In particular, "left behind children" with two migrant parents perform significantly worse in school while whose with one migrant parent do not seem to be affected (Zhou et al., 2014; Lee, 2011). Yet, "left behind children" are more likely to stay in school than other rural children (ACWF, 2013). Maternal and paternal migration also have different impacts on educational performance of "left behind children". Wen and Lin (2012) found "left behind children" in mother-only migrant families had the worst school performance compared to those in other migrant families and those in non-migrant families. Yet, Duan and Wu (2009) found that school dropout rate was the highest among "left behind children" living alone, followed by those with migrant mother and living with father, then by those with migrant father and living with mother, while children with two migrant parents and living with grandparents surprisingly had the lowest dropout rate. Furthermore, Zeng and Xie (2014) found that the education of co-resident grandparents has similar positive effect on their grandchildren's education as parents' education. This is different from findings in the West on the negative impact of grandparents as surrogate parents on children's education (Sawyer and Dubowitz 1994; Solomon and Marx 1995). While living with parents, "migrant children" have a lower school enrollment rate than non-migrant children

(Liang and Chen 2007), and they tend to enroll in poor-quality migrant schools (Chen and Liang 2009; Lu and Zhang, 2001).

Gender inequality in education is not unique to China. Yet, it has been worsened by the government's focus on economic development and recent market transition, even though girls' educational opportunities seem to be more responsive to better economic condition (Hannum and Xie 1994; Hannum, 2005). Furthermore, with decentralization in finance and decision-making in education in China, local communities such as villages and urban neighborhoods have become increasingly more important in garnering financial and social resources to support education, and girls benefit more from improved community resources than boys (Ross and Lin, 2003; Hannum, 2003). Thus it is imperative to understand how educational gender inequality among children of migrants has been affected by migration. Zhou et al. (2014) found only boys' school performance was adversely affected by two-parent migration, not girls'. In Gangsu province, Lee and Park (2010) found the correlation between high test scores and father-only migration is significant only among girls, which is a result of higher family income through father's migration and a nurturing environment with mother's presence and care. Yet, much is still unknown about how gender plays out in educational wellbeing among children of migrant families.

Whether to bring children to cities or leave them behind is an important decision for migrant parents, which has a profound impact on their children. The decision on family arrangement will create different household environment (such as parental absence, housing condition and economic condition) and school environment for their children, both of which can significantly

affect their school performance (Figure 1). First of all, different family arrangements among migrants lead to different degree of parental absence (or presence). If parents bring their children to cities, children obviously enjoy not only parents' care but also their help and monitoring in study. In contrast, if children are left behind, they suffer at least the absence of one parent, and often both parents, and consequently the lack of parental monitoring in their learning. Thus we hypothesis that "*migrant children" generally perform better academically than "left behind children" due to parental presence (H1).* Furthermore, while both parents' presence would be ideal, it is very common for children of migrants to live with only one parent or no parent. In the latter case, they often have to live with grandparents, or other relatives, or live in schools and even live alone. As discussed earlier, the gender of absent parent and the actual caregiver matters. We further hypothesize that *children living with both parents fare better academically than those with only one parent, and children living with mother do better than those with mother absent (H1.1).*

Secondly, different family arrangements lead to very different housing conditions for children, which shape children's study and living environment and thus affect their school performance. While living with parents, "migrant children" often have to suffer from severe residential crowding and housing instability, as migrants in Chinese cities generally live in poor and unstable housing due to their low income on the one hand and the discriminatory Hukou system on the other hand. In contrast, if children are left behind in the village, most of them can at least live in their own home with stability and ample space for their study and living. Thus we hypothesize that *children living in spacious and stable housing do better in school than those in crowded and unstable housing (H2).* As housing in rural China is predominately self-build

12

houses with relatively large floor space, we further hypothesize that *the effect of housing condition on school performance is more important for "migrant children" than "left behind children" (H2.1).*

Third, economic improvement resulted from migration can affect children's school performance. If migrants have more financial resources, they may hire tutors, buy more books for their children, and even pay fees for their children to go to better schools, which have direct impact on their children's school performance. In addition, they may be able to pay for more recreational and extracurricular activities for their children, which can indirectly benefit their children's school performance. Thus we hypothesize that *economic improvement from migration has positive effect on children's school performance (H3).* When children are living with parents, especially when mother is present, they are more likely to benefit from the financial improvement (Kabeer, 1994). Thus we further hypothesize that *the effect of economic improvement on children's school performance varies with family arrangement, with those with both parents being the largest, followed by those with mother only, then those with father only and those with others (H3.1)*

Forth, migrants' family arrangement also directly impacts the school their children attend, which can significantly affect children's school performance. If urban public schools at the destination city admit "migrant children" without additional fees, migrant children are more likely to attend public school in cities, which is usually better in quality than migrant schools. In contrast, "left behind children" have no option but to attend rural public schools, which tend to have poorer

quality than urban public school. Thus we hypothesize that *children who attend public schools perform better than those in private migrant schools (H4).*

In addition to the above migration/family arrangement induced factors, individual characteristics such as children's gender and age and household characteristics such as parents' education and number of siblings will affect children's educational wellbeing. We are particularly interested in the role of child's gender. Migration is a gendered process, so is the impact of migration on children. In addition to the gender of absent parent that matters to children's well-being, children of different sexes may respond to migration induced changes differently. For example, it is conventional wisdom that girls and boys mature and develop differently, and thus their needs for parental control differ. With parental absence, left behind girls may mature earlier and study harder, thus perform better while left behind boys may suffer from the lack of parental monitoring and perform worse. Similarly, with poor housing condition among migrants, migrant girls may not suffer academically as much as migrant boys do. On the other hand, due to strong son preference especially in rural China, economic improvement resulted from migration may benefit boys more than girls. Thus we hypothesize that *boys benefit more from economic improvement from migration than girls, but boys suffer more from the negative impact of migration such as parental absence and poor housing condition than girls (H5).*

Empirical Analysis

Data and Methodology

This project utilizes a 12-City Migrant Survey conducted in 2009. These cities are located in four major urbanized regions in China – the Yangtze River Delta, the Pearl River Delta, the Bohai Bay Area, and Chengdu –Chongqing region. In each of these four regions, one megalopolis (> 1 million population), one large city (500,000 - 1 million), and one small/medium-sized city (< 500,000) were randomly selected. Sampled cities include Ninbo and Yueqing in Zhejiang province, Jiangyin in Jiangsu Province, Guangzhou, Zhongshan and Dongguan in Guangdong province, Chongqing, Nancong and Chengdu in Sichuan province, and Yanjiao in Hebei province, Jinan and Weifang in Shandong province (see Appendix F.1). Due to a large number of migrants in megalopolis, only one urban district is randomly selected in the megalopolis, while in smaller cities all urban districts are included in the sampling frame. Then 200 migrants in each city (2400 migrants in total) were randomly selected from the migrant registration list provided by local Public Security Bureau[i]. Migrants are defined as people whose Hukou is not registered in the city they live in at the time of survey, and they have left their Hukou registration places for more than three days. Detailed information about migrants' various aspects of livelihood, including demography, employment, income, housing, health, and social network, and information about their families including their children left-behind in villages was collected. The surveyed migrants come from 31 provinces and municipalities across China, with 62.39% of them married. There are 1515 children from 693 households, 81.12% (1229) of them are school-age (5-18) children. In this study we focus on rural-to-urban migrants and their children aged 6-15 (elementary and middle school age) as China has a 9-year compulsory education system. The final sample size is 753 children, of which 97% are enrolled in school, and 55% of those enrolled are "left behind children".

Measuring School Performance (Dependent Variables)

This survey is about migrants, not their children per se. Thus measures for children's school performance are limited. While performance in English is collected, about 30% of students do not have access to English classes due to their young age and the curriculum design. Thus we focus on school performance in math and Chinese language. Due to the sampling design, children's school performance is reported by migrant parents who in the case of "left behind children" are not the actual caregivers. Acknowledging parental reporting on children's school performance may be biased, we use both subjective and objective measures to mitigate the bias. School performance is measured with performance in math and Chinese (ranked by parents on a scale of 1-5, with 1 being the poorest and 5 being the best), and whether the child received any award from school for academic excellence (yes/no). While we realize there are large variations between regions and schools regarding academic award, academic award is a fairly objective measure within the school. In addition, children have always been the focus of Chinese families, who receive close parental monitor regardless where they are. Especially among migrants who desperately want their children to move up the social ladder, it is fair to assume that they are relatively well informed about their children, even though they may not be the actual caregivers. The availability of low-end cheap wireless technology in China such as the Little Smart (xiao ling tong) has made it easier for migrant parents to keep in touch with and monitor their children back home (Cao, 2009; Qui, 2009). Thus we believe the combination of these indicators can give us a fairly accurate picture of children's academic performance.

Family Arrangement among Migrants and the Test for Endogeneity

"Family Arrangement" among migrants can be complex.   Depending on where the children are,

migrant families can be divided into those with "migrant children" and those with "left behind

children". Then depending on who the children are living with, those with "migrant children"

can be further divided into "migrant children" living with both parents, with mother only, and

with father only; those with "left behind children" can be further divided into "left behind

children" living with mother only, with father only, with no parents, living with grandparents,

with no parents and living with others[ii].   According to Table 1, there are slightly more "left

behind children" than "migrant children" (54.3% vs. 45.7%). Among "migrant children", the

majority of them are living with both parents, while among those left behind, the most common

arrangement is living with grandparents only (29%). A close look at those left behind living

with others (13%), the majority of them are living alone with no adult caregivers, while some are

living with school teachers and relatives. If children are left behind with one parent, it is much

more likely to be living with mother than father only (8.8% vs. 2.8%).

Family arrangement can significantly affect children's educational well-being in many different

ways. In particular, it affects the type of schools children attend and the type of households

children live in, the two most important environments shaping children's wellbeing. If children

are left-behind, they usually attend rural public schools in their hometown, which tend to have

qualified teachers and formal curriculums. This is beneficial to their educational development.

They generally live in stable and spacious housing, which can also be beneficial to their

education. Yet with one or both parents away, left-behind children do not receive close parental

monitor. Furthermore, the actual caregivers such as grandparents may have low or no education themselves, and may not have sufficient knowledge about school curriculum, which can negatively affect their educational well-being. If there are no caregivers available in hometown or the child needs close parental attention because either he/she has problematic behaviors or he/she is about to take major exams such as high school and college entrance exams, one parent may stay behind with the child. Yet, family income will be lower than the case when both parents are working in cities, which may discourage parents to invest more in their children's education.

 In contrast, while some "migrant children" may be able to attend superior public schools in cities, the majority of them go to private schools that target "migrant children" only, which are usually unregulated, poorly funded, and often have unqualified teachers and poor facilities. Thus although "migrant children" live with parents who may offer tutoring and emotional support, their "formal" education in cities is weak, which may negatively affect their educational well-being. They usually live in extremely poor and unstable housing, which can further impair their school performance. Yet, with both parents working in cities, family income is often higher than otherwise, although the cost of living is higher in city as well. With children living with them, migrant parents are also more willing to invest in their children's education than otherwise when they send remittance back for someone else to spend on their left-behind children. In other words, "migrant children" may benefit more directly from family's economic improvement. In addition, parents who bring children to cities may be more invested in their children's education, thus "migrant children" tend to do better.

At the same time, children's school performance may determine family arrangements among migrants. For example, migrants may bring their children to cities because their children are not doing well in school and thus need closer monitor, or they leave their children behind because they are doing well academically. In other words, "family arrangement" might be endogenous to children's academic performance. We use instrumental variables (IVs) to test potential endogeneity and to address the selection bias. In addition, with cross-sectional data, the relationship between family arrangement and well-being may be artifact of reverse causation or incidental association. IVs allow us to identify the causality between family arrangement and children's well-being (Winship and Morgan, 1999; Song and Lin, 2009).

IVs are expected to have significant impact on "family arrangement" but not on children's school performance directly except through "family arrangement". There are three candidates for IVs: 1) Presence of at least one grandparent in hometown. It is a norm for grandparents to take care of grandchildren in China. The presence of at least one grandparent might greatly influence migrant parents' decision regarding whether leave their children behind, but will not impact on children's educational achievement unless through the pathway of living arrangement.
2) Migrants' intention to stay in cities. Migrants' intention to stay will affect their family arrangements, but won't directly affect children's school performance. 3) Number of relatives and friends in the city. This variable measures social support and social network migrants have in cities. With a larger number of friends and relatives in the city, migrants are more likely to bring their children to cities as they may have more information (on education) and enjoy more social support in childcare. Yet, it should not affect children's school performance.

These three variables can affect migrants' decision on family arrangement, but won't directly affect children's academic performance. Thus they are good candidates for IVs. Yet, our endogeneity test results show that there is no endogeneity between whether bring children to the city or not and children's school performance, by taking into account of any of the three IVs and all three combined. A simple regression on two-category family arrangement ("migrant children" vs. left behind) against each of these IVs reveals that while "presence of grandparents in hometown" and "migrant parents' intention to stay in the city" are good candidates for IVs with large F-values (7.1 and 16.53 respectively), the "number of relatives and friends in the city" is not a good IV (F < 0.62) (see Appendix T.1). A two stage least squared regression (2SLS) was therefore performed for the first two IV candidates against grades of the subject "Chinese", followed by diagnostics. An overidentification test for the two IVs reveals that they jointly passed the exogeneity test (Sargan N*R-sq test=0.618). However, they both failed the Durbin-Wu-Hausman test (p-value= 0.172), indicating that endogeneity is not a problem. We further test whether there is endogeneity between grades and the six-category family arrangement[iii]. A set of tests were performed using the same two IVs. The results are similar as above, and we conclude that we did not find evidence of endogeneity in this case.

Descriptive Analysis

According to Table 2, "left behind children" are much more likely to be in the category of "poor" and "very good", but much less likely to be in the category of "medium" than "migrant children". For example, 4.04% of "left behind children" are "poor" in Chinese, compared to 1.53% of

"migrant children"; yet meanwhile 18.63% of the former are "very good" in Chinese, compared to 14.50% of the later. In contrast, 38.2% of "left behind children" are in the category of "medium", compared to 45.8% of "migrant children" for Chinese. Similar pattern exists for math performance as well. The differences in proportions between all "left behind children" and all "migrant children" are statistically significant for the category of "poor" and "medium" for Chinese, and for "poor", "medium" and "very good" for math.   In other words, school performance among "left behind children" tend to be more spread out with a higher percentage in either the "poor" or "very good" category than "migrant children", while "migrant children" are more likely to be concentrated in the category of "medium". There are differences among different sub-family arrangements. While "migrant children" with both parents do not necessarily perform better than those with only one parent, "left behind children" with mother only seem to perform better than those with father only. "Left behind children" with grandparents have a similar percentage in "very good" (18.62% for Chinese) to left behind with mother only, but higher than "migrant children" with one or both parents. Interestingly, "left behind children" with others are most likely to be in the category of "very good" (19.12% for both math and Chinese), even though they are also much more likely to be in "lower medium" (17.65% for Chinese, 19.12% for math) than any other family arrangement.   These results show the impact of living arrangement on school performance is very complex, and we should abandon the simplistic view that "left behind children" suffer academically due to parental absence.

Not surprisingly, there is a significant gender difference especially in Chinese. Girls are significantly more likely to be in the category of "medium" in Chinese than boys, while much

less likely to be in every other category (Table 3). In other words, boys are more spread out between categories in Chinese performance while girls are more concentrated in the category of "medium". For math, the gender difference is not significant except the category of "poor".

Model Specification and Regression Analyses

Both binary logistic regression and ordered logistic regression are used. For dependent variable whether children receive award for academic excellence (yes/no), binary logistic regressions are conducted. For performance ranking for Chinese and math (1 - 5), ordered logistic regressions are used, which is similar to binary logit model except that the event of interest is observing a particular score or less (Long, 1997). Since the survey was a random sample of migrants, not children, and 59% of migrant families have two or more children included in the analysis, we need to account for the correlation between children of the same migrant family. For binary outcome (receiving award or not), we adopt Generalized Estimating Equation (GEE) model to control cluster effect. For ordered outcomes (performance ranking for Chinese and math), Generalized Linear Model (GLM) with multinomial distribution and cumulative logit link is used to correct for clusters as it is the closest method to GEE in a binary outcome.

Because of the complex family arrangement among migrants, we adopt a two-step modeling approach: we first run models for all children, with a dummy variable indicating the two types of family arrangement -- "migrant children" vs. "left behind children". This can test the effect of migration (vs. left behind) on children's school performance. We then run two sets of models for "migrant children" and "left behind children", respectively, with detailed family arrangements

indicating whom the child is living with. This will further test the effect of parental absence and gender of the absent parent on children's school performance (H1and H11).

In addition to family arrangement, we include the following key risk factors as key independent variables to test our hypotheses:

Housing condition can affect children's school performance through residential crowding (per capital living space) and residential instability (number of moves in the city). This is to test hypothesis 2. While housing tenure potentially can be important, migrant children predominantly live with parents in rental housing, and left behind children predominantly live in their owned houses. Our analyses also show that tenure has no significant effect on school performance. Thus we focus on the effect of residential crowding and instability on school performance.

Economic improvement is measured using household wage income from employment in non-agricultural organizations in 2008, taking the natural log form. This is to test hypothesis 3.

Type of school, a categorical variable with urban public school, migrant school, rural public school, and others, is included to test hypothesis 4. In the model for all children, since left behind children are exclusively in rural public schools, urban and rural public schools are combined, in contrast to migrant schools and other types of schools.

Gender of the child is used to test the effect of gender on school performance (H5).

In addition, we include two sets of interactions: 1) interactions between family arrangement and other key risk variables; 2) interactions between gender of child and other key risk variables.

The first set of interactions tests if key independent variables affect school performance differently between different family arrangements (hypothesis 2.1 and 3.1), while the second set of interactions tests if children with different sexes cope with migration and its consequent household changes differently (hypothesis 5).

Control variables include those at individual and household level, such as child's age, mother's and father's education, and number of siblings. We also include a city-level policy variable indicating whether public schools in migrant destination city require extra fees for "migrant children" (yes/no)[iv]. Summary statistics for independent variables are listed in Table 4.

There are three ordered logistic regressions: model 1 with main effects, model 2 with interactions between family arrangement and key risk factors, and model 3 with interactions between gender and key risk factors. Regression results for performance in Chinese are presented in Table 5 (all children), Table 6 ("migrant children") and Table 7 ("left behind children"), and results for math are similar (see Attachment T2.1 - T2.3). According to Table 5, Model 1 shows that bringing children to cities by itself does not seem to have an effect on their Chinese performance. Therefore, we don't have enough evidence to support H1. However, when interactions between family arrangement and key risk factors are included, as shown in Model 2 in Table 5, it seems that bringing children to cities is beneficial to children's Chinese performance but only when non-agricultural income is relatively low. As household income increases, the advantage of bringing children to cities begins to taper off, and the tipping point is around 25,000 yuan, which is lower than both the mean and median of non-agricultural wage income.

Among "migrant children" (Table 6), those living with one parent interestingly has a positive effect, compared to living with both parents, when nonagricultural wage income is relatively low (Model 2) [v]. This positive effect tapers off as non-agricultural income increases, and the tipping point is around 18,000 yuan non-agricultural income when migrant children living with two parents become beneficial to children's Chinese performance. In addition, "migrant children" living with one parent only has a positive effect on girls' Chinese performance (1.867 in Model 3), but it has a negative effect on boys (the coefficient for interaction is -3.009). In Table 7 for "left behind children", left behind living with grandparents seems to have a positive effect on Chinese performance when nonagricultural income is on the lower end, and the effect tapers off at around 30,000 yuan. Interactions between gender and other key risk factors are not significant among left behind children, indicating there is no gendered effect among left behind children.

Similarly, bringing children to cities vs. left behind itself is not significant regarding whether children receive academic awards from school (Model 1 in Table 8). Yet, migrant children living with one parent is beneficial to girls but detrimental to boys (Model 3 in Table 9), while left behind children living with mother are statistically more likely to receive academic awards from school (Model 1 in Table 10). This shows the effect of family arrangement on children's school performance is complex, which is conditioned upon household income and children's gender.

Secondly, overall, housing condition seems to be marginal to school performance. Neither residential crowding nor residential instability (number of moves) is significant when all children are combined (Table1 in Table 5). The only exception is in Model 3 which shows number of

moves interestingly has a positive effect on migrant girls. While the number of moves indicates residential instability, it can also be a result of upward housing mobility as migrants improve their housing conditions in cities. Thus H2 is not supported. Similarly, regarding receiving academic award, the number of moves has a positive effect on girls but not on boys (Model 3 in Table 8). This shows gendered response to residential instability, supporting H5. Among "migrant children" (Table 6), residential space also has a positive effect on girls (0.031 in Model 3), while it is not significant among "left behind children" (Model 3 in Table 7). This shows while the effect of housing condition might be marginal, it is more important among "migrant children" than "left behind children", especially migrant girls benefit significantly from improvement in residential crowding. This supports H2.1.

Thirdly, economic improvement from migration has different impact on "migrant children" and "left behind children", with a significant negative effect on the former (Model 1 in Table 6), but positive effect on the latter (Model 1 in Table 7). A possible explanation for the negative effect on migrant children is that the economic improvement from migration might be offset by the higher living and education cost in cities, thus migrants have much less financial resources to be invested in children's education. In contrast, the cost of living and the cost for education in rural areas are lower, and any economic improvement can have a large impact on the education of left behind children. It also has a positive effect on receiving awards among left behind children (Model 1 in Table 10). Thus H3 is only partially supported. The significant interactions between income and family arrangement show that the negative effect of income on migrant children is even worse when they live with only one parent (Model 3 in Table 6, coefficient for the interaction = -1.01), and the positive effect of income on left behind children is compromised

when left behind children are living with grandparents (Model 3 in Table 7, coefficient for interaction =-1.359). This supports H3.1.

Fourthly, as expected, children who attend public schools have better performance and are more likely to receive awards (Table 5, 8), and migrant children who attend urban public schools do better (Table 6, 9), supporting H4.

Finally, gender has a consistent negative effect on Chinese, meaning boys generally do worse than girl in Chinese. Gender is less significant in math performance and receiving awards. Furthermore, migrant boys living with one parent do worse in Chinese and are less likely to receive awards (Model 3 in Table 6, Model 3 in Table 9), indicating migrant boys are more likely to be negatively affected by parent absence. This supports H5. In contrast, among left behind children, there does not seem to be a gendered effect through family arrangement. Although positive, the interactions between boy and wage income are not significant among either "migrant children" or "left behind children" (Model 3s in Table 6, 7), which shows the economic improvement from migration does not necessarily benefit boys more than girls, a sign for weaker son preference among migrant families. Interactions between gender and housing condition are not significant either.

Conclusion and Discussion

As China aims to accelerate urbanization in the coming decade, another 250 million rural-to-urban migrants are expected (Johnson, 2013). There will be even more children than today who will be affected by their parents' migration. It is utterly important to study how children are affected by their parents' migration and what the government can do to mitigate the negative impact of migration on the citizens of the future. With the discriminatory Hukou system and harsh living and working condition in cities, the most important question for millions of migrant parents is whether they should bring their children to cities or leave them behind in the countryside to be cared by others. This painful decision will determine the household and school environment their children live, which in turn can significantly shape their wellbeing.

This paper focuses on family arrangement among migrants, and studies how different family arrangements among migrants determine various aspects of the household and school environment, which in turn affect children's academic wellbeing. Instead of comparing children of migrants with those of non-migrants either at origin or destination, we compare "migrant children" with "left-behind children", which allows us to better understand migrant parents' decision making regarding their family arrangement, and its differentiated impact on their children's school performance. In addition to parental absence and economic condition as commonly studied in existing research, this paper also examines factors that have not been explored in existing studies, such as housing conditions. Furthermore, we consider the impact of migration as a gendered process, with the gender of both children and the absent parent, as well as their interactions with other key risk factors being important to children's school performance.

Our empirical analyses show that family arrangement does not have a clear cut effect on children's school performance, which is conditioned upon household wage income and children's gender. Overall, migrant children do not necessarily do better than left behind children. Yet, when household wage income is on the lower end, bring children to cities seems to be beneficial to children's school performance. Among "migrant children", living with both parents is beneficial only when household wage income is relatively high, while living with only one parent can be beneficial when income is on the lower end. This is probably due to the higher living cost in cities. Yet, migrant children living with one parent is beneficial to girls but detrimental to boys, demonstrating the negative impact of parental absence only among migrant boys. "Migrant children" who attend urban public school clearly do better than otherwise.

Among "left behind children", those living with grandparents and those living with mother tend to do better than other arrangements. This shows the importance of nurturing caretakers to children's school performance, and in the Chinese context, grandparents can to some degree mitigate the impact of parental absence on children. In fact "left behind children" with grandparents perform better than those living with father only.

In addition, other key risk variables have differentiated effects on children's school performance depending on family arrangement. For example, financial gains from parents' migration have a positive effect on children's school performance *only* among "left behind children". This positive effect is somewhat compromised when grandparents are the caregivers and when income is on the lower end. A possible explanation is that when wage income is low, migrants' remittance can be small, and grandparents may not invest limited remittance into education. In

contrast, the impact on "migrant children" is either not significant (for math and awards) or marginally negative (for Chinese performance). In addition to migrants' low wages in Chinese cities, this may be a result of more costly living in cities where migrants have to spend much of their financial gains from migration for housing, food, and transportation rather than their children's education. Furthermore, housing condition is important to school performance *only* among migrant children. Especially migrant girls benefit from spacious dwelling while migrant boys do not seem to benefit.

These findings demonstrate the undoubted importance of family arrangements among migrants, which not only affect their children's academic performance directly, but also indirectly through housing condition, wage income, and school quality. Thus the government has to reform its migration policy and the Hukou system to ensure children in migrant families to benefit from the positive impact of migration and to minimize the negative impact of migration. Based on our findings, we argue that the government should create a set of family-friendly policies to encourage migrants to bring their children especially girls to cities, encourage both parents to live with their children in cities, allow migrant children to attend urban public schools, and raise minimum wage to ensure migrants can afford decent housing and standard of living for their families, all of which have positive effect on children's academic wellbeing. In addition, the government should incorporate qualified migrants into subsidized low-income housing programs in cities, and give them equal access to low-income housing, which not only will encourage them to bring their children to cities but also has a positive impact on children's educational wellbeing. While not studied in this paper, allowing migrants' children to take major exams such as high school entrance exam and college entrance exams at their destination city instead of their hukou

registration place should also encourage migrants to bring their children to cities. It is inevitable to phase out the Hukou system, allow migrants to settle permanently in cities, and enjoy their right to the city in every aspect so that we can ensure the ultimate wellbeing of millions of children in migrant families. If children have to be left behind, migrants should be encouraged through educational programs to leave their children with mother, followed by grandparents, as children in these two family arrangements fair better. Remittance should also be encouraged through higher wage income, as it can have a significant positive impact on left behind children's school performance.

In the coming years, the Chinese government has to shift its focus from reaping migrants' economic contribution to care for the wellbeing of not only migrants but also their children. Concrete policies and programs have to be set up to ensure the wellbeing of millions of children in migrant families. Only then, a smoother urbanization and a stronger society can be achieved, and the "urban dream" may be realized in China.

Since the data we use is a survey on migrants, not their children per se, measures for school performance are limited. This may impose limitations to our findings. Thus there is an urgent need to survey children in migrant families, both "left behind children" and "migrant children" to collect more detailed and accurate information on their school performance as well as household, school, and community level information. More research is needed to have a clearer picture of the impact of migration and family arrangement on children's educational wellbeing.

References:

Acosta, Pablo. 2006. "Labour supply, school attendance, and remittances from international migration: The case of El Salvador." World Bank Policy Research Working Paper No. 3903.

Acosta, P., P. Fajnzylber and J. H. Lopez. 2007. The Impact of Remittances on Poverty and Human Capital: Evidence from Latin American Household Surveys. World Bank Policy Research Working Paper No. 4247, Washington.

All-China Women's Federation (ACWF), 2013. "Research Report on the Situation of Rural Left Behind Children and Rural to Urban Migrant Children", *China Women's Movement*, 6: 30-34 (In Chinese).

Angrist, Joshua, 1991. "Instrumental Variables Estimation of Average Treatment Effects in Economimetrics and Epidemiology, Working paper 115. Cambridge: Mass: National Bureau of Economic Research.

Asis, M.B., 2003. *Hearts Apart: Migration in the Eyes of Filipino Children*, Scalabrini Migration Centre, Philippines.

Battistella, G. And C. Concaco (1998), "The Impact of Labor Migration on the Children Left Behind: A Study of Elementary School Children In The Philippines", *Sojourn*, 13(2), 220–241.

Beine, M., F. Docquier and H. Rapoport, 2001, "Brain Drain and Economic Growth: Theory and Evidence", *Journal of Development Economics*, 64(1), 275–289.

Beine, M., F. Docquier and H. Rapoport, 2003, "Brain Drain and Growth in LDCs: Winners and Losers", Paper presented at the European Economic Association Congress, August 2001.

Bertoli, S. 2007. Great Expectations – An Assessment of the Development Promises of Workers'

Remittances. Ph.D. dissertation, University of Florence.

Borgers, N., Dronkers, J., & Van Praag, B. M. S. (1996). The effects of different forms of two- and single-parent families on the well-being of their children in Dutch secondary education. *School Psychology of Education*, **1**, 147–169.

Bratt, Rachel G., 2002. "Housing and Family Well-Being." *Housing Studies* 17, (no. 1): 13-26.

Breysse, Patrick, and others, 2004. "The Relationship between Housing and Health: Children at Risk," *Environmental Health Perspectives*, 12, (no. 15): 1583-88.

Bryant, John. 2005. Children of International Migrants in Indonesia, Thailand and the Philippines: A Review of Evidence and Policies, UNICEF Innocenti Working Paper 2005-05.

Cao, H., 1997. Where to Put Their School Desks? *China News Digest*, 315: 3-6.

Cao Jin. 2009. "Chuanbo jishu yu shehui xingbie: yi liuyi shanghai de jiazheng zhongdian nvgong de shouji shiyong fenxi weili" [Communication Technology and Social Gender: A Case Study of Mobile Phones by Female Hourly Domestic Workers in Shanghai]. *Xinwen yu chuanbo yanjiu [News and Communication Research]* 1:71-77.

Chan, Kam Wing. 1994. *Cities with Invisible Wall, Reinterpreting Urbanization in Post- 1949 China*. Hong Kong: Oxford University Press.

Chan, Kam, Wing, 1996. Post-Mao China: A Two-Class Urban Society in the Making. *International Journal of Urban and Regional Research* 20: 134-50.

Chan, A. 2009. Paying the Price for Economic Development: The Children of Migrant Workers in China. *China Labour Bulletin Special Report*. Retrieved from http"//www.china-labour.org.hk/en/files/share/File/research_reports/Children_of_Migrant_Workers.pdf.

Chapman, M. and Prothero, R.M., 1985, "Themes on circulation in the Third World" in R. M. Prothero and M. Chapman, (eds), *Circulation in Third World Countries*, London: Routledge

Chen, Yiu Por and Liang, Zai, 2009. Educational Attainment of Migrant Children: the Forgotten Story of China's Urbanization, in *Education and Reform in China*, edited by Emily Hannum and Albert Park. London and New York: Routledge, pp117-130.

Cheng, Tiejun and Mark Selden, 1994. The origins and social consequences of China's Hukou system. *The China Quarterly* 139: 644-668.

Chiburis, R. C., 2010. "Score Tests of Normality In Bivariate Probit Models: Comment," Working Paper, University of Texas At Austin.

China Science Center of International Eurasian Academy of Science (CSCIEAS), China Association of Mayors, UN-Habitat, 2010. *The State of China's Cities, 2010/2011: Better City, Better Life*. Beijing: Foreign Language Press.

Coleman James, 1988. Social Capital in the Creation of Human Capital, *American Journal of Sociology*, Vol. 94, S95-S120.

Connelly, Rachel, Kenneth Roberts and Zhenzhen Zheng, 2007. Settlement of Rural Women Migrants in Urban China —Some of them are not "floating" anymore. Presented at the 4th international Conference on Population Geographies, Hong Kong, July 10-13.

Cox-Edwards, A., and M. Ureta. 2003. "International Migration, Remittances and Schooling: Evidence from El Salvador." *Journal of Development Economics*, 72(2): 429–61.

Crosnoe, Robert and Ruth N. López Turley, 2011. K–12 Educational Outcomes of Immigrant Youth. *The Future of Children*, 21(1): 129-152.

Curran, S.R. (1996), "Intra-Household Resource Exchange Relations: Explanations for Gender

Differentials in Education and Migration Outcomes in Thailand", Paper prepared for the Population Association Annual Meetings, New Orleans, LA., May 9-11, 1996.

Cutts, DB, Meyers AF, Black MM, Casey PH, Chilton M, Cook JT, Geppert J, Ettinger de Cuba S, Heeren T, Coleman S, Rose-Jacobs R, Frank DA, 2011. US Housing Insecurity and the Health of Very Young Children, *American Journal of Public Health.* 101(8):1508-14.

de Haan, Arjan 1999, 'Migration and Poverty in Africa: Is There a Link?', Background Paper for the 1999 World Bank SPA Status Report on Poverty.

Dreby, Joanna. 2010. *Divided by Borders: Mexican Migrants and Their Children*, Berkeley: University of California Press.

Duan, Chenrong and Lili Wu, 2009. "The Status quo of Rural Left Behind Children in China and its Analysis" *Journal of Chongqing Technology and Business University*, 26(1): 24-30 (in Chinese).

Edwards, Cox, A. and M. Ureta (2003): International migration, Remittances and Schooling: Evidence from El Salvador, *Journal of Development Economics*, 72, 2: 429-61.

Ellis, Frank, 2000, 'The Determinants of Rural Livelihood Diversification in Developing Countries', *Journal of Agricultural Economics*, Vol.51, No.2, pp.289-302.

Ellis, Frank, 1998, 'Survey Article: Household Strategies and Rural Livelihood Diversification', *The Journal of Development Studies*, Vol.35, No.1, pp.1-38

Evans, Gary W., and others, 1998. "Chronic Residential Crowding and Children's Well-being." *Child Development* 69, (no. 1514-1523).

Evans, Gary W., and others, 2000. "Housing Quality and Mental Health." *Journal of Consulting and Clinical Psychology* 68, (no. 3): 526-30.

Evans, Gary W., Susan Saegert, and Rebecca Harris, 2001. "Residential Density and
Psychological Health among Children in Low-Income Families." *Environment &
Behavior* 33, (no. 2): 165-80.

Fan, C. Cindy, 2008. *China on the Move: Migration, the State, and the Household*, London and
New York, NY: Routledge.

Gaetano, Arianne and Tamara Jacka, 2004 (ed.). *On the Move: Women in Rural-to-Urban
Migration in Contemporary China*, New York: Columbia University Press.

Garza, Rodolfo de la, 2010. Migration, Development And Children Left Behind: A
Multidimensional Perspective. UNICEF Social and Economic Policy Working Paper.

Ginther, D. K., & Pollak, R. A. (2004). Family structure and children's educational outcomes:
Blended families, stylized facts, and descriptive regressions. *Demography*, **41**, 671–696.

Gonzales, Nancy, Fairlee Fabrett, and George Knight, 2009 "Acculturation, Enculturation, and
the Psychological Adaptation of Latino Youth," in *Handbook of U.S. Latino Psychology*,
edited by Francisco A. Villarruel and others. Thousand Oaks, Calif.: Sage Publications.

Grasmuck, S. and P. Pessar. 1991, *Between Two Islands: Dominican International Migration*,
Berkeley: University of California Press.

Hanson, G. (2005): "*Emigration, Remittances, and Labor Force Participation in Mexico.*"
Mimeo. University of California, San Diego, CA.

Hanson, G. H. and C. Woodruff, C. 2003. "*Emigration and Educational Attainment in Mexico*."
Mimeo. University of California, San Diego, CA.

Han, Jialing, 2002. Education for Migrants' Children: A Case Study of Beijing (guanyu
liudong renkou de zinu jiaoyu wenti – yi Beijing weili), *Chinese Cadres' Forum*
(zhongguo dangzhen ganbu luntan), No. 7.

Han Jun (ed.), 2009. *Diaocha Zhongguo Nongcun (Surveying the Chinese Countryside),* Beijing: Zhongguo Fazhan Chubanshe, Vol 1, p. 451-452.

Harker, Lisa, 2006. Chance of a Lifetime: the Impact of Bad Housing on Children's Lives, accessed at

http://image.guardian.co.uk/sysfiles/Society/documents/2006/09/12/Lifechancereport.pdf on Oct. 10th, 2011.

Hannum, Emily, 2003. Poverty and Basic Education in Rural China: Villages, Households and Girls' and Boys' Enrollment. *Comparative Education Review*, 47 (2): 141-159.

Hannum, Emily, 2005. Evidence on Gender Stratification and Development, *Demography*, 42(2): 275-299

Hannum, Emily and Xie, Yu, 1994. Trends in Educational Gender Inquality in China: 1949-1985. *Research in Social Stratification and Mobility*, 13: 73-98.

Hayard, M.D. and Gorman, B. K. 2004. The Arm of Childhood: the Influence of Early Life Social Conditions on Men's Mortality. *Demography*, 41: 87-107.

Heckman, James, 2006. Skill Formation and the Economics of Investing in Disadvantaged Children, *Science*, Vol. 312 no. 5782 pp. 1900-1902

Hernandez, Donald J., Suzanne Macartney, and Victoria L. Blanchard. 2009. Children in Immigrant Families in Eight Affluent Countries: Their Family, National, and International Context, Florence, Italy: UNICEF Innocenti Research Centre.

Hernandez, Donald J. (ed.), 1999. *Children of Immigrants: Health, Adjustment, and Public Assistance,* Washington, DC: National Academy Press

Hernandez, Donald J. and Evan Charney (eds.), 1998, *From Generation to Generation: The Health and Well-Being of Children in Immigrant Families*, Washington, DC: National Academy Press

Heymann, Jody and others, 2009. "The Impact of Migration on the Well-Being of Transnational Families: New

Data from Sending Communities in Mexico," *Community, Work and Family* 12, no. 1: 91–103.

Hicks-Coolick, A., P. Burnside-Eaton, and A. Peters, 2003. "Homeless Children: Needs and Services."*Child and Youth Care Forum* 32, (no. 4): 197-210.

Hildebrandt, Nicole and David McKenzie, 2005. The Effects of Migration on Child Health in Mexico, *Economia*, Vol. 6 No. 1: 257-289.

Horizon Survey Company, State Statistical Bureau and Survey System of China Entrepreneurs, 1997. *Observing China*. Beijing: Agriculture and Commerce Press.

Huang, Youqin and Ran Tao, 2015. Housing Migrants in Chinese Cities: Current Status and Policy Design, *Environment and Planning C*, No. 4.

Hulchanski, J. David. 1995. The concept of housing affordability: Six contemporary uses of the housing expenditure-to-income ratio. *Housing Studies*, 10 (4).

Jacka, Tamara, 2006. *Rural Women in Urban China: Gender, Migration and Social Change,* New York: M.E. Sharpe.

Jampaklay, A. 2006. 'Parental Absence of Children's School Enrollment: Evidence from a Longitudinal Study in Kanchanaburi, Thailand', *Asian Population Studies,* 2(1):93-110.

Johnson, Ian, 2013. *China's Great Uprooting: Moving 250 Million into Cities*. The New York Times, June 15. Accessed at http://www.nytimes.com/2013/06/16/world/asia/chinas-

great-uprooting-moving-250-million-into-cities.html?pagewanted=all&_r=0

Kabeer, Naila, 1994. Reversed Realities: gender Hierarchies in Development Thought. Verso.

Kanaiaupuni, S. and K. Donato 1999 "Migradollars and mortality: The effects of male migration
on infant mortality in Mexico", *Demography*, 363: 339-353.

Kandel, W., & Kao, G. (2001). The impact of temporary labor migration on Mexican children's
educational aspirations and performance. *International Migration Review*, **35**, 1205–1231.

Kandel, W., 2003, "The Impact of U.S. Migration on Mexican Children's Educational
Attainment", in M. Cosio, R. Marcoux, M. Pilon and A. Quesnel (eds.) Education,
Family and Population Dynamics, CICRED, Paris, pp. 305-328.

Kasinitz, Philip, 2001. Invisible No More? West Indian Americans in the Social Scientific
Imagination. In *Islands in the City: West Indian Migration to New York*, edited by Nancy
Foner. Berkeley: University of California Press.

Kasinitz, Philip, Mary C. Waters, John H. Mollenkopf and Jennifer Holdaway. 2009. *Inheriting
the City: The Children of Immigrants Come of Age*. New York: Russell Sage Foundation.

Karol, Lynn A. y and Gabriella C. Gonzalez, 2011. Early Care and Education for Children in
Immigrant Families, *The Future of Children*, 21(1): 71-102

Kieman, K. E. (1992). The impact of family disruption in childhood on transitions made in
young adult life. *Population Studies*, **46**, 213–234.

Ko, Linda and Krista Perreira, "It Turned My World Upside Down: Latino Youth's Perspectives
on Immigration," *Journal of Adolescent Research* 25, no. 3 (2010): 465–93.

Kutty, N. K. 2005. A new measure of housing affordability: Estimates and analytical results.
Housing Policy Debate 16 (1):113-142.

Lang, K. and J.L. Zagorsky, 2001, "Does Growing Up With a Parent Absent Really Hurt?"

Journal of Human Resources, Vol. 36, No. 2, spring.

Landale, Nancy S., Kevin J. A. Thomas, and Jennifer Van Hook, 2011. "The Living
Arrangements of Children of Immigrants. *The Future of Children*, 21(1): 43-70.

Lee, Leng and Albert Park, 2010. "Parental Migration and Child Development in China",
working paper, Gansu Survey of Children and Families.

Levitt, Peggy, 1998. Social remittances: migration driven local-level forms of cultural diffusion.
International Migration Review, 32(4):926-48

Liang, Zai and Chen, Yiu Por., 2007. The Educational Consequences of Migration for Children
in China. *Social Science Research*, 36(1): 28-47.

Liang, Zai, Lin Guo and Charles Chengrong Duan, 2008. "Migration and the Well-being of
Children in China." *Yale China Health Journal*. Vol. 5: 25-46.

Lee, Ming-Hsuan, 2011. "Migration and Children's Welfare in China: The Schooling and health
of Left Behind Children", *The Journal of Developing Areas*, 44(2): 165-182.

Lloyd, C.B. and A.K. Blanc (1996) 'Children's Schooling in Sub-Saharan Africa: The Role of
Fathers, Mothers and Others', *Population and Development Review*, 22: 265-298.

Long, Scott, 1997. *Regression Models for Categorical and Limited Dependent Variables*,
Thousand Oaks, London: SAGE Publications.

Lu, S. and Zhang, S. 2001. Education of Migrant Children: Report from Survey of Migrant
Schools in Beijing, *Strategy and Management*, 4: 95-108.

Mckenzie, D.J., 2005, "Beyond Remittances: The Effects of Migration on Mexican Households",
forthcoming in SCHIFF, M. and Ç. ÖZDEN (eds.), *International Migration, Remittances,
and the Brain Drain*, World Bank, Washington, D.C. Theory and Evidence from
Mexico", BREAD Working Paper No. 063.

Mckenzie, D.J. and H. Rapoport, 2004. *Network Effects and the Dynamics of Migration and Inequality: Theory and Evidence from Mexico*, working paper 063. Cambridge, Mass: Bureau for Research in Economic analysis of Development.

Mckenzie, D.J. and H. Rapoport, 2005, "Migration Networks, Migration Incentives and Education Inequality in Rural Mexico", Paper presented at the Inter-American Development Bank "Economic Integration, Remittances and Development" Conference.

Mckenzie, D.J. and H. Rapoport, 2006. Can Migration reduce Education Attainment? Evidence from Mexico. Working paper for Child Migration Research Network (WPS3952). http://www.childmigration.net/files/Rapoport_06.pdf

McLanahan, S., & Sandefur, G. (1994). Growing *up with a single parent: What hurts, what helps?* Cambridge, MA: Harvard University Press.

Ministry of Housing and Urban-rural Development (MOHURD), 2009. *A Notice about Cheap Rental Housing Plan for 2009-2011,* No. 91

Minister of Agriculture, 2010. *Nongye buzhang tan jianjue nongminggong wenti silu: zhuanjing jianjue qige wenti (The Minister of Agriculture Talks about the Framework to Solve Migrants' Problems: Urgently Solve Seven Problems),* access at http://news.sina.com.cn/c/2010-10-13/143721267624.shtml.

MOHURD, 2007, No. 256. *Guanyu gaishan nongmingong juzh tiaojian de zhidao yijian (Suggestions about How to Improve Migrants' Living Condition),* http://www.mohurd.gov.cn.

MOHURD, 2010, No. 87. *Guanyu jiakuai fazhan gonggong zulin zhufang de zhidao yijian (Suggestions for Accelerating the Development of Public Rental Housing),*

http://www.mohurd.gov.cn/zcfg/jswj/zfbzwj/201006/t20100612_201308.htm, accessed on 16 June, 2010.

Murphy, Rachel, 2002. *How Migrant Labor is Changing Rural China*，New York：Cambridge University Press

Murphy, Rachel, 2004 "The Impacts of Labor Migration on the Well-being and Agency of Rural Chinese Women: cultural and Economic Contexts and the Life Course". In *On The Move: Women in Rural-to-Urban Migration in Contemporary China*, Edited by Arianne M. Gateano and Tamara Jacka, Columbia University Press, New York.

National Bureau of Statistics of China (NBSC), 2008. 2008 Nianmo Quanguo Nongmingong Zongliang Wei 22542 Wan Ren (The National Total of Migrant Workers at the end 2008 was 225.42 million)', 25 March 2009, http://www.stats.gov.cn/tjfx/fxbg/t20090325_402547406.htm.)

NBSC, 2010. *China Statistical Yearbook 2010*. Beijing: China Statistics Press.

NBSC, 2011. Press Release on Major Figures of the 2010 National Population Census, accessed at http://www.stats.gov.cn/was40/gjtjj_en_detail.jsp?searchword=census&channelid=9528&record=6

OECD 2006 "Effects Of Migration On Sending Countries: What Do We Know?" *OECD Development Centre Working Paper* No. 250, 2006.

Office of Migrant Service and Management (OMSM) in National Population and Family Planning Commission (ed.), 2010. *Zhongguo liudong renkou fazhan baogao 2010 (A Report on Migrants' Development in China, 2010)*. Beijing: China Population Press.

Palloni, A., 2006. Reproducing Inequalities: Luck, Wallets and the Enduring Effects of

      Childhood Health. *Demography*, 43:587-615.

Parreñas, Rhacel. 2005. *Children of Global Migration: Transnational Families and Gendered*

      Woes. Stanford, CA: Stanford University Press.

Perreira, Krista M. and India J. Ornelas, 2011. The Physical and Psychological Well-Being of

      Immigrant Children, *The Future of Children*, 21(1): 195-218.

Portes, Alejandro, and Min Zhou, 1993. The New Second Generation: Segmented Assimilation

      and Its Variants, *Annals of the American Academy of Political and Social Science*. 530:

      74-96.

Portes, A. 1995. Children of immigrants: Segmented assimilation and its determinants. Pp. 248-

      279 in *The Economic Sociology of Immigration: Essays on Networks, Ethnicity, and*

      Entrepreneurship, A. Portes, ed. New York: Russell Sage Foundation.

Portes, A. 1996 *The New Second Generation*. New York: Russell Sage Foundation.

Portes, A., and D. MacLeod. 1996 Educational progress of children of immigrants: The roles of

      class, ethnicity, and school context. *Sociology of Education*, 69:255-275.

Portes, Alejandro and Rubén G. Rumbaut, 2005. *Legacies: The Story of the Immigrant Second*

      Generation. Los Angeles: University of California Press.

Qiu, Jack Linchuan. 2009. *Working-class Network Society: Communication Technology and the*

      Information Have-less in Urban China. Cambridge: MIT.

Rosenbaum, Emily and Samantha Friedman, 2001. Differences in the Locational Attainment of

      Immigrant and Native Born Households with Children in New York City, *Demography,*

      38: 337-48.

Rosenbaum, Emily and Samantha Friedman, 2006. *The Housing Divide: How Generations of Immigrants Fare in New York's Housing Market*. New York: NYU Press.

Ross, Heidi and Jing Lin, 2003. Social Capital and Chinese School Communities. Unpublished manuscript, Colgate University, Hamilton, NY.

Salah, Mohamed Azzedine, 2008. The Impacts of Migration on Children In Moldova. *UNICEF Division of Policy and Practice Working Paper*.

Schoon, Ingrid, 2006. *Risk and Resilience: Adaptions in Changing Times*, Cambridge: Cambridge University Press.

Sawyer, Richard J. and Howard Dubowitz, 1994. "School Performance of Children in Kinship Care", *Child Abuse and Neglect* 18: 587-597.

Sluzki, Carlos, 1979 "Migration and Family Conflict," *Family Process* 18 no. 4: 379–90.

Solinger, Dorothy, 1999. *Contesting Citizenship in Urban China: Peasant Migrants, the State, and the Logic of the Market*, Los Angeles: University of California Press.

State Council, 2006, No. 5. *Guowuyuan guanyu jianjue nongminggong wenti de ruogan yijian (Suggestions from State Council about Solving Problems related to Migrant Workers)*.

State Council, 2007. *Suggestions regarding Solving Urban Low-income Household's Housing Problems*, No. 24. (Guowuyuan guanyu jianjue dishouru jiating zhufang kunnan de ruogan yijian).

Solomon, Jennifer C. and Jonathan Marx, 1995. "To Grandmother's House We Go: Health and School Adjustment of Children raised Solely by Grandparents", *Gerontologist* 35: 386-394.

Song, Lijun and Nan Lin, 2009. Social Capital and Health Inequality: Evidence from Taiwan, *Journal of Health and Social Behavior*, Vol. 50: 149-163.

South, Scott J., and Dana L. Haynie, 2004. "Friendship Networks of Mobile Adolescents." *Social Forces* 83, (no. 1): 315-50.

South, Scott J., Dana L. Haynie, and Sunita Bose, 2005. "Residential Mobility and the Onset of Adolescent Sexual Activity," *Journal of Marriage and Family* 67, (no. May 2005) : 499-514.

Tao, Ran, Dehua Kong, and Guangzhong Cao, 2011. Liudong haishi liushou: zhongguo nongcun liudong renkou zinv jiuxue di xuanze yu yingxiang yinsu kaozha (Migrate or Left Behind: Choosing Place of Education for Children of Rural Migrants), *Zhongguo nongcu jingji (Chinese Rural Economy)*, 6: 37-44.

Tao, Ran and Wang, Hui, 2010. Zhongguo shangwei wan zhi zhuanxing zhong de tudi zhidu gaige: tiaozhao yu chulu (Incomplete and Transitional Land Reform in China: Challenges and Solutions), *Guoji jingji pinglun (International Economic Review)*, 85(2): pp 93-123.

Tao, Ran, 2007, "Hukou Reforms and Social Security for Migrants in China", Commissioned Policy Paper by the International Organization for Migration (IOM) based in Geneva. It will also appear as a contributed chapter in a book on "Migration Policy in China", edited by Dr Frank Laczko (IOM) and Rachel Murphy (Bristol), Routledge

Tao, Ran and Xu Zhigang, 2007 "Urbanization, Rural Land System and Social Security for Migrant Farmers in China", Journal of Development Studies. VIDAL, J-P. (1998), "The Effect of Emigration on Human Capital Formation", *Journal of Population Economics*, Vol. 11, pp.589-600

Taylor, Edward and Scott Rozelle, 2003. Migration and Incomes in Source Communities: A New Economics of Migration Perspective from China. *Economic Development and Cultural Change*, 52(1):75-102

Vandivere, Sharon, Elizabeth C. Hair, Christina Theokas, Kevin Cleveland, Michelle McNamara, and Astrid Atienza, 2006. How Housing Affects Child Well-Being, accessed at www.fundersnetwork.org on Oct. 10, 2011

Wan, Meng, 2009. "Statistical Analysis of Survey of Left-behind Children in Rural Areas in Jiangxi Province", *Technological Forum,* 6: 31-33 (in Chinese).

Wang, Ya Ping, Yanglin Wang and Jiansheng Wu, 2010. Housing Migrant Workers in Rapidly Urbanizing Regions: A Study of the Chinese Model in Shenzhen. *Housing Studies*, 25(1): 83-100.

Wen, Ming and DanhuaLin, 2012. "Child Development in Rural China: Children Left Behind by their Migrant Parents and Children of Nonmigrant Families", *Child Development*, 83(1): 120-136.

Whitehead, Ann, and Iman Hashim. 2005. "Children and Migration." Background Paper for DFID Migration Team.

Winship, Christopher and Stephen Morgan, 1999. The Estimation of Causal Effects from Observational Data, *Annual Review of Sociology*, 25: 659-706.

Wooldridge, Jeffrey M, 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, Mass.: MIT Press.

World Bank. 2006. The Development Impact of Workers' Remittances in Latin America – Volume II, detailed findings. *Economic Report* No. 37026, Washington.

Wu, Weiping, 2006. Migrant Housing in Urban China: Choices and Constraints, *Urban Affairs Review*, Vol. 38, No. 1: 90-119.

Xiang, Biao 2007. How Far Left Behind are the left behind? A Preliminary Study in rural China, *Population, Place and Space*, 13(3): 179-191.

Yang, Dean, 2004. "International Migration, Human Capital, and Entrepreneurship: Evidence from Philippine Migrants' Exchange Rate Shocks", Mimeo. Ford School of Public Policy, University of Michigan.

Yao, Bianfang and Ya Shi, 2009. "Analyses on the Management Policy of Left-behind Children Education", *Education and Teaching Research*, 23: 18-22 (in Chinese).

Zeng, Siqi, Fengjie Long, C. Cindy Fan and Yizhen Gu, 2009. Urban Villages in China: A 2008 Survey of Migrant Settlement in Beijing, *Eurasian Geography and Economics*, 50 (4): 425-446.

Zhang, Li, 2001. *Strangers in the City: Reconfigurations of Space, Power, and Social Networks within China's Floating Population*. Stanford: Stanford University Press.

Zeng, Zhen and Yu Xie, 2014. The Effects of Grandparents on Children's Schooling: Evidence From Rural China, *Demography*, 51(2): 599-617

Zhou, Minhui, Rachel Murphy and Ran Tao, 2014. "Effects of Parents' Migration on the Education of Children Left Behind in Rural China", *Population and Development Review*, 40(2): 173-192.

Zhou, Min, 1997. Growing up American: the Challenge Confronting Immigrant Children and Children of Immigrants. *Annual Review of Sociology* 23: 63-95.

Ziol-Guest, K. and Mckenna, C. 2014. "Early Childhood Residential Instability and School Readiness." *Child Development* 85:103-113.
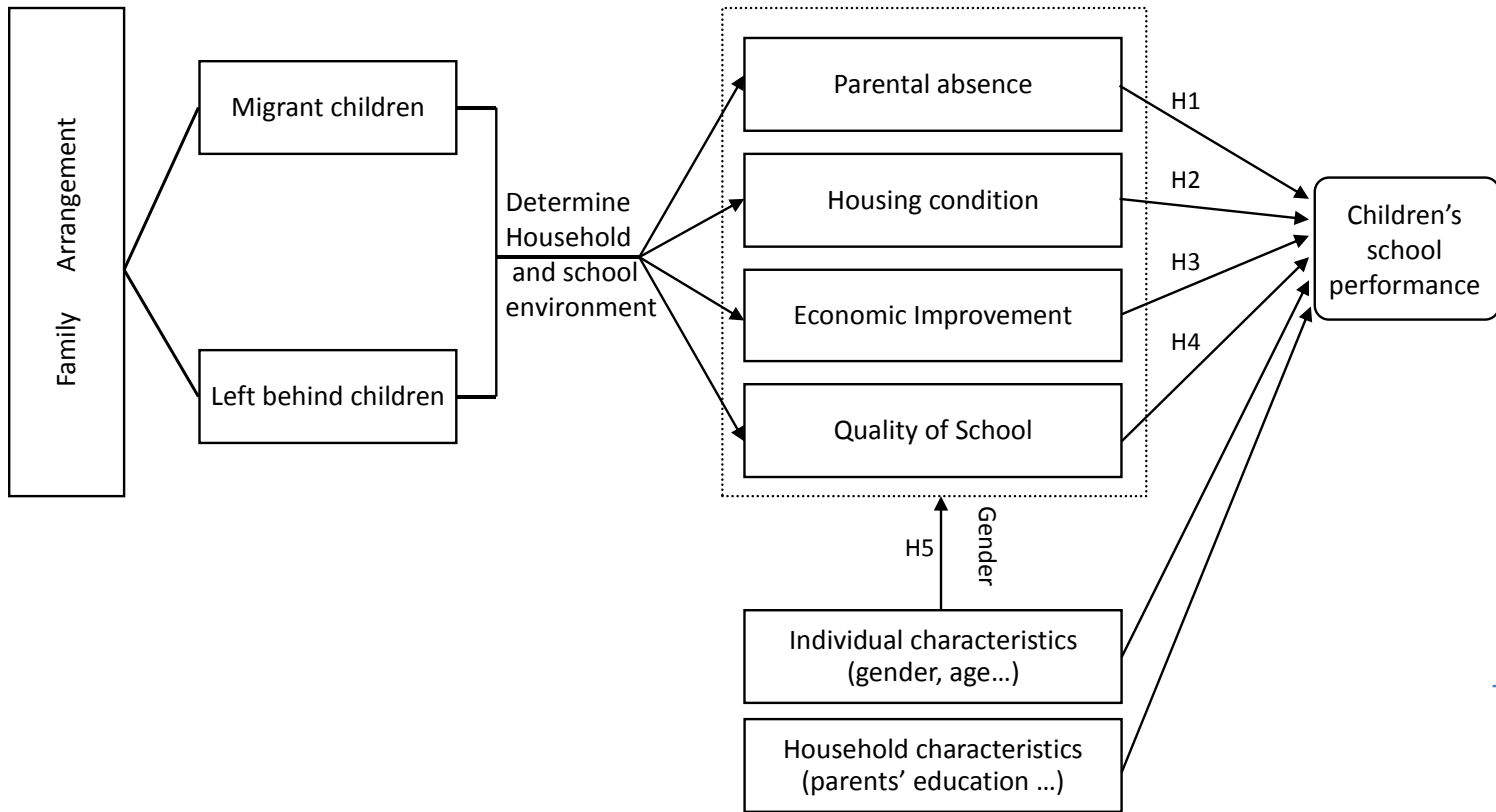
Figure 1 The Conceptual Framework

Table 1 Family Arrangement among Migrant Workers

Family Arrangement	Number	%
Migrant children		**45.70**
Migrant children living with both parents	277	43.35
Migrant children living with one parent only*	15	2.35
Left behind children		**54.30**
Left behind children living with mother only	56	8.76
Left behind children living with father only	18	2.82
Left behind children with no parents present, living with grandparents	188	29.42
Left behind children with no parents present, living with others	85	13.30
Total	**639**	**100.00**

Note: Migrant children living with mother only and those living with father only are combined
due to small number.

Table 2 Academic Performance by Family Arrangement

Chinese (%)	All migrant children	Migrant children with both parents	Migrant children with one parent	All left behind children		Left behind children with mother only	Left behind children with father only	Left behind children with grandparents	Left behind children with others	Total
				Family Arrangement						
Poor	**1.53**	1.61	0	**4.04**	+	2.08	5.56	4.26	4.41	**2.74**
Lower medium	**9.54**	9.64	7.69	**10.56**		12.5	5.56	7.98	17.65	**10.12**
Medium	**45.80**	46.18	38.46	**38.20**	+	37.5	44.44	38.3	36.76	**41.68**
Upper medium	**28.63**	28.11	38.46	**28.57**		29.17	27.78	30.85	22.06	**28.64**
Very good	**14.50**	14.46	15.38	**18.63**		18.75	16.67	18.62	19.12	**16.81**
Total %	**100**	100	100	**0.00**		100	100	100	100	**100**
Total N	**262**	249	13	**322**		48	18	188	68	**583**
Math (%)										
Poor	**1.53**	1.61	0	**4.04**	+	4.17	5.56	3.19	5.88	**2.74**
Lower medium	**12.60**	12.85	7.69	**10.56**		12.5	5.56	7.45	19.12	**11.49**
Medium	**41.22**	41.37	38.46	**32.30**	*	27.08	33.33	35.11	27.94	**36.36**
Upper medium	**29.01**	28.51	38.46	**30.43**		29.17	27.78	31.91	27.94	**29.85**
Very good	**15.65**	15.66	15.38	**22.67**	*	27.08	27.78	22.34	19.12	**19.55**
Total %	**100**	100	100	**100**		100	100	100	100	**100**
Total N	**262**	249	13	**322**		48	18	188	68	**583**

Table 3 Academic Performance by Gender of Children

%		Gender of Children		
		Girls	**Boys**	
Chinese	Poor	2.67	3.1	*
	Lower medium	8.78	11.15	*
	Medium	44.27	39.01	+
	Upper medium	27.86	29.72	*
	Very good	16.41	17.03	*
	Total	100	100	
Math	Poor	2.67	3.1	*
	Lower medium	8.78	13.62	
	Medium	38.55	34.67	
	Upper medium	30.15	29.41	
	Very good	19.85	19.2	
	Total	100	100	
N		246	340	

Table 4 Summary Statistics for Independent Variables (all children)

	Mean	St. Dev	Median	%
Individual Characteristics				
Gender of Children: Boys				58.85
Age of Children	10.47	2.87	10	
Family Arrangement (see Table 2)				
Household Characteristics				
Mother's Education	6.36	3.14	6	
Father's Education	7.57	2.89	8	
Number of Siblings	0.50	0.56	0	
Nonagricultural wage income in 2008	39,761	40,747	33,180	
Migrants' number of moves in cities	2.20	3.36	2.00	
Migrants' duration of stay in cities	7.77	5.25	6.00	
Children's live space (m^2 per capita)				
Contextual Variables				
School Type				
Urban Public Schools				31.85
Urban Private Schools				13.69
Rural Public Schools				54.46
Urban schools require fees for migrant children (yes=1)				89.08

Table 5 Ordered Logistic Regression on Chinese (Coefficients): All Children

	Model 1		Model 2		Model 3	
Family Arrangement (Ref.= Left behind children)						
Migrant Children	0.089		11.240	***	0.083	
Individual Characteristics						
Gender of Children (Ref.=Girls)	-0.747	***	-0.982	***	-4.942	+
Age of Children	0.012		0.006		0.015	
Household Characteristics						
Mother's Education	0.057	+	0.061	*	0.054	+
Father's Education	0.040		0.036		0.040	
Number of Siblings	0.183		0.141		0.165	
Nonagricultural wage income in 2008 (in log form)	0.084		0.679	**	-0.127	
Number of moves in cities	0.039		0.044		0.104	*
Duration of stay in the cities	0.022		0.022		0.009	
Children's Living Space	-0.001		-3.1E-04		-3.6E-04	
Contextual Variables						
School Type (Ref=Other Schools)						
Public Schools	0.513	+	0.600	*	0.556	+
Urban Migrant Schools	-0.113		-0.057		-0.070	
Urban schools require fees for migrant children (yes=1)	-0.135		-0.205		-0.138	
Interactions:						
Migrant Children × Boys			0.448			
Migrant Children × Nonagricultural wage income in 2008			-1.110	***		
Migrant Children × Children's Living Space			0.015			
Boys × Nonagricultural wage income in 2008					0.409	
Boys × Number of moves in cities					-0.089	
Boys × Duration of Stay in the cities					0.023	
Boys × Children's Living Space					-0.001	
Intercept 1	-1.736		4.204	+	4.204	+
Intercept 2	-0.103		5.862	**	5.862	**
Intercept 3	2.091		8.106	***	8.106	***
Intercept 4	3.597	*	9.655	***	9.655	***
Number of Cases	579		579		579	
Prob > F	0.000		0.000		0.000	

Note: + significant at 0.1 level; * 0.05 level; ** 0.01 level; *** 0.001 level

Table 6 Ordered Logistic Regression on Chinese (Coefficients): Migrant Children

	Model 1		Model 2		Model 3	
Family Arrangement (Ref.=Migrant with two parents)						
Migrant children with one parent only	0.318		9.881	*	1.867	***
Individual Characteristics						
Gender of Children (Ref.=Girls)	-0.521	*	-0.454	+	-4.925	
Age of Children	-0.022		-0.027		-0.041	
Household Characteristics						
Mother's Education	0.037		0.041		0.017	
Father's Education	0.092	*	0.087	+	0.097	*
Number of Siblings	0.698	**	0.675	**	0.714	**
Nonagricultural wage income in 2008 (in log form)	-0.396	+	-0.328		-0.555	+
Number of moves in cities	0.074		0.069		0.138	
Duration of Stay in the cities	-0.020		-0.014		-0.002	
Children's Living Space	0.017		0.018		0.031	*
Contextual Variables						
School Type (Ref=Other Schools)						
Urban Public Schools	0.704	*	0.820	**	0.903	**
Migrant Schools	-0.001		0.090		0.106	
Urban schools require fees for migrant children (yes=1)	-0.399		-0.480		-0.515	
Interactions:						
Migrant Children with One Parent Only × Nonagricultural wage income in 2008			-1.010	*		
Migrant Children with One Parent Only × Children's Living Space			0.035			
Boys × Number of moves in cities					-0.101	
Boys × Duration of Stay in the cities					-0.018	
Boys × Nonagricultural wage income in 2008					0.501	
Boys × Migrant Children with One Parent Only					-3.009	***
Boys × Children's Living Space					-0.024	
Intercept 1	-7.427	**	-6.731	**	-8.817	**
Intercept 2	-5.328	*	-4.607	*	-6.709	*
Intercept 3	-2.782		-2.040		-4.104	
Intercept 4	-1.086		-0.327		-2.323	
Number of Cases	259		259		259	
Prob > F	0.000		0.000		0.000	

Note: + significant at 0.1 level; * 0.05 level; ** 0.01 level; *** 0.001 level

Table 7 Ordered Logistic Regression on Chinese (Coefficients): Left-Behind Children

	Model 1		Model 2		Model 3	
Family Arrangement (Ref.=left behind with others)						
Left-Behind with Mother	0.309		7.895		0.318	
Left-Behind with Grandparents	0.091		14.024	**	0.092	
Individual Characteristics						
Gender of Children (Ref.=Girls)	-0.986	***	-1.197	**	-3.266	
Age of Children	0.038		0.036		0.040	
Household Characteristics						
Mother's Education	0.091	*	0.096	*	0.091	*
Father's Education	-0.024		-0.015		-0.021	
Number of Siblings	-0.183		-0.280		-0.179	
Nonagricultural wage income in 2008 (in log form)	0.657	**	1.341	***	0.541	+
Duration of Stay in the cities	0.054	*	0.059	*	0.044	
Children's Living Space	-2.6E-04		1.8E-04		-2.4E-04	
Interactions:						
Left-Behind with Mother × Boys			-0.435			
Left-Behind with Grandparents × Boys			0.506			
Left-Behind with Mother × Nonagricultural wage income in 2008			-0.715			
Left-Behind with Grandparents × Nonagricultural wage income in 2008			-1.359	**		
Left-Behind with Mother × Children's Living Space			0.001			
Left-Behind with Grandparents × Children's Living Space			-0.001			
Boys × Nonagricultural wage income in 2008					0.208	
Boys × Duration of Stay in the cities					0.018	
Boys × Children's Living Space					0.000	
Intercept 1	4.050	+	10.970	**	2.798	
Intercept 2	5.530	**	12.506	***	4.287	
Intercept 3	7.602	***	14.643	***	6.370	*
Intercept 4	9.109	***	16.176	***	7.873	*
Number of Cases	320		320		320	
Prob > F	0.000		0.000		0.000	

Note: + significant at 0.1 level; * 0.05 level; ** 0.01 level; *** 0.001 level

Table 8 Logistic Regression on Awards (Coefficients): All Children

	Model 1		Model 2		Model 3	
Family Arrangement (Ref.= Left behind children)						
Migrant Children	0.302		1.139		0.273	
Individual Characteristics						
Gender of Children (Ref.=Girls)	-0.116		-0.403	+	-2.521	
Age of Children	0.070	*	0.069	*	0.077	*
Household Characteristics						
Mother's Education	0.092	*	0.089	*	0.086	*
Father's Education	0.026		0.034		0.030	
Number of Siblings	0.042		0.040		0.023	
Nonagricultural wage income in 2008 (in log form)	0.212		0.262		0.113	
Number of moves in cities	0.039		0.041		0.232	**
Duration of stay in the cities	0.038	+	0.038	+	-0.019	
Children's Living Space	0.002		0.002		0.003	
Contextual Variables						
School Type (Ref=Other Schools)						
Public Schools	0.769	+	0.787	+	0.809	+
Urban Migrant Schools	0.456		0.504		0.531	
Urban schools require fees for migrant children (yes=1)	-0.159		-0.179		-0.185	
Interactions:						
Migrant Children × Boys			0.670	+		
Migrant Children × Nonagricultural wage income in 2008			-0.135			
Migrant Children × Children's Living Space			0.015			
Boys × Nonagricultural wage income in 2008					0.229	
Boys × Number of moves in cities					-0.261	**
Boys × Duration of Stay in the cities					0.090	*
Boys × Children's Living Space					-0.003	
Intercept	-4.750	**	-5.139	*	-3.814	+
Number of Cases	579.000		579.000		579.000	
Prob > F	0.002		0.001		0.000	

Note: + significant at 0.1 level; * 0.05 level; ** 0.01 level; *** 0.001 level

Table 9 Logistic Regression on Awards (Coefficients): Migrant Children

|	Model 1		Model 2		Model 3	
Family Arrangement (Ref.=Migrant with two parents)						
Migrant children with one parent only	0.363		6.855		1.775	+
Individual Characteristics						
Gender of Children (Ref.=Girls)	0.266		0.302		-0.830	
Age of Children	0.115	*	0.109	*	0.113	*
Household Characteristics						
Mother's Education	0.145	**	0.149	**	0.140	*
Father's Education	0.022		0.016		0.022	
Number of Siblings	0.086		0.080		0.072	
Nonagricultural wage income in 2008 (in log form)	0.070		0.128		0.068	
Number of moves in cities	0.130	+	0.132		0.187	
Duration of Stay in the cities	0.003		0.004		-0.009	
Children's Living Space	0.016		0.019		0.034	
Contextual Variables						
School Type (Ref=Other Schools)						
Urban Public Schools	0.770	+	0.777	+	0.913	+
Migrant Schools	0.522		0.508		0.590	
Urban schools require fees for migrant children (yes=1)	-0.404		-0.421		-0.451	
Interactions:						
Migrant Children with One Parent Only × Nonagricultural wage income in 2008			-0.590			
Migrant Children with One Parent Only × Children's Living Space			-0.016			
Boys × Number of moves in cities					-0.067	
Boys × Duration of Stay in the cities					0.026	
Boys × Nonagricultural wage income in 2008					0.143	
Boys × Migrant Children with One Parent Only					-2.329	+
Boys × Children's Living Space					-0.031	
Intercept	-3.854		-4.436		-4.164	
Number of Cases	259		259		259	
Prob > F	0.015		0.041		0.038	

Note: + significant at 0.1 level; * 0.05 level; ** 0.01 level; *** 0.001 level

Table 10 Logistic Regression on Awards (Coefficients): Left-Behind Children

	Model 1		Model 2		Model 3	
Family Arrangement (Ref.=left behind with others)						
Left-Behind with Mother	0.863	+	12.070	+	0.916	+
Left-Behind with Grandparents	-0.014		7.361		-0.001	
Individual Characteristics						
Gender of Children (Ref.=Girls)	-0.443	+	-0.320		-5.255	
Age of Children	0.047		0.060		0.051	
Household Characteristics						
Mother's Education	0.052		0.068		0.046	
Father's Education	0.039		0.040		0.046	
Number of Siblings	0.124		0.076		0.127	
Nonagricultural wage income in 2008 (in log form)	0.382	+	0.872	*	0.153	
Duration of Stay in the cities	0.056	*	0.058	*	0.026	
Children's Living Space	0.001		0.004		0.002	
Interactions:						
Left-Behind with Mother × Boys			-0.255			
Left-Behind with Grandparents × Boys			-0.108			
Left-Behind with Mother × Nonagricultural wage income in 2008			-0.975			
Left-Behind with Grandparents × Nonagricultural wage income in 2008			-0.678			
Left-Behind with Mother × Children's Living Space			-0.010	+		
Left-Behind with Grandparents × Children's Living Space			-0.003			
Boys × Nonagricultural wage income in 2008					0.443	
Boys × Duration of Stay in the cities					0.052	
Boys × Children's Living Space					-0.002	
Intercept	-5.439	*	-11.077	*	-3.036	
Number of Cases	320		320		320	
Prob > F	0.040		0.187		0.113	

Note: + significant at 0.1 level; * 0.05 level; ** 0.01 level; *** 0.001 level

Appendix F.1 Sample Sites for 12-city Migrant Survey in 2009
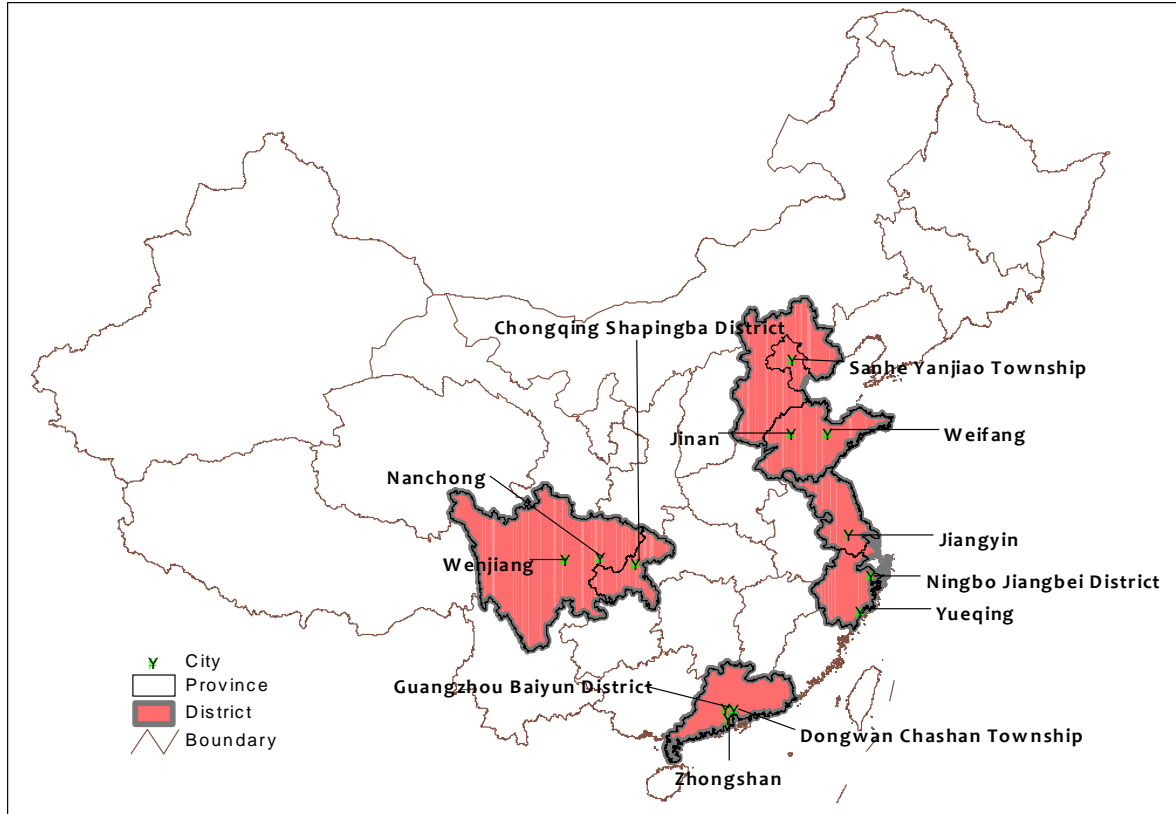
Appendix T.1 Results for Endogeneity Test on Instrumental Variables (IVs)

	IV1: Presence of grandparents in hometown	IV2: Migrant parents' intention to stay in the city	IV3: Number of relatives and friends in the city
Family Arrangement (migrant children vs. left behind)			
F-test (w/ children's migration status)	7.10	16.53	0.62
2SLS diagnostics (using Chinese as an example)	P value		
Exogeneity Test (Sargan N*R-sq test)	0.618		
Endogeneity Test (Durbin-Wu-Hausman test)	0.172		
2SLS Diagnostics (ref: left-behind children living with others)			
Exogeneity Test (Sargan N*R-sq test)	P value	NA	
Migrant Children with both Parents	0.271		
Migrant Children with one Parent	0.608		
Left-Behind Children with Father	0.539		
Left-Behind Children with Mother	0.757		
Left-Behind Children with Grandparents	0.505		
Endogeneity Test (Durbin-Wu-Hausman test)	P value		
Migrant Children with both Parents	0.422		
Migrant Children with one Parent	0.602		
Left-Behind Children with Father	0.732		
Left-Behind Children with Mother	0.583		
Left-Behind Children with Grandparents	0.567		

Appendix T2.1 Ordered Logistic Regression on Math (Coefficients): All Children

	Model 1		Model 2		Model 3	
Family Arrangement (Ref.= Left behind children)						
Migrant Children	0.004		5.160		0.011	
Individual Characteristics						
Gender of Children (Ref.=Girls)	-0.180		-0.371	+	-2.173	
Age of Children	-0.001		-0.005		0.000	
Household Characteristics						
Mother's Education	0.030		0.031		0.029	
Father's Education	0.041		0.041		0.041	
Number of Siblings	-0.063		-0.076		-0.067	
Nonagricultural wage income in 2008 (in log form)	0.147		0.422	+	0.063	
Number of moves in cities	-0.009		-0.007		0.055	
Duration of stay in the cities	0.025		0.025		0.007	
Children's Living Space	2.5E-04		3.2E-04		8.0E-05	
Contextual Variables						
School Type (Ref=Other Schools)						
Public Schools	0.914	**	0.955	**	0.924	**
Urban Migrant Schools	0.282		0.323		0.295	
Urban schools require fees for migrant children (yes=1)	0.256		0.232		0.265	
Interactions:						
Migrant Children × Boys		+	0.391			
Migrant Children × Nonagricultural wage income in 2008			-0.527	+		
Migrant Children × Children's Living Space			0.010			
Boys × Nonagricultural wage income in 2008					0.188	
Boys × Number of moves in cities					-0.099	
Boys × Duration of Stay in the cities					0.029	
Boys × Children's Living Space					4.7E-04	
Intercept 1	-0.469		2.246		-1.345	
Intercept 2	1.258	+	3.977	+	0.389	
Intercept 3	3.120		5.846	*	2.256	
Intercept 4	4.569		7.309	**	3.708	+
Number of Cases	579		579		579	
Prob > F	0.01		0.01		0.02	

Note: + significant at 0.1 level; * 0.05 level; ** 0.01 level; *** 0.001 level

Appendix T2.2 Ordered Logistic Regression on Math (Coefficients): Migrant Children

	Model 1		Model 2		Model 3	
Family Arrangement (Ref.=Migrant with two parents)						
Migrant children with one parent only	0.332		15.504	***	2.156	***
Individual Characteristics						
Gender of Children (Ref.=Girls)	0.046		0.158		-4.887	
Age of Children	0.002		-0.007		-0.021	
Household Characteristics						
Mother's Education	0.041		0.049		0.019	
Father's Education	0.046		0.036		0.054	
Number of Siblings	0.221		0.177		0.238	
Nonagricultural wage income in 2008 (in log form)	-0.018		0.097		-0.197	
Number of moves in cities	0.036		0.026		0.086	
Duration of Stay in the cities	-0.043		-0.037		-0.017	
Children's Living Space	0.010		0.011		0.019	+
Contextual Variables						
School Type (Ref=Other Schools)						
Urban Public Schools	1.078	**	1.252	**	1.313	**
Migrant Schools	0.379		0.487		0.485	
Urban schools require fees for migrant children (yes=1)	0.280		0.183		0.158	
Interactions:						
Migrant Children with One Parent Only × Nonagricultural wage income in 2008			-1.569	***		
Migrant Children with One Parent Only × Children's Living Space			0.044	+		
Boys × Number of moves in cities					-0.084	
Boys × Duration of Stay in the cities					-0.030	
Boys × Nonagricultural wage income in 2008					0.555	
Boys × Migrant Children with One Parent Only					-3.447	***
Boys × Children's Living Space					-0.015	
Intercept 1	-2.855		-1.701		-4.459	
Intercept 2	-0.493		0.704		-2.086	
Intercept 3	1.627		2.876		0.112	
Intercept 4	3.190		4.470		1.761	
Number of Cases	259		259		259	
Prob > F	0.098		0.002		0.000	

Note: + significant at 0.1 level; * 0.05 level; ** 0.01 level; *** 0.001 level

Appendix T2.3 Ordered Logistic Regression on Math (Coefficients): Left-Behind Children

	Model 1		Model 2		Model 3	
Family Arrangement (Ref.=left behind with others)						
Left-Behind with Mother	0.252		6.408		0.260	
Left-Behind with Grandparents	0.168		9.424	+	0.195	
Individual Characteristics						
Gender of Children (Ref.=Girls)	-0.367	+	-0.441		2.279	
Age of Children	0.005		0.014		0.004	
Household Characteristics						
Mother's Education	0.030		0.036		0.035	
Father's Education	0.032		0.041		0.031	
Number of Siblings	-0.193		-0.249		-0.173	
Nonagricultural wage income in 2008 (in log form)	0.378	+	0.832	*	0.555	*
Duration of Stay in the cities	0.068	**	0.072	**	0.042	
Children's Living Space	4.1E-04		0.001		1.2E-04	
Interactions:						
Left-Behind with Mother × Boys			-0.126			
Left-Behind with Grandparents × Boys			0.178			
Left-Behind with Mother × Nonagricultural wage income in 2008			-0.560			
Left-Behind with Grandparents × Nonagricultural wage income in 2008			-0.908	+		
Left-Behind with Mother × Children's Living Space			-0.003			
Left-Behind with Grandparents × Children's Living Space			0.001			
Boys × Nonagricultural wage income in 2008					-0.294	
Boys × Duration of Stay in the cities					0.043	
Boys × Children's Living Space					0.001	
Intercept 1	1.500		6.327		3.154	
Intercept 2	2.937		7.786	*	4.591	+
Intercept 3	4.645	*	9.511	**	6.308	*
Intercept 4	6.079	**	10.966	**	7.752	**
Number of Cases	320		320		320	
Prob > F	0.019		0.072		0.033	

Note: + significant at 0.1 level; * 0.05 level; ** 0.01 level; *** 0.001 level

[i] About 70%-90% of migrants in each city were registered. If the sampled migrant had moved away, we continued the systematic random sampling until we reached the desired sample size. The percentage of replacement ranged between15% and 30%, usually higher in larger cities.

[ii] Left behind children living with others include those living with relatives (other than grandparents), living alone, and living in school dorms or with teachers.

[iii] Migrant children living with mother only and migrant children living with father only have relatively small numbers, thus we combine these two categories as migrant children living with one parent.

[iv] While the central government has required urban schools to treat migrant children the same as urban children, schools in many cities continue to demand migrants to pay additional fee for their children to enroll in urban public schools. Among all surveyed cities, public urban schools in the following cities require additional fees for migrant children to attend: Dongguan, Guangzhou, Sanhe, Ningbo, Weifang, Leqing, Zhongshan, and Chongqing. The rest of sampled cities do not require fees, including Jinan, Chengdu, Nanchong, and Jiangyin city (Tao et al., 2011).

[v] The coefficient for migrant children with one parent is 9.881 and the coefficient for the interaction between that and income is −1.010.