Spatial Inequality in Children’s Schooling in the Province of Gansu, Western China: Reality and Challenges

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Abstract: China has been experiencing considerable economic growth following the economic reforms of 1978, while simultaneously facing dramatic increases in regional inequality. China is indeed becoming a polarized society – a phenomenon which is at the heart of a multitude of serious problems that are threatening sustainable development, as well as social cohesion, within the country. Among the key reasons for this polarization are the quality of and accessibility to basic education for children. Since the establishment of the law for nine-year compulsory education in 1986, children’s education has progressed remarkably in most parts of China. It has, however, remained persistently problematic in the Western provinces, particularly in remote regions, rural areas and minority communities. Even though some studies on child education in China have been carried out, very little existing research examines spatial inequality in children’s schooling or accounts for the importance of socio-cultural and geographic contexts. Using the example of Gansu, one of the poorest provinces in Western China, and applying a geographic approach, our research emphasizes the two main aspects that have led to high non-schooling rates for children: an unfavourable socio-cultural milieu, and inadequate educational resources.

Keywords: Children’s schooling, spatial inequality, Gansu, Western China


Mots-clés : la scolarisation des enfants, les inégalités spatiales, le Gansu, l’Ouest de la Chine
1-INTRODUCTION

China’s phenomenal economic growth since the introduction of economic reforms in the late 1970s, along with the hosting of the 2008 Olympics in Beijing and the 2010 World Expo in Shanghai, have captured the attention of the world. Despite its incredible economic development, however, China has since the 1990s also experienced dramatic increases in regional inequality. China is, in fact, becoming a polarized society in two dimensions: inland-coastal and rural-urban, as is usually the case in any typical core-periphery spatial organization (Tsui 1991; Chen and Fleisher 1996; Jalan and Ravallion 1998; Zhang and Kanbur 2001; Cao et al. 2005; Kanbur and Zhang 2005). While the ultramodern metropolises and littoral zones of the eastern coast are definitely at the core of growth activities in China, continued polarized development underlies numerous social and demographic shortcomings among poor hinterlands in the West (Song and George 2000).

The great majority of the approximately 48 million people living under the official poverty line in China are located in the western provinces (World Bank 2001). The situation is most pronounced in the rural ethnic minority areas of the West, while urban areas enjoy a much higher standard of living. Among the key reasons for this polarization are the quality of and accessibility to basic education for children (Adams and Hannum 2005). Following the development of human capital theory in the early sixties, education became a popular independent variable in income distribution studies (Psacharopoulos 1988). Some empirical studies (Checchi 2003; de Gregorio and Lee 2002) demonstrate that greater income inequality hinders access to schooling because education is unaffordable for poor families, while lower income inequality facilitates access to education and thus contributes to a reduction in education inequality. Relying mainly upon average attainments, most studies recognize the existence of a relationship between income inequality and educational inequality (Checchi 2003). The availability of social services such as education is, in fact, an important indicator of income differentials, not only because the levels of social service provision directly affect standards of living, but also because their trends are harbingers of the regions’ potential future growth path (West and Wang 1995).

An analysis of the causes and consequences of spatial inequality in educational access in China offers particular insight into the sources and implications of educational disparities in other national contexts, including Canadian society. One of the purposes of this study is to make findings that could be generalizable in the future. China and Canada both have important commonalities which make the comparison theoretically rich and relevant. Some of the important commonalities include geography, demography (both are multicultural societies), and education (both have bilingual education systems in some areas). Spatial patterns of inequality in educational provision and access in China may significantly vary from or resemble geographic patterns of schooling in Canadian society. Identifying the reasons behind such commonalities and differences is a promising step toward creating and validating some important hypotheses in regional development and social inequality literatures.

A growing body of literature has attempted to describe and explain patterns of regional inequalities in China. Such literature has overwhelmingly linked regional development gaps to income disparities. As a result, studies on regional inequalities in China have neglected the importance of educational inequalities as both a cause and a consequence of regional disparities (Chen and Martin 1996; Aberge and Li 1997; Demurger et al. 2002; Khan et al. 1993; Zhang and
Moreover, few studies have examined the possible links between income levels and accessibility to education in China (Chow and Shen 2006). The limited number of studies on education provision, and more particularly on children's schooling, have seldom accounted for the importance of socio-cultural and geographic contexts. The latter are, however, extremely important, because culture, environment and identity are all closely interlinked (van de Walle 2003). These contexts manifest themselves very differently across China due to the highly concentrated nature of spatial distribution of minority populations in China’s western region. Although minorities constitute only a small fraction (approximately 8%) of the Chinese population, in some autonomous regions of the west minorities dominate the Han population.

Traditional perceptions, as well as harsh natural conditions, continue to shape the educational choices and behaviours of minority populations (Zhang and Fan 2004; Colin 2005). In China, about 1.5 million elementary school students and 2 million lower secondary school students quit schooling before they graduate, with an overwhelming majority of these students living in western rural ethnic minority communities and remote mountainous areas (Xue and Tian 2001).

Why is there such a wide gap in the delivery of services in different regions, given the fact that compulsory education is free and has traditionally been provided by the government in China? What are the consequences of such wide educational disparities?

This article addresses important questions which remain undiscussed in existing literature on the transitional socialist economy and society of China. Using the case study of Gansu, one of the poorest provinces in Western China, and applying a geographic approach, this paper examines the spatial patterns of non-schooling rates among children, and explores the gender bias in children's educational inequality. It also investigates the factors responsible for such spatial patterns. The article departs from current literature on regional development and the transitional socialist Chinese political economy by arguing that the decentralization of finances in education has worsened educational outcomes for children, particularly for ethnic minorities living in remote parts of China, where the educational resources enjoyed by richer provinces and regions of China have been unavailable. The decentralization of educational finances has thus made geographic factors even more important in our understanding of the causes of educational gaps across regions.

The next section of the article is a literature review of the role of education in a modernizing economy, with a particular focus on China. The subsequent section describes the unsettling situation in children’s education in Gansu in 2000. The fourth section presents an outline of the data and the methods of analysis used. The fifth section discusses the regression results, and the final section offers concluding remarks which highlight the challenges of educating children in the context of the economic modernization process in China.

2-EDUCATION, DEVELOPMENT AND MODERNIZATION, WITH A PARTICULAR FOCUS ON CHINA

Existing literature on education and development has focused on linking development to economic growth. Scholars such as Psacharopoulos (1988) suggest that there is a close and positive relationship between education and economic growth. It is accepted by many that education is a form of investment with the potential to contribute to social and individual development (Lockheed and Vespoor 1991; Checchi 2003). The followers of human capital theory believe that education provides the necessary skills for a higher level of productivity
among people in both the marketplace and the household. Two well-documented facts support this idea: (1) a correlation exists between a worker’s income and his or her highest level of completed education, and (2) workers with more education start with higher wages than the less educated, and their earnings profile increases more quickly (Brock and Cammish 1991; Oxaal 1997).

Psacharopoulos (1988) argues that the links between education and development are very complex. He provides one way of analyzing these relationships: by dividing them into ‘external efficiency of education’ (direct link between school participation and occupational attainment) and ‘internal efficiency of education’ (linkages between family background, schooling and learning outcomes). In this manner, Psacharopoulos demonstrates that education has a variety of effects that improve individual productivity not only in the marketplace, but also in the household.

Undeniably, education has a leading role to play in the economic and social development of poor developing countries. The largest source of funding for education in developing countries, the World Bank, highlights the important role of education in the development process:

\[ \text{Education – especially basic (primary and lower-secondary) education – helps reduce poverty by increasing the productivity of the poor, by reducing fertility and improving health, and by equipping people with the skills they need to participate fully in economy and society (World Bank 1995, 1).} \]

Scholars such as Oxaal (1997) have emphasized the ways in which development leads to the reduction of poverty. In support of human capital theory, it has been documented that primary education in particular increases the productivity of rural farmers and the self-employed, while simultaneously improving their earnings. Whether education enhances personal abilities or simply identifies talent, as suggested by the ‘screening’ theory, it has been shown that not only is each additional year of education associated with higher earnings, but also that educated women are able to manage their fertility better, and thus have some measure of control over the family’s financial situation (Oxaal 1997).

Although highly beneficial in the long-run, the schooling of children in poor countries always involves a tradeoff between low, immediate earnings and higher future earnings following additional education (Psacharopoulos 1988). Both human capital and correspondence theories imply that an “effective anti-poverty strategy should incorporate the enhancement of education and skills amongst poor households” (Oxaal 1997, 4), as there are significant linkages between poverty and education. At the macro level, levels of enrolment correlate with the GNP, while at the micro level poor children, and particularly girls, are less likely to enrol. In addition to the lack of financial capacity to pay school fees, poor families often lack access to formal credit, and have limited social networks through which they can borrow money (Hannum and Kong 2002). Poverty acts as both a barrier to education and an outcome of the lack of education. Poverty alleviation and gender equality strategies focusing on investment in education greatly depend on government financing. It has been shown (Colclough 1996) that the removal of costs of schooling has a dramatic increase in school enrolment. Demery (1996) argues that government spending on upper-secondary and higher levels of education generally favours well-off populations, while public spending on primary education by and large benefits the poor.
It is widely recognized that China’s economic reforms since 1978, although very successful in achieving high economic growth rates, have been accompanied by substantial increases in income disparity at different scales: inter-regional and intra-regional (urban versus rural areas), as well as between groups of individuals (Kanbur and Zhang 1999; Wu and Perloff 2004). Johnson (2000) has summarized three major policy areas that have adversely affected income disparity in China: restrictions on rural-to-urban migration, frequent inaccessibility of education in rural areas, and the “urban-biased policy mix”, which included increased urban subsidies, investments, and banking credits that have brought about higher inflationary taxes on rural earnings. In fact, China’s distributational policies have always manifested a strong urban bias since the foundation of People’s Republic of China in 1949 (Lin et al. 1996; Liu et al. 2002). Compared to the level of social expenditure in cities, rural areas have received far less. Nevertheless, until the early 1980s the government adopted an alternative strategy in rural areas to promote basic education. At that time, agricultural collectivization led to the creation of a large number of “commune schools” that made access to basic education much easier (Tsang 1994; Hannum 2003). Also, the fiscal system at that time played an important redistributive role, extracting large surpluses from the rich provinces and making large transfers to poor regions.

Following fiscal reforms in the mid-1980s, however, both the willingness and the ability to effect equalization weakened, and all levels of government have since moved toward a higher degree of self-financing (West and Wong 1995). With this reality, reductions in the redistributive power of the central government directly affected the provision of public services, primarily education, with households becoming the unit of decision-making. Responsibilities for social public services have been decentralized, costs to individuals have increased, and services have decreased (Zhang and Kanbur 2005). The government’s share in total education expenditure declined from 64.6% in 1990 to 53.1% in 1998, while the share of tuition and incidental fees paid by individuals rose from 2.3% to 12.5% in the nine-year period (Adams and Hannum 2005). Many local governments in poor regions consequently often lack the proper resources to invest in education infrastructure, which limits and slows down the possibility for children to access necessary educational materials and resources (Connelly and Zheng 2000; Hannum 2001). School buildings, for example, are crude and often dangerous, chairs and benches are inadequate. Many teachers in these regions do not have adequate qualifications and lack opportunities for in-service training. Increasing household out-of-pocket education expenses mean that children in poor families have increasing difficulty finishing the basic nine years of school, likely leading to more uneven access to education.

Moreover, some of China’s socio-cultural traditions make the existing inequalities in providing education for children even worse, particularly for girls in Western China. It is in the Chinese Confucian tradition to value sons more than daughters. Boys are seen as carrying on the family line while girls, upon marrying, leave the family and become outsiders. This discourages parents from investing in someone who will soon become part of another family. As a consequence, girls and education are ideologically difficult to reconcile. According to Sang (2004), Wang (2001), and Yang and Zhang (1996), the tradition of valuing only sons generally implies the following: (1) most parents have a strong tendency to be less attentive to the formal education of their daughters, (2) heavier domestic demands are placed on girls, and (3) families have a large number of children to ensure a son is born. High fertility reduces educational accessibility to a few privileged members of a family (Oxaal 1997). Where boys and girls both have equal opportunities, parents prefer to let the boy pursue his education rather than the girl (Hannum and
Kong 2002). Also, with new wage-earning opportunities for children, girls are more likely to become economic supporters of the household than the boys. It is common, therefore, for families to pay for the education of their boys rather than their girls; parents must choose, for they are unable to send all their children to school. All these aspects directly or indirectly restrict the enrolment of girls in educational institutions and/or schools.

Some traditional cultures and religions also restrain the behaviour of girls (Ao 2004; Liu 1999; Ren 1996). According to the Islamic Koran, a girl older than nine must restrain her behaviour in public (Liang 2002). Among Muslim communities living in remote mountainous areas, parents rarely encourage their daughters to go to school. Whether they attend school or not is a minor issue. Girls in those communities tend to follow ancestral traditions: they learn to do the housework, then get married, give birth, and take care of the family. Education is not always an option. Muslim girls at the ages of 8 and 9 are still viewed as being too young for housework, so they often have the opportunity to attend elementary school. At the age of 12 or 13, however, girls are already considered as adults and are often required to drop out of school to help with the housework. At the age of 15 or 16, they get engaged, and at the age of 17 or 18, they get married. After the age of 12, girls cannot stay home alone. They cannot chat with a boy without supervision; some cannot even leave the house. These sorts of traditional customs in rural minority areas impede the educational and professional prospects of girls, and contribute to female illiteracy in minority regions.

Considering the socio-cultural and geographic contexts particular to China’s western region, as in the case of Gansu, what will be the situation of education for children, especially in the context of the transitional socialist Chinese economy and society? More particularly, what will be the role of the spatial segregation of ethnic minority groups in Gansu vis-à-vis the disparity in children’s education?

Gansu is well known for being an important part of the historic Silk Road. Although Gansu does not have the title of an Autonomous Minority Region, the cohabitation of Han and various ethnic minorities makes it a very interesting region for such a case study in Western China. To understand the representativeness of Gansu, let us take a brief look at this province in the context of Western China and China as a whole.

2-1 Gansu in context of Western China and China

Western China is one of the country’s three main regions. It represents 76.65% of the total national territory, but only 28.56% of the total national population. The minority ethnic population accounts for 8.4% of the national population, and for 32% of the Western population. Historically, Western China lagged behind other regions in terms of national economic development. In 2000, its GDP represented only 19.22% of the total national GDP. The government also invests less in Western China; its investments represent only 19.24% of total government investment. Western China’s urbanization rate is only 28%, as compared to the 36.2% nation-wide rate.
Table 1
Socio-economic and Educational Characteristics of Gansu, Western China and China

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Gansu</th>
<th>Western China</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social economy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population (million)</td>
<td>25.75</td>
<td>364.47</td>
<td>1276.27</td>
</tr>
<tr>
<td>Ethnic population (%)</td>
<td>8.93</td>
<td>32.0</td>
<td>8.4</td>
</tr>
<tr>
<td>Urbanization Rate (%)</td>
<td>24.0</td>
<td>28.0</td>
<td>36.2</td>
</tr>
<tr>
<td>GDP (million RMB)</td>
<td>107.25</td>
<td>1814.61</td>
<td>9439.64</td>
</tr>
<tr>
<td>Total investment in fixed assets (billion RMB)</td>
<td>46.04</td>
<td>715.88</td>
<td>3721.35</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate or semi-illiterate population (%)</td>
<td>23.6</td>
<td>21.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Population with primary education (%)</td>
<td>30.9</td>
<td>35.3</td>
<td>33.3</td>
</tr>
<tr>
<td>Population with lower secondary education (%)</td>
<td>31.1</td>
<td>30.1</td>
<td>39.9</td>
</tr>
<tr>
<td>Population with higher secondary education (%)</td>
<td>11.3</td>
<td>10.0</td>
<td>11.9</td>
</tr>
<tr>
<td>Population with college or university education (%)</td>
<td>3.1</td>
<td>3.6</td>
<td>3.9</td>
</tr>
</tbody>
</table>

**SOURCE:** China Statistical Yearbook 2001

Due to such unfavourable socio-economic conditions resulting from unbalanced development, the average education level of the populations of Western China, and of Gansu, is considerably lower than it is in the rest of the country (Table 1). An illiterate or semi-illiterate population accounts for approximately 11% of the national population; in Western China the proportion is substantially higher at 21%, while in Gansu it is 23.6% – more than twice the national average. The proportion of the national population with primary school as the highest level of completed education is 33.3%; in Western China it is slightly higher at 35.3%, while in Gansu it is only 30.9%. At the same time, the percentage of the total national population with completed lower secondary school is approximately 39.9%; in the Western regions it is only 30.1%, and in Gansu it is 31.1%. Taking it one level further, the proportion of the total nation-wide population with completed higher secondary education is only about one fourth of the national population, approximately 11.9%; in Western China, this proportion is 10%, while the province of Gansu has a similar proportion of population with completed higher secondary education as at the national level of 11.3%. Possession of higher education (college and university) is relatively less common in China, with only 3.9% of the population having completed this level of education across the nation, while in the Western provinces and in Gansu, the proportion is 3.6% and 3.1% respectively.

Gansu is located at the intersection of the Loess, Inner Mongolian and Tibetan-Qinghai Plateau, which gives its distinctive socioeconomic and cultural characteristics. This particular geographical location with respect to its neighbouring province has had a strong influence on the spatial distribution of minority populations in Gansu. Kazaks, Salars and Mongols are located in the northwestern autonomous minority counties, which are related to the adjacent minority autonomy regions of Xinjiang and Inner Mongolia situated north of Gansu. The Hui and Tibetans are located in southern Gansu near the provinces of Qinghai and Sichuan (Figure 1). In Gansu, minority populations account for 8.93% of the 25 million total population, which includes 45 ethnic minority groups. Most of these groups live in the 20 government-designated minority
autonomous counties,\(^1\) which represent nearly 34% of the provincial territory (Gansu Statistical Yearbook 2001). The county is the basic administrative division of the province. There are 80 counties spread throughout the five major geographical regions of Gansu province: Hexi in the Northwest, Zhongbu in the Center, Ganlin in the Southwest,\(^2\) Longdong in the Southeast, and Longnan in the South (Figure 1).

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure1.png}
\caption{Location of Gansu province and its five major geographical regions}
\end{figure}

\(^1\) There are three categories of minority autonomous areas in China corresponding to the three judicial levels of government: (1) autonomous region (provincial-level), (2) autonomous prefecture, and (3) autonomous county/banner. Since the foundation of the People’s Republic of China in 1949, a number of areas with considerable proportions of ethnic minority populations were designated as autonomous regions, prefectures or counties, depending on their size. These areas are recognized in China’s constitution and are given various special rights distinct from other administrative divisions (Wang, 2005).

\(^2\) Ganlin is the only exclusively minority region among the five major geographical regions in Gansu. Ganlin consists of the Gannan and Linxia minority autonomous prefectures. Gannan, consisting of 7 counties, is a Tibetan Autonomous Prefecture, and its population follows Tibetan Buddhism. Linxia, divided into 8 counties, is a Hui Autonomous Prefecture next to the Gannan prefecture, where the Muslim Hui people are concentrated.

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3-UNSETTLING SITUATION IN CHILDREN’S EDUCATION

Since the establishment of the law for nine-year compulsory education in 1986, children’s education has progressed remarkably in most parts of China. It has, however, remained a persistent problem in Western provinces such as Gansu – particularly in remote regions, rural areas and minority communities (Yang and Liang 2004).

3-1 Elementary versus lower secondary schools

As illustrated in Table 2, the average non-schooling rate of children between the ages of 6-15 in 2000 was close to 10 percent in Gansu. The average for elementary schools was only 2.42 percent; for lower secondary schools, it reached 25.16 percent – more than ten times higher than the rate at the elementary level. Moreover, the non-schooling rate among children between the ages of 13 and 15 varies according to diverse regions, with the highest rate reaching 81.60 percent in the Maqu minority county, located in the southernmost part of the province (point 1, Figure 2-A).

Table 2
Children’s (aged 6-15) non-schooling rate at the elementary and lower secondary school levels in Gansu, 2000

<table>
<thead>
<tr>
<th>School</th>
<th>Children Average (%)</th>
<th>Max. (%)</th>
<th>Girls Average (%)</th>
<th>Max. (%)</th>
<th>Boys Average (%)</th>
<th>Max. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary</td>
<td>2.42</td>
<td>15.37</td>
<td>3.05</td>
<td>28.16</td>
<td>1.88</td>
<td>14.16</td>
</tr>
<tr>
<td>Lower Secondary</td>
<td>25.15</td>
<td>81.60</td>
<td>26.33</td>
<td>83.77</td>
<td>24.09</td>
<td>81.37</td>
</tr>
<tr>
<td>Elementary &amp; Lower Secondary</td>
<td>9.89</td>
<td>37.67</td>
<td>10.66</td>
<td>46.37</td>
<td>9.20</td>
<td>36.51</td>
</tr>
</tbody>
</table>

SOURCE: Gansu Education Yearbook 2001

In 2000, the spatial distribution of the non-schooling rate in lower secondary schools in Gansu demonstrated an important characteristic: a relatively consistent spatial distribution of high rates in south portions of the province such as Ganlin. The rate is relatively low in most counties of the northern Hexi region, with the exception of the Tianszhu Tibetan minority county (point 2, Figure 2-A) where the non-schooling rate is a very high 49.02%.

In contrast with elementary schools, the situation at the lower secondary school level very evidently exhibits a higher non-schooling rate average. In 2000, only 29 counties had a non-schooling rate ranging between 0 and 3% at the lower secondary level, while 66 counties reached these rates at the elementary level (Figures 2 and 3). Also, in the year 2000, 16 counties had the second highest non-schooling proportions (ranging from 35-64%) at the lower secondary level, while 12 other counties had the highest non-schooling proportions (ranging from 65-82%). None of the elementary schools in the province are in these two highest rate categories (Figure 3). It is important to note that among these 28 counties where the non-schooling rate for lower secondary school is more than 35%, 23 counties are considered by the government as poverty-stricken counties, and 16 counties are minority counties.

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3 Nine-year compulsory education is comprised of two stages: 6 years at elementary school (ages 6-12) and 3 years at lower secondary school (ages 13-15).

4 In order to use poverty relief funds in a planned and organized way, and to effectively aid the poor and needy, the Chinese government has formulated a standard for identifying key poverty-stricken counties in need of aid. The
Figure 2
Spatial distribution of the non-schooling rate in elementary and lower secondary schools in Gansu, 2000

Figure 3
Comparison of the number of counties in the five categories of children’s non-schooling rate at the elementary and lower secondary school levels in Gansu, 2000

standard for key poverty-stricken counties was defined in 1986 to include counties with a yearly net income of less than 150 yuan per peasant in 1985. The standard was subsequently adjusted over the years in accordance with the economic development and constant improvement of economic conditions in poverty-stricken counties (State Council, 1994).
The problem facing children’s education in Gansu lies mainly at the lower secondary school level. Although Gansu has made remarkable progress at the elementary school level since the introduction of the nine-year compulsory education law, the province has failed to attain the universal level as requested by law. This is due to its extremely high lower secondary non-schooling rate, often in poor areas, and in minority counties.

3-2 Gender inequality versus girls’ education

A comparison of lower secondary non-schooling rates between girls and boys in Gansu (Table 2) reveals that the average non-attendance rate for boys in 2000 was 24.09, while for girls it reached 26.33. These relatively similar non-schooling rates are, however, quite different in a number of counties. Figure 4 illustrates the spatial distribution of differences in lower secondary school non-attendance rates between girls and boys. Specific local conditions play an important role in schooling for girls. The widest gaps are observed mainly in the south region; they are less present in the northern Hexi region. Girls' non-attendance is also often worse in minority populated and poor counties. Of the 80 counties in the province, nearly 50% (39 counties) have a higher non-schooling rate for girls than for boys. Only twenty-five percent (20 counties) of the counties face the opposite situation – a higher non-schooling rate for boys. The difference, however, is only 5% or less. In twenty-one counties, the difference between girl and the boy non-schooling rates is almost nonexistent. Among the 22 counties where the non-schooling rate is more than 4% higher for girls, 18 are poverty counties, 13 are minority counties, and 10 are minority and poverty counties (Figure 4). Accessibility to education for girls is obviously associated with unfavourable socioeconomic conditions, as well as the concentration of minority groups.

Figure 4
Spatial distribution of girl and boy non-schooling rates at the lower secondary school level in Gansu, 2000
As a result, apart from the counties that are considered poverty-stricken by the government, it
seems that counties with substantial concentrations of ethnic minority groups are also more
affected by lower secondary school non-schooling rates than counties populated primarily by the
Han nationality. What is the exact role of spatial distribution of minorities in children’s
education inequality in Gansu, especially with respect to the gender issue? Moreover, with the
explanation variables of poverty county and minority concentration, what are the roles of other
independent variables which potentially influence the disparity of children’s education as
suggested in the literature review? A multiple regression analysis was applied to answer these
questions.

4-Data and Methods

In order to examine the individual effects of each of the different variables on disparity in
children’s education in Gansu, including gender difference, two multiple regression analyses, one
for girls and another for boys, were carried out. Multiple regression analysis has been widely
employed to study the relationship between several independent variables (or predictors) and a
dependent variable, as well as to identify the effect that each predictor has on the dependent
variable. We define girls’ and boys’ lower secondary non-schooling rates in year 2000 as the
dependent variable for each regression analysis. The lower secondary non-schooling rate (NSr)
represents the school-aged population (ages 13-15) not attending school, which is calculated by
subtracting the school-aged population attending school (As) from the total school-aged
population (Sa), divided by the total school-aged population (see the formula below).

Dependent variable: \[ NSr(g,b)_i = \frac{Sa_i - As_i}{Sa_i} \]  

where \( i \) indicates a specific county, and \( g \) and \( b \) represent girls and boys respectively.

Guided by the literature review, six independent variables (predictors) have been selected to
correspond to the following three aspects: socio-cultural milieu, educational resources and
economic conditions.

Socio-cultural milieu:
1) Female illiteracy, “Fi”, represents the illiteracy rate among women over 15 years of age.
2) Minority concentration, “Mc”, is measured by the location quotient (LQ). LQ is a measure
most frequently used in economic geography and locational analysis. In this study, LQ estimates
the relative significance of a particular ethnic group concentration in a particular county
compared with its significance in a larger region (Gansu as a whole). The equation is as follows:

\[ Mc_i = \frac{M_i / \sum_{i=1}^{n} M_i}{P_i / \sum_{i=1}^{n} P_i} \]  

where \( M_i \) and \( P_i \) respectively represent the minority population and total population of the \( i \)th
county in Gansu, and \( n \) represents the number of counties in Gansu.
Educational access:
3) School density, “Sd”, is measured by the number of lower secondary schools in each county divided by 100 km².
4) Student/teacher ratio, “St”, is calculated by dividing the lower secondary school-aged population in each county by the number of teachers in the lower secondary schools.

Economic conditions:
5) Poverty county, “Pc”, is a government-designated status for poor areas. Poverty-stricken counties are defined as counties with a yearly net income of less than 150 yuan per peasant. Since poverty county is a category variable, we attribute “1” if the county is a poverty county, and “0” if it is not.
6) Government investment, “Gi”, signifies the total investment in fixed assets in a county, referring to the volume of construction activities and purchases of fixed assets and related fees, expressed in monetary terms (Gansu Statistical Yearbook 2001).

In the regression analysis, all data come from the following four sources: Gansu Census 2000, Gansu Education Yearbook 2001, Gansu Yearbook 2001 and China Yearbook 2001 (Yearbook 2001 presents data from 2000). Census and Yearbook data are, in fact, quite different. Census data is collected through questionnaires directly from individuals; it provides information exclusively on socioeconomic and demographic characteristics of the population. Conversely, Yearbooks contain information on basic administrative divisions at the county level, as gathered by the Provincial Bureau of Statistics of China. Yearbooks provide mainly information on the socioeconomic situation of particular areas (e.g. county), including aggregated socioeconomic characteristics of the population. Census data is more dependable than Yearbook information, because the national census is the largest and most exhaustive investigation in China. Yearbooks, however, are excellent sources for specific area data.

Although the Gansu and China Yearbooks have been published each year since 1991, Gansu Census 2000, based on the 5th national census collected in 2000, is the most recent census in China. Gansu Education Yearbook 2001 is also the latest publication of its kind available. Our study is thus based on the most recent available information.

5-RESULTS AND DISCUSSION

Table 3 presents multiple regression results showing strong correlations between girl/boy non-schooling rates and the predictors (R = 0.844, R² = 0.712, F =30.137 for girls; R = 0.833, R² = 0.693, F =27.515 for boys). Generally speaking, the socio-cultural milieu has the most significant impact on non-schooling rates for children; educational resources are the second contributor. Economic conditions are the least important in our case study, but they still have a significant impact, particularly for girls’ non-schooling rates. Comparing the regression models 1 and 2 (girls vs. boys), results of both regressions are similar, but with some significant differences. Five of the six predictors, in fact, demonstrate a significant influence on girls’ non-schooling rates, while only four of six predictors significantly affect the non-schooling rate for boys.

Both socio-cultural milieu variables, Fi (female illiteracy) and Mc (minority concentration), have a very strong positive impact on non-schooling rates. Female illiteracy is the most important
explanation variable, which shows that a higher proportion of female illiteracy in the county population results in a higher non-schooling rate among children. Among girls and boys, the Fi variable is slightly more correlated with boys’ non-schooling rates (coefficients’ value B=0.399) than with girls’ (B=0.387). Both these correlations have the highest level of significance: p value less than 0.01. General speaking, the education level of parents is a factor influencing gender gaps in education. Negative attitudes toward education tend to be connected to lower education levels among parents. These attitudes include valuing male education at the expense of female education, as well as placing heavier domestic demands on girls aged 13-15 enrolled in lower secondary school (Xi, 2002). According to Xue and Tian (2001), the poorer the household, the greater the reliance of parents on their daughters to perform domestic duties, and the greater the tendency to prioritize male education. Low levels of education for women are often associated with high levels of fertility, which reduce educational provision within a family. It is important to highlight the fact that parents, especially the mother, are considered to be a child’s first teachers. Subsequently, girls may choose their future orientation according to their mother’s role in life. Girls from these families may lack a clear aim for their learning; they may also lack a sense of competition which can promote the desire to learn. As such, their academic performance is to a large degree doomed to fail, and is usually characterized by grade repetition or dropping out.

Minority concentration is the second explanation variable that also powerfully influences children’s non-schooling rates. Although the difference is small, minority situation seems to have a greater effect on girls’ non-schooling rates (B=0.307) than on boys’ (B=0.289). Some existing literature reveals minority education problems (Liang 2002; Hannum 2003; Adams and Hannum 2005), but the issue has not yet been well documented from a geographical perspective. Our case study will help to fill this gap, and thereby contribute valuable new insight into the issue.

Non-schooling rates are also significantly affected by the aspect of educational resources, which are presented by two variables: School density (Sd) and Student/teacher ratio (St). School density (Sd) was, in fact, found to negatively contribute to the non-schooling rate, meaning that the more schools there are per 100km$^2$, the lower the non-schooling rate for children. It is important to highlight that school availability has affected girls much more than boys (significant at less than 0.05 for girls, compared to 0.10 for boys). This means that girls’ attendance is more affected by the availability and geographical location of schools than boys’ attendance. Inversely, the Student/teacher ratio (St) has a relatively strong positive contribution to girl/boy non-schooling rates, which means that the higher the number of school-aged children per teacher, the higher the non-schooling rate among children.

Compared with the two aspects just described, economic conditions were not found to play an important role in children’s non-schooling rates in our case study. Only the poverty county (Pc) status variable was weakly correlated with girls’ non-schooling rates (B=0.149, p<0.10), while it did not have any significant effect on boys’ non-schooling rates. This means that if a county has poverty county (Pc) status, non-schooling rates among girls will be higher. It is recognized in the literature that educational opportunities for girls in developing countries remains substantially lower than for boys, particularly in poor minority regions (Oxaal 1997). This is related to higher overall costs of girl’s schooling. Apart from direct costs of education (fees, school supplies, clothing and transportation), which are the same for both sexes, there are also opportunity costs (lost chore time and earnings) that are higher for girls in poor households, because they spend more time doing household work on average than boys do. Hannum (2002) found that economic
difficulties, or leaving school to work, were reported for more than one-third of boys who were not in school, and almost 50% of girls. Household poverty, however, is not only one of the factors leading to gender inequality and female disadvantage in schooling, because of cultural traditions and norms that place girls in a vulnerable position in the family (Ma 1997; Hannum and Kong 2002). It is also noted that the variable of Gi (Government investment) was correlated with neither girls’ nor boys’ non-schooling rates.

Table 3
Results of Multiple Regression Analyses

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Model 1 for Girls</th>
<th>Model 2 for Boys</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio-cultural Milieu</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>InFi (Female illiteracy)</td>
<td>0.387</td>
<td>0.399</td>
</tr>
<tr>
<td></td>
<td>(3.707)**</td>
<td>(3.700)**</td>
</tr>
<tr>
<td>InMc (Minority concentration)</td>
<td>0.307</td>
<td>0.289</td>
</tr>
<tr>
<td></td>
<td>(3.557)**</td>
<td>(3.236)**</td>
</tr>
<tr>
<td><strong>Educational Resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>InSd (School density)</td>
<td>-0.142</td>
<td>-0.136</td>
</tr>
<tr>
<td></td>
<td>(-2.005)**</td>
<td>(-1.642)*</td>
</tr>
<tr>
<td>InSt (Student /teacher ratio)</td>
<td>0.184</td>
<td>0.203</td>
</tr>
<tr>
<td></td>
<td>(2.060)**</td>
<td>(2.202)**</td>
</tr>
<tr>
<td><strong>Economic Conditions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>InPc (Poverty county)</td>
<td>0.149</td>
<td>0.106</td>
</tr>
<tr>
<td></td>
<td>(1.911)*</td>
<td>(1.315)</td>
</tr>
<tr>
<td>InGi (Government investment)</td>
<td>0.068</td>
<td>0.066</td>
</tr>
<tr>
<td></td>
<td>(0.954)</td>
<td>(0.894)</td>
</tr>
<tr>
<td><strong>Model Summary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>0.844</td>
<td>0.833</td>
</tr>
<tr>
<td>R²</td>
<td>0.712</td>
<td>0.693</td>
</tr>
<tr>
<td>F statistics</td>
<td>30.137</td>
<td>27.515</td>
</tr>
<tr>
<td>Sample size</td>
<td>80</td>
<td>80</td>
</tr>
</tbody>
</table>

**NOTES:**
* t statistics in brackets.
* *, **, *** represent the level of significance greater than or equal to 0.10; 0.05; 0.01 respectively.

Dependent Variable of Model 1: Girls’ non-schooling rate
Dependent Variable of Model 2: Boys’ non-schooling rate

5-1 Spatial segregation of ethnic minority groups in Gansu
Our regression analysis clearly demonstrates that spatial distribution of minorities plays an important role in explaining disparity in children’s education. In fact, the concentration of ethnic minorities in particular areas reflects not only their spatial segregation, but also the degree of socioeconomic exclusion from the majority. In Table 4, we can see a vital difference between the non-schooling rates of children in lower secondary schools of minority and non-minority counties (56.7% vs. 16.2% for girls; 51% vs. 15.1% for boys). Moreover, the disparity between girls’ and boys’ non-schooling is much more pronounced in minority counties than in non-minority counties (5.7% vs. 1.1%). In cases where minority counties are also government designated
poverty counties, the disparity in children’s education is even greater. Girls’ non-schooling rates in minority-poverty counties of Gansu reached nearly 70% and, while it is slightly lower for boys (60.9%), the rate is still almost 4 times higher than it is in non-minority counties. Also, the difference between girls’ and boys’ non-schooling rates is, at 8.2%, greatest in these minority-poverty counties.

Table 4
Non-schooling rates at the lower secondary schools in non-minority, minority and poverty counties in Gansu, 2000

<table>
<thead>
<tr>
<th></th>
<th>Girls</th>
<th>Boys</th>
<th>Difference between Girls’ and boys’ non-schooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provincial average</td>
<td>26.3%</td>
<td>24.1%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Non-minority county</td>
<td>16.2%</td>
<td>15.1%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Minority county</td>
<td>56.7%</td>
<td>51.0%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Minority and poverty county</td>
<td>69.0%</td>
<td>60.9%</td>
<td>8.2%</td>
</tr>
</tbody>
</table>

SOURCE: Gansu Education Yearbook 2001

The education situation in Gansu’s minority counties is, in fact, partially due to the imbalances in modernization processes triggered by economic reforms, which had significant implications for the well being of minority communities (Liang 2002). These reforms have indeed reinforced urban-rural as well as minority-majority inequalities in terms of access to education and quality of education for a number of minority groups. Hannum (2002) emphasizes that the socioeconomic reforms implemented during the 1980s had mixed effects on educational indicators for ethnic minorities. Certain ethnic minority groups, such as the Koreans, have benefited from the opportunities generated by modernization. Other ethnic groups such as the Hui in Gansu have, however, suffered from the structural shifts in China’s education system and economy. According to Zhou (2001), 21 or 22 minority groups lagged behind the Han Chinese in terms of educational resources during the 1980s and 1990s (p. 140). Although national statistics show that the education composition of China’s minority population was improving steadily during this time, Hannum’s (2001) analysis of census and survey data suggests that in certain minority regions, improvements were not as rapid as for the Han Chinese population. Even though children of some ethnic groups enjoy levels of educational attainment that compare favourably with those of the majority Han Chinese, most have much lower levels of attainment. Lower socio-economic status among ethnic minorities is one of the reasons explaining this tendency. Compared to Han Chinese, minorities are more likely to live in rural areas located in the poorer interior regions of China. This means that children from many minority ethnic groups face problems that are typically associated with poverty, including poor-quality schooling, insufficient resources to pay for school fees, and further walking distances to reach schools. Poverty is also linked with gender disparities among minority groups: ethnic groups displaying the greatest gender disparity in school enrolment are those characterized by high rates of poverty. In addition, minority girls are more likely than any other group to report economic causes for dropping out of school (Yang 2001).

5-2 Access to schooling in Gansu
Our analysis indicates that educational resources determining access to schooling in Gansu play an important role in explaining children’s education disparity.
First, the geographical features of Gansu province create substantial difficulties associated with access to schools (Li and Wang 2002). In terms of providing education for children, increased distance from schools increases both the opportunity cost of acquiring education and gender disparities in the school attendance rate (Cao and Villeneuve 1997). Some parents worry about their children’s safety, while others, such as some minority groups and religious communities, fear for their daughters’ moral reputation (Baden and Green 1994). We can, in fact, see in Figure 5 that counties with a relatively weak density of lower secondary schools have a higher girls’ non-schooling rate, which is the case in the major geographical regions of Ganlin, Zhangbu, Longnan and Longdong. In Ganlin, Zhongbu and Longnan, mountains and plateaus comprise 70% of the total area. As for the pastoral area located in the minority counties of Ganlin, where there is more grassland, residential areas are scattered sporadically, and the population density in some areas averages less than 2 persons per square kilometre. There are some exceptions, however. The minority pastoral areas in Hexi, for instance, have the lowest school density rates, but a relatively low non-schooling rate in lower secondary schools (see point 1 for Mongolian county and point 2 for Akesi county in Figure 5). This can be partially explained by their relatively high GDP and rural income, as well as by the settlement of a large number of elderly people and school-aged children after 1985 (Ma 2000).

Figure 5
Spatial Distribution of Girls’ Non-schooling Rates and Density of Lower Secondary Schools in Gansu, 2000

Disparity in children’s education is also associated with the unfavourable teaching conditions that persist in Gansu schools – conditions that lead to high ratios between the school-aged population
and the number of teachers at school. Appointed teachers do not stay for long, and potential teachers do not wish to settle down in remote, underdeveloped areas. Staff turnover is high, and most of the newly appointed teachers are young and inexperienced (Bai 2003). Transportation is difficult in the mountains and deep valleys. This not only hinders teacher attendance, but also creates difficulties in upgrading teaching skills, and in providing a broader flow of information. Many teachers do not have the necessary qualifications and lack opportunities for in-service training. Teacher salaries are often delayed because education is locally funded and has limited resources. Due to the lack of necessary investment, educational materials are frequently of extremely low quality and are not always available. Moreover, the unfavourable teaching conditions, combined with bad transportation services and difficult weather conditions, have the effect of decreasing the numbers of female teachers in these remote locations. Women do not feel secure in such social and environmental conditions; consequently, many rural schools have mostly male teachers. This creates a serious gender bias and gender imbalance in schools. As Linxia Hui Autonomous Prefecture Statistical Almanac (LHAPSA, 1998-2002) data demonstrates, near the end of 1998, there were 7,845 teachers working in Linxia’s Gansu elementary schools, 3,781 in lower secondary schools, and 255 in high secondary schools. Female teachers accounted for 2710 (34.54%) in the first group; even less, 854 (22.97%), in the second group; and only 44 (17.25%) in the third group.

6-COnCLUSION

Our study clearly demonstrates that the spatial segregation of ethnic minority groups in Gansu plays a dominant role in explaining disparity in children’s education. The segregation of ethnic groups is not a simple variable; in fact, it represents the whole socioeconomic context of the region in question, including, for example, illiteracy rates among women, and government-designated poverty-stricken county status, as in our case study. This context is extremely important, particularly where minorities account for a considerable proportion of the total population, because it also signifies the level of socioeconomic exclusion of minority communities from the majority. Although China’s economic reforms in the late 1970s were accompanied by a relaxation of policies towards ethnic minorities, and by the implementation of an official policy of bilingualism in the early 1980s, which allowed for the reopening of ethnic minority schools, minority educational systems still face considerable challenges as a result of new societal needs and expectations generated by the process of modernization.

Bilingual teaching is one of the fundamental issues maintaining minority culture and its identity, particularly for some minorities – such as the Tibetans, Kazakhs, and Mongols in our case study of Gansu - that have their own languages (Ma, et al. 2001). Minorities and educators do, in fact, advocate bilingual teaching approaches, but bilingual teaching is seldom implemented and is very underdeveloped in poor areas due to a lack of trained bilingual teachers, teaching materials and curricula (Zhou, 2001). Furthermore, the long-term sustainability of some minority languages has been threatened by the fact that Mandarin, the official national language in China, has come to be perceived by an increasing number of ethnic minority group members as associated with professional and/or socioeconomic success in the transitional Chinese society. Modernization has contributed to making Mandarin even more important to the professional future of a large number of minorities. This has, in turn, impacted the extent to which cultures have been preserved among minorities. Education is, in this sense, contradictory. On one hand, it is a key factor in modernization and development (which themselves constitute a challenge to cultural
maintenance); on the other hand, it ensures the preservation of the culture, heritage, and traditional lifestyles of ethnic minorities. While the ethnic minority educational system has targeted mainly the needs of local traditional economies, the Han majority Chinese system has focused on meeting the goals of the modern national economy.

Non-schooling for girls seems to relate to financial conditions. Since the fiscal reforms of the mid-1980s, responsibilities for children’s education have been gradually decentralized, with the government’s share in total educational expenditures declining, and costs to individuals increasing. Consequently, more and more schools in China resort to collecting tuition fees from students because they face a lack of funding from their local governments. This has a direct effect on education, because it raises the cost of schooling and reinforces the disadvantages of poor rural children, particularly girls. Decentralized reforms place an immense financial burden on poor households and restrict children’s enrolment in schools, thus increasing educational inequality. At the same time, market reforms raise the value of child labour, thus enhancing its popularity in rural regions populated mostly by minorities (UNESCO 2003). This situation might be improved by a recent policy, enacted by China’s Department of Education and the Ministry of Finance, which grants tuition and miscellaneous school fee waivers to all students receiving rural nine-year compulsory education in western regions (Ding 2007). Entitlement to free textbooks for all students in financial difficulty, and living allowances for boarding students, is described in the policy as a “milestone” for compulsory education in China. Although this policy might help some children in poor families willing to send their children to school, a child’s basic education is not necessarily guaranteed by this new policy if the family remains poor, because of the high value of child labour, primarily girl labour in the transitional socialist Chinese economy and society.

The present research has some limitations. It is a study based mainly on aggregation-level data. While the use of aggregation-level data lends itself to the examination of contextual determinants of child education at the level of complete populations, it limits our ability to draw conclusions concerning factors that are responsible for variations in non-schooling rates at the individual level. Consequently, a series of questionnaire surveys that examine the perceptions of local residents, particularly minority groups, regarding access to schooling is a necessary future step in developing deeper understanding. In addition, although our research shows that the variables of school density and student/teacher ratio representing educational resources could significantly contribute to children’s schooling, particularly to girls’ schooling rates, we do not have sufficient information to enable us to calculate useful indices of accessibility of educational facilities, such as real time distance, school location, etc. For this reason, it is important to carry out a survey directly among lower secondary schools in Gansu, with the goal of collecting information such as school location, size, and capacity. The data collected from this kind of the research would help us gain a better understanding of the effects of access to children’s schooling.

Finally, at present, it would be difficult to generalize the findings of our study pertaining to the role of spatial segregation of ethnic minority groups in explaining disparity in children’s education. It is necessary to continue exploring the role of spatial distribution of ethnic minorities in areas inhabited by multiple minority groups; for example, disparity in children’s education should be investigated in other western Chinese provinces, or even in other parts of the world, such as in New Brunswick, Canada where Francophone minority accounts for 34% while Anglophone majority dominates. This future research will help us to understand more
thoroughly and more systematically the role of spatial distribution of ethnic groups with regard to inequality in education.

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REFERENCES

BADEN, S. and GREEN, C. 1994 ‘Gender and Education in Asia and the Pacific’ report commissioned by the Australian International Development Assistance Bureau
BROCK, C. and CAMMISH, N.K. 1991 *Factors Affecting Education in Six Developing Countries* London: Overseas Development Administration
CAO, H. and VILLENEUVE, P. 1997 ‘Full Time or Part Time Daycare Centers?’ (La garderie à temps plein ou à temps partiel?) *Recherches féministes : Territoires* 10(2), 49-75
CHEN, J. and FLEISHER, B. M. 1996 ‘Regional Income Inequality and Economic Growth in China’ *Journal of Comparative Economics* 22, 141-164
CHINA STATISTICAL YEARBOOK 2001(China Statistical Bureau, Beijing: China Statistics Press, 2001)
CONNELLY, R. and ZHENG, Z. 2000 ‘Determinants of Primary and Middle School Enrollment of 10-18 Years Olds in China’ *Economics of Education Review* 21, 455-470
GANSU EDUCATION YEARBOOK 2001 (Education Department of Gansu Province, Lanzhou: Education Department Press, 2001)
GANSU STATISTICAL YEARBOOK 2001 (Committee of Yearbook of Gansu Province, Beijing: China Statistics Press, 2001)
HANNUM, E. 2003 ‘Poverty and Basic Education in Rural China: Villages, Households, and Girls’ and Boys' Enrollment’ *Comparative Education Review* 47, 141-159
HANNUM, E. and KONG, P. 2002 ‘Family Sources of Education Gender Inequality in Rural China: A Critical Assessment’ paper presented at the annual meeting of the National Academy of Education (Toronto)
JOHNSON, D. G. 2000 ‘Reducing the Urban–rural Income Disparity’ *Paper no. 00-07 Office of Agricultural Economics Research, The University of Chicago*
LIANG, H. 2002 ‘The Main Problems and Reasons for Girls’ Education for Hui Minority in
Guyuan District’ *Xibei Chengren Jiaoyu Xuebao (Journal of Northwest Adult Education)* 4, 73-77 (in Chinese)


LOCKHEED, M. and VESPOOR, A. 1991 *Improving Primary Education in Developing Countries* (Toronto: Oxford University Press)

MA, J. 2000 ‘New Model for Education in Western Pastoral Areas in Gansu Province’ *Sheke Zongheng (On Social Science)* 3, 13-17 (in Chinese)


MA, L., AN, S. and LI, Y. 2001 ‘A Summary of Reform and Development of Minority Education in Gansu Province’ *Xibei Minzu Xueyuan Xuebao (Journal of Northwest Minorities University) (Social Science)* 1, 63-73 (in Chinese)


STATE COUNCIL 1994 *Guojia Baqi FUpin Gongjian Jihua (State's Anti-Poverty Program)* Chinese Central Government


UNESCO 2003 EFA (Education for All) global monitoring report 2003/4: Gender and Education for All, the Leap for Equality (Paris: UNESCO Publishing)


Economic Policy 11(4), 70-84

WORLD BANK 1995 Development in Practice: Priorities and Strategies for Education
Washington D.C.: World Bank


ZHANG, X. and FAN, S. 2004 ‘Public Investment and Regional Inequality in Rural China’ Agricultural Economics 30, 89-99

ZHANG, X. and KANBUR, R. 2005 ‘Spatial Inequality in Education and Health Care in China’ China Economic Review 16, 189-204
