SCHOOL ENROLLMENT IN IRAQ DURING THE U.S.-LED INVASION: A STATISTICAL ANALYSIS

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Abstract: Little is known about the educational consequences in Iraq during the U.S.-led invasion of 2003-2010. This study examines school enrollment based on the 2007 Iraq Household Socio-Economic Survey. There are three main findings. First, a population-weighted analysis indicates that the school enrollment rate (72.3 percent) is lower than past Iraqi rates but comparable to that in neighboring Arab countries. Second, a multivariate analysis shows that boys and rural children are far more likely to be enrolled. Last, household opinions suggest that a key reason for non-enrollment is lack of child or parent interest. An analysis of adult labor force participants suggests that the lack of interest is attributable to weak employment prospects for educated youth.

Keywords: international education; development; educational policy; Iraq

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1. INTRODUCTION

The last three decades have been tumultuous for the Iraqi education system. Although the Iran-Iraq War from 1980 to 1988 caused massive destruction, Iraq's education system flourished during the period because of continued oil revenues and Western aid (p. 5, UNESCO, 2003). Until just prior to the Gulf War of 1990 to 1991, the Iraqi education system was considered the Arab region's jewel—boasting an alleged 100 percent gross enrollment rate and providing free education and materials to students (UNESCO, 2003). During and after the Gulf War, however, the Iraqi education system deteriorated because stringent economic sanctions caused a drop in the oil revenues that supported education. Emerging evidence indicates that the third war in three decades—the U.S. led invasion from 2003 to 2010—has left behind a dilapidated education system affected by safety concerns, rising costs, and acute shortages of teachers and learning materials (Government of Iraq, 2008; UNESCO, 2004).

Confronted with a debilitated education system, how have Iraq's households responded with respect to the schooling of their children? In this study, I use statistical methods to examine school enrollment by using the 2007 *Iraq Household Socio-Economic Survey* (henceforth IHSES)— the first nationally representative data on households since 1988. There are three main parts in this study. First, a population-weighted analysis is conducted to determine the school enrollment rates and numbers among children in the 6-17 age-group. Second, a multivariate analysis of the correlates of school enrollment addresses the child, household and regional characteristics associated with school enrollment. Next, an analysis of Iraqi household opinions provides insight into the reasons for non-enrollment, which can be broadly categorized as "unable to enroll" and "uninterested in schooling"; there is an

additional analysis to assess the role of educational attainment on adult labor market outcomes.

In this first and (to my knowledge) only statistical analysis of education in Iraq in the 21st century, I provide a basic foundation for further research on policies for increasing school enrollment that may ultimately expedite the recovery of Iraq's education system and of the overall society and economy. Broadly, this study contributes to the limited literature on the effect of wars on education (Blattman and Miguel, 2010).[1]

2. BACKGROUND

Drawing from Farouk-Sluglett and Sluglett (2001), Davis (2005), Davis (2010), Santisteban (2005), and documents from the Iraqi government (Ministry of Planning and Development Corporation, 2008), this section presents the relationship between education and social change in Iraq from 1920 to 2007.

2.1 Social Change and Education in Iraq

The modern state of Iraq was created in 1920 as part of a peace settlement after World War I. The state was the result of the victorious Allies dividing the Arab provinces of the former Ottoman Empire. The new entity had never existed as a nation-state in the past, and there was considerable foreign involvement in the Iraqi political, social, and economic system following the discovery of Iraqi oil in 1927 (Farouk-Sluglett and Sluglett, 2001). For example, Britain imported King Faysal of Mecca to ensure that the concession for oil exploration and exploitation was given to the Iraq Petroleum Company—a conglomerate of

[1] In a survey of the social science literature on the consequences of war, Blattman and Miguel (p. 42, 2010) observe, "The leading question is not whether wars harm human capital stocks, but rather in what ways, how much, for whom, and how persistently—all crucial questions for understanding war's impacts on economic growth and inequality, as well as priorities for postconflict assistance."

British, Dutch, French, and American oil interests. In addition, Britain maintained military bases in Iraq. A monarchy, "suitable" tribal leaders, and the unrepresentative government were supported by the foreign powers. Most Iraqis viewed Faysal's monarchy as an agent of British rule and his monarchy lacked legitimacy throughout the rule (Davis, 2010). Between 1927 and 1957, the shares of revenues benefitted a small number of elites while the majority of the Iraqi population lived in abject poverty and without access to basic services such as education.

In 1958, a disaffected group of military officers led a revolution that was also supported by liberal democrats, Arab nationalists, Kurdish nationalists in the north, and the popular communists. Weeks after the revolution, however, serious political differences began to emerge among the supporters of the revolution. In this Cold War era, America was particularly concerned about the supposed communist leanings of key military leaders. With the support of the American Central Intelligence Agency, the Arab Socialist Ba'ath (meaning "resurrection" or "renaissance" in Arabic) party emerged in post-revolutionary Iraq and went on to have the most long-term success. The basic assumption of Ba'athism is that there is a single Arab nation that has been artificially divided initially by the Ottoman Empire and later by European and American imperialists and by Zionist forces.[2] Ba'athism is therefore a variety of pan-Arab nationalism, which has three main goals: unity of the Arab nation,

[2] Zionism is a Jewish nationalist or national liberation political movement (Lockman, 2001). It is based on the historical ties and religious traditions linking the Jewish people to the Land of Israel. Within the context of the Arab-Israeli conflict, Zionism has been a major influence on the military and economic tactics of the Israeli government. In 1975, the United Nations General Assembly designated Zionism as "a form of racism and racial discrimination." The resolution was repealed in 1991. Critics of Zionism argue that it is a movement and system that promotes apartheid and ethnocentrism. In Iraq, the Ba'ath Party punished those thought to have Zionist affiliations (Davis, 2010). In 1969, for example, fourteen Jews were hanged in Baghdad's Liberation Square for being "Zionist spies". Nine of the victims were young or elderly Iraqi Jews.

freedom from imperialism and Zionism, and socialism (a state-directed economic development supported by a mixed economy).

With membership peaking at less than 1,000 in the early 1960s, the Ba'ath party was viewed as a brutal regime for killing, torturing, and imprisoning thousands of communists, reformers, and democracy activists. After attempting an unsuccessful coup in 1963, the Ba'ath Party and a successful coup in 1968 and assumed power in the 1970s. No political opposition was tolerated. Saddam Hussein assumed leadership of the Ba'ath Party and the presidency of Iraq in 1979.

Saddam Hussein's arrival coincided with the establishment of the Islamic Republic of Iran—a nation with political, social, and economic commitments that were opposed by Western nations. As tensions grew between Iraq and Iran, much of the world threw its support behind Iraq. In addition, the 1970s was a period of significant economic gains for the Iraqi state because the nationalization of oil in 1973 resulted in enormous revenues. International support and a large population (almost 13 million by the end of the decade) further contributed to Iraq becoming a major regional economy with large imports of Japanese and Western consumer goods, industrial and infrastructural equipment, and military hardware (Farouk-Sluglett and Sluglett, 2001). Oil revenues also allowed the Ba'ath Party to create organizations for women, students, and culture. The political, social, and economic gains of the 1970s translated to considerable improvements in the education sector. In particular, Saddam Hussein's Ba'ath government further spread its messages of unity, freedom, and socialism by using oil revenues to meet basic needs, including the need for education. As already mentioned, the Iraqi education system during this time performed strongly despite the ongoing war with Iran because of the oil revenues and strong international support.

The Iraqi invasion of Kuwait and the subsequent Gulf War of 1991 marked the weakening of the Iraqi economy and education system. By some estimates, the bombings devastated the infrastructure and industrial sector, forcing Iraq back to economic levels of the 1960s (Davis, 2005). Economic sanctions caused a massive decline in oil revenues and in all forms of external assistance except for basic food and medicine. Living standards deteriorated because the Iraqi government could no longer afford to maintain basic systems for electricity, water, sanitation, and healthcare. The ensuing poverty and dependence on traditional institutions (tribes, ethnic and religious groups) fueled sectarian violence between the Sunni, Shia and Kurds, causing further damage to Iraq's already fragile economy and education system.

Systematic data on the education system during the late 1990s and 2000s are unavailable, but anecdotal evidence suggests that the decline of the education system continued as sanctions mounted and conflicts escalated. For example, in 2002, UNESCO visited 473 schools and reported that just 32 percent had a satisfactory water supply, and 52 percent of toilets did not meet basic standards of hygiene (p. 26, UNESCO, 2003). UNESCO also noted that because of the absence of school janitors, large mounds of garbage were typical in schools (some left by neighboring households). Upon observing the number and quality of existing teachers, UNESCO concluded that the majority of qualified teachers had left Iraq. As for the labor market, Davis (2010) reports that unemployment has been as high as 60 percent to 70 percent among some segments of Iraqi youth.

As mentioned above, anecdotal evidence indicates that the Iraqi economy and education system continued to deteriorate after the U.S.-led invasion in 2003. Evidence about this period is just beginning to emerge. According to Santisteban (2005), the U.S.-led Coalition Provisional Authority's first actions in relations to education were to remove

pictures of Saddam Hussein from school buildings and his statements from textbooks. Also removed were content influenced by Baathist ideology. Within the development community, it is anticipated that rebuilding Iraqi education to an internationally satisfactory level will take many years and great resources because of political instability, the abolishment of a common education curriculum in 2003, and confusion about the legality of the U.S.-led Coalition's reconstruction efforts in education (p. 68, Santisteban, 2005).

2.2 Structure of the Iraqi Education System

During the turmoil of the invasion, the basic structure of Iraq's formal education system has remained intact and consists of four levels: primary, intermediate secondary, preparatory/vocational secondary, and higher education. Schooling is compulsory between the ages of 6 to 14. Students are required to attend primary schools for six years and intermediate secondary schools for three years. Upon completing intermediate secondary education, students may proceed to either preparatory secondary or vocational secondary institutions for three years from the ages of 15 to 17. After completing preparatory secondary school (and occasionally vocational secondary education), students may proceed to one of Iraq's 28 public or private universities. Unlike during the pre-Gulf-War period, tuition and fees are charged for education at all levels (p. 73, Government of Iraq, 2008).

2.3 Regional Characteristics

As Figure 1 shows, Iraq is divided into 18 governorates or provinces. The *2008 National Report on the Status of Human Development* provides rankings of the governorates based on a human development index that includes life expectancy, education, and per-capita income (p. 25, Government of Iraq, 2008). The three governorates of the Kurdistan region

in the north and northeast ranked highly in terms of human development, with As Sulaymaniyah first, Arbil second, and Dahuk fourth. This achievement is noteworthy because the Ba'ath government withheld development support for Kurdish governorates because of differences in ethnic, linguistic, religious, and political preferences (Farouk-Sluglett and Sluglett, 2001).[3] The central governorate of Baghdad ranked tenth, while other key governorates—Al Anbar in the east and Al Basrah in the southeast—ranked third and fifth. The governorates with the smallest populations—Maysan, Al Muthanna, and Al Qadisiya—came last in terms of human development.

[Figure1 about here]

The human development rankings are correlated with economic and political stability and security (Lanier and Roshan, 2005). During the U.S.-led invasion, the Kurdish governorates of Dahuk, Arbil, and As Sulaymaniyah in the north were the only governorates rated as "secure" and "under provincial Iraqi control" by U.S. military; they even attracted foreign investment in the oil industry. Regions considered "partially ready for transition" include Ninawa, Tamim, Salahaddin, Diyala, Babil, Karbala, An Najaf, Al Qadisiya, Wasit, and Misan. Included in the regions considered "not ready for transition" because of a disproportionate share of insurgent fighters were located in Baghdad (particularly in impoverished areas such as Sadr city), Al Anbar (especially in the cities of Fallujah and Ramadi), and Al Basra (considered Iraq's most bloody province). The much-scrutinized surge of American troops in 2007 was intended to provide additional security in Baghdad and Al Anbar. During the invasion, the total number of US troops in Iraq peaked at 168,000 in October 2007 (p. 49, Dale, 2008). Existing accounts of stability and security do not mention the consequences for schooling.

[3] For example, communism has traditionally enjoyed strong support in the Kurdish governorates (Farouk-Sluglett and Sluglett, 2001).

3. DATA

The Iraq Household Socio-Economic Survey (IHSES) is an initiative of the Iraqi Ministry of Planning and Development Cooperation undertaken in 2006 as part of its Household Survey and Policies for Poverty Reduction Project, which was financially and technically supported by the World Bank.[4] As mentioned earlier, the 2007 IHSES is the first nationally representative household survey since 1988 and contains socio-economic data (family member records, food rations and consumption, housing, education, health, recreational activities, and recent work activities) and asset ownership data. Interviewees were not asked about the characteristics of local schools; consequently, this study cannot take into account school-level determinants of enrollment such as class size, teacher characteristics, sanitation conditions, books, supplies, and distance to school. Another possible data limitation is the inability to collect data on internally displaced children, who typically reside in temporary fixtures inside inaccessible refugee camps. Even if data is collected on such populations, the accuracy of the sample weights is usually suspect. In a post-war society like Iraq, the issue of almost 2.8 million internally displaced children and adults raises major policy concerns (UNHCR, 2008).[5]

A household response rate of 98.6 percent resulted in a final sample size of 17,822 households and 127,189 individuals. The IHSES team constructed an "importance weight"

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[4] Source: p. 1. IHSES Survey Methodology. The project has been led by the Iraqi Poverty Reduction Strategy High Committee, a group that includes representatives from Parliament, the prime minister's office, the Kurdistan Regional Government, and the ministries of Planning and Development Cooperation, Finance, Trade, Labor and Social Affairs, Education, Health, Women's Affairs, and Baghdad University.

[5] The UNHCR reported that in January 2010, Iraq had over 2 million refugees (mostly from Iran, Turkey, and the Palestinian territories), asylum-seekers, and internally displaced peoples UNHCR Global Appeal, 2010-11; http://www.unhcr.org/4b03cd879.html. Another group likely to not be represented are slum dwellers. According to UN Habitat, approximately 10 million Iraqis live in such areas (UNHCR, 2008).

for different segments of the population in order to ensure national representativeness. By using this weight, I am able to provide nationally representative estimates of schooling among children living in households. According to a weighted analysis, Iraq had 30.1 million people in 2007, of whom 5.2 million are in the 0-5 age-group, 8.9 million are in the school-going 6-17 age-group, 13.9 million are in the working age-group of 18-55, and 2.1 million are in the 56 and above age-group.

Figure 2 illustrates the years of educational attainment for different birth-cohorts of Iraqis. There is a slow rise in attainment among those who were school before the Ba'ath party came into power in the 1970s. Next, there is a substantial jump in attainment for Iraqis in the 1956-60, 1961-65 and 1966-70 age-cohorts who benefited most from educational development and expansion following the increased oil revenues and Western support. For cohorts born in 1971-75 to 1986-90, attainment levels start to dip partly because of exposure to the Iran-Iraq War and the first Gulf War; the drop in attainment is larger for males, possibly because boys were more involved in the wars than girls.

[Figure 2 about here]

Curiously, Figure 2 challenges the narrative that Iraq made large gains educationally during Saddam Hussein's early reign. Educational attainment reached a peak at 8.3 years for the 1966-70 birth cohort who started their schooling 9 to 13 years before Saddam Hussein came to power in 1979. There are two possible explanations for this phenomenon. First, claims about educational gains in the Saddam-era were exaggerated by his regime. Second, educational attainment may have increased further during Saddam's rule but many of the

highest educated then left Iraq. In reality, it is likely that both the exaggerated attainment numbers and brain drain explanations are valid.[6]

4. ENROLLMENT RATES AND NUMBERS

The 2007 IHSES survey states that "any individual is considered as enrolled at schools when he reaches the age of (6) and he is registered in a private or public educational institution, inside or outside Iraq, for a period of not less than one year, and he is enrolled or expected to at a school for half year of his registration period or longer period." Figure 3 presents the enrollment rates for children in the 6-17 age-group. Enrollment rates rise rapidly from age 6 (69.6 percent) and peak at age 9 (92.0 percent). Enrollment rates then gradually fall at the transition from primary to secondary school at age 14 (69.1 percent) and rise slightly again towards the end of secondary school at age 17 (72.4 percent). For any given age, boys have higher enrollment rates than girls; the gender gap begins to widen from age 11. The overwhelming majority of children attend public schools (99.3 percent).

[Figure 3 about here]

Overall, the analysis indicates that of Iraq's 8.90 million children in the 6-17 age-group, 6.44 million or 72.4 percent are enrolled in school.[7] As a country, the Iraqi school enrollment rate is comparable to that of Lebanon (78.0 percent), Turkey (71.1 percent), Iran (73.2 percent), Jordan (78.7 percent), Syria (65.7 percent), and Egypt (76.4 percent). Iraq's enrollment rate is slightly less than in another conflict-ridden area in the Arab world—the

[6] I am grateful to an anonymous review for pointing out this pattern that contradicts the narrative about large educational advances made during Saddam's regime.
[7] The child labor (that is, those either presently employed or seeking work) rate among the 6-17 age-group is 6.4 percent.

Occupied Palestinian Territory (78.3 percent).[8] Thus, Iraq is no longer the jewel of the Arab world but fares similarly to neighboring countries in terms of school enrollment rates.

5. THE CORRELATES OF SCHOOL ENROLLMENT

In this section, I explore the child, household, and regional characteristics that are correlated with school enrollment. The analysis involves a binomial probit regression model with the dependent variable *SCHOOL*, which equals 1 if child *i* is enrolled in school or 0 if child *i* is not enrolled in school. The probit regression model can be presented in the following form:

$$\Pr(SCHOOL_i = 1 \mid \mathbf{X}) = F(\mathbf{X}_i'\beta)$$

In the model, **X** is a vector of child, family, and regional characteristics, and β is a vector of parameters to be estimated. The characteristics (**X**) are based on a rich social science literature on the correlates of schooling (for reviews, see Glewwe and Kremer, 2006; Hannum and Buchmann, 2004).

Child characteristics include dummy variables for the child's gender (1 if female, 0 if male), age (dummy variables for each age), and health (1 if child suffers from a chronic disease or illness or both, 0 otherwise). In the Iraqi context, the health variable permits inquiry into how war indirectly affects schooling by causing poor health.[9]

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[8] These are figures for the year 2007 and have been obtained from the *2009 Human Development Report* (United Nations, 2009), which classifies countries as having high human development (83 countries, including Lebanon and Turkey); medium human development (74 countries, including Iran, Jordan, Syria, Occupied Palestinian Territories, and Egypt); and low human development (the poorest Sub-Saharan African countries and Afghanistan). Because the *Human Development Report* predates the release of the Iraq Socioeconomic Survey, Iraq has not been classified into any of the three categories.

[9] Chronic diseases are defined by IHSES as "long-term diseases such as heart problems and hypertension, diabetes ... etc." IHSES defines disability as "the weakness or lack of physical or mental ability, such as amputation of hands or legs, half-term paralysis or impairment of physical or mental disability".

Family characteristics include the gender of the household head (1 if head is female, 0 otherwise), number of adults residing in the household, number of children (0-17 age-group) residing in the household, and socioeconomic status (1 if the per-capita income is at or below a poverty line determined by the IHSES team, 0 otherwise). Regional characteristics include whether the household is an urban or rural region (1 if rural, 0 if urban) and the governorate in which the household falls.

Table 1 presents the summary statistics for the explanatory variables using the sample of children in the 6-17 age-group. The mean of the illness dummy variable indicates that 11.6 percent of children suffer from illness, disability, or both. Male household headship is the norm as only 8.0 percent of household heads are female. On average, there are 4.6 adults and 4.2 children in each household. According to IHSES and World Bank constructed poverty line, 25.9 percent of children live in households that are at or below poverty line. Iraq remains a rural society, with 67.5 percent of all children residing in rural households; this number partly reflects the fact that Iraqis have retreated from conflict-ridden urban centers. At 21.9 percent, Baghdad has the largest share of children of school-going age. Ninawa, Arbil, and Basrah have another quarter of the total share. The remaining half is evenly distributed in the other fourteen governorates.

[Table 1 about here]

Table 2 presents the probit regression results of school enrollment. The sub-sample for this analysis includes children in the 6-17 age group. All coefficients are statistically significant at the 1 percent level. In other words, each of the child, household, and regional characteristics are correlated with school enrollment.

[Table 2 about here]

The coefficients for child characteristics show large differences across gender, age, and child health. Holding all other characteristics constant, a girl is 12.9 percent less likely to be enrolled in school than a boy. This is consistent with the sociological literature from Iraq and the Arab world generally (Al-Ali, 2007; Lewis and Lockheed, 2006), Iraqi households have a strong preference for educating sons over daughters.

Age has a strong non-linear association as enrollment likelihoods rise quickly for children of primary school age but fall for children of secondary school age. For example, compared to a 6-year-old child, a child of age 7 is 18.8 percent more likely to be enrolled in school, all else being equal. However, compared to a child of age 6, a child of age 14 is 9.9 percent less likely to be enrolled. Similarly, a child of age 17 is 32.4 percent less likely to be enrolled, holding all other factors constant.

As for child health, a child who has a chronic illness or disability is 8.7 percent less likely to be enrolled in school than a child who does not, holding all other characteristics constant. Thus, chronic illnesses and disabilities, the incidences of which have been exacerbated by the war, are negatively associated with school enrollment in Iraq.

The results on household characteristics in Table 2 show that household composition and socioeconomic status are statistically associated with school enrollment. A child in a household with a female household head is 5.4 percent less likely to be enrolled than a child in a household with a male household head, holding all other characteristics constant. A likely explanation is that female-headed households may not have adult males for assistance, and may therefore need children to manage household affairs or engage in child work. Such responsibilities reduce a child's likelihood of being enrolled in school.

The presence of each additional adult reduces a child's likelihood of enrollment by 0.3 percent; this result is somewhat unusual because in most studies of other countries, the

presence of adults reduces the work burden of children (Edmonds, 2008). A possible explanation is that children help take care of the adults. The presence of each additional child reduces the likelihood of enrollment by 1.4 percent; this finding is consistent with the theoretical and empirical literature on the tradeoff between the number and education of children (Becker and Lewis, 1973; Glewwe and Kremer, 2006).

A child from a poor household is 12.5 percent less likely to be enrolled in school than one who is in a wealthier household, holding all else constant. Such socio-economic disadvantage is consistent with virtually every study on school enrollment.

In terms of community characteristics, Table 2 shows that a child residing in a rural area is 13.6 percent more likely to be enrolled in school than a child residing in an urban area, holding all other characteristics constant. This finding contradicts the worldwide research on school enrollment but is not surprising for Iraq, given the greater extent of unrest in urban areas.

Compared to a child residing in Baghdad, a child in all governorates except Maysan are more likely to be enrolled, assuming all child, household and other community characteristics are similar. Children residing in Kurdish regions of Dahuk, Arbil, and As Sulaymaniyah enjoy an enrollment advantage over children in Baghdad and most other parts of Iraq. Surprisingly, children in the highly insecure Al Anbar governorate have a relatively high likelihood of being enrolled in school. One reason for the weak relationship between the economic and political stability of a governorate and school enrollment may be troop presence, on the assumption that more troops may project safety and encourage households to send children to school.

6. REASONS FOR NON-ENROLLMENT AND LACK OF INTEREST

According to the 2007 IHSES, an estimated 2.46 million children are not enrolled in school in Iraq. For an estimated 1.58 million unenrolled children, however, Iraqi households provide a range of reasons. For the remaining unenrolled children, the IHSES does not have the reasons for non-enrollment; the IHSES does not explain whether this is because of households failing to answer the question, or the IHSES team deciding to not ask the question. Table 4 presents a breakdown of the responses across three categories: "no reason provided," "unable to enroll," and "uninterested in enrolling".

[Table 3 about here]

Reasons that fall under the "unable to enroll" category include no school, lack of sanitary facilities, travel difficulty, not having a female teacher, not having a teacher at all, inability to afford educational expenses, child work commitments with the family or someone else, disability/illness, marriage, social reasons, loss of documents, being discharged from school, end of education (meaning that the child completed the highest level of schooling desired by the household, or the level of schooling available in the schools), and other reasons. According to Table 3, households cite social reasons (8.1 percent) as the major rationale for not being able to enroll, which may suggest that the child is of a different religion, social class, or sect than the other children at the school. In terms of educational policy interventions, the responses indicate that building schools (0.8 percent), improved transportation arrangements to and from school (2.4 percent), and lowering the cost of schooling (4.4 percent) may raise enrollment rates. In addition, the fact that households cite child work for the family or someone else (4.8 percent) suggests that school enrollments may

be increased using a conditional cash transfer scheme—where households are financially compensated for enrolling children in school.[10]

For an estimated 942,300 unenrolled children in Iraq, households report a lack of interest in schooling. It is worth speculating about the possible explanations for being "uninterested in schooling" other than the reasons listed in the 2007 IHSES. One possible explanation is that the exodus of middle-class and elite families from Iraq has left a population that is less securely oriented to education. Another possible explanation is that educational quality has deteriorated to the extent that educational attainment no longer results in improved skills. Consistent with the earlier discussion, the severe deterioration of school infrastructure and staff may have lowered school quality to levels that are no longer acceptable to parents. Unfortunately, there is no way of investigating changes in school quality using IHSES data.

There are a series of labor market explanations for the lack of interest in schooling. It may be that the Iraqi expectations for jobs have been permanently affected by the cronyism of Saddam's reign—where loyalties and not degrees or skills mattered in securing jobs. Another possible explanation is that there is a serious shortage of jobs requiring advanced skills, such that households believe that there are minimal or negligible labor market benefits to schooling (for a conceptual framework, see Jensen, 2010). To assess household expectations from education, we can use the IHSES sample of adults to assess the relationship between educational attainment and current employment outcomes of adults. The standard approach is to estimate a rate of return to educational attainment (Psacharopoulos and Patrinos, 2004). Because the IHSES data has highly inconsistent data on earnings, I pursue an alternative labor market outcome variable: employment, which is 1

[10] For a discussion of the potential and pitfalls of conditional cash transfer schemes, see Reimers et al. (2006).

if the person is employed, and 0 if the person is unemployed but looking for work. The analysis dictates that the sub-sample is restricted to labor force participants—those who are either employed or looking for employment. The age range of 18-55 is based on the age of adulthood and public sector retirement age. To compare outcomes across age, I include four cohort dummy variables: age 18-24 (reference group_, age 26-35, age 36-45, and age 46-55. To address the possibility of gender differences, separate regressions are run for men and women.[11] The probit regression model can be presented in the following form:

$$\Pr(EMPLOYED_i = 1 \mid \mathbf{X}) = F(\mathbf{X}_i'\beta)$$

In the model, $\mathbf{X}$ is a vector of personal and regional characteristics, and β is a vector of parameters to be estimated.

Table 4 presents the results from a binomial probit regression analysis of educational attainment and likelihood of being employed versus unemployed. Two key patterns emerge. First, Iraqi adults with post-primary education are less likely to be employed than those without primary education. For example, holding all other characteristics constant, men and women with secondary education attainment are 0.2 percent 8.3 percent less likely to be employed than those without primary education. Second, youth are considerably less likely to be employed than older cohorts. For instance, compared to adults in the age-cohort of 35-46, male and female youth are 9.1 percent and 12.7 percent less likely to be employed, holding education and other factors constant. In reality, Iraqi children and households might expect more economic and political chaos that further reduces the labor market advantages of formal education. For future research, there are several extensions to the labor market analyses conducted in this section, such as the relationship between education and formal/informal sector employment or unemployment duration.

[11] Labor force participation rates in Iraq are 87.4 percent for males and 15.9 percent for women.

[Table 4 about here]

7. CAVEATS AND FUTURE RESEARCH

As mentioned earlier, 2.8 million people in Iraq are internally displaced and not living in households. Even though the IHSES is nationally representative, there is the possibility that the sample weights for the internally displaced are inaccurate, such that they underweigh the actual shares. Consequently, several of the estimates in this study are likely to be biased. First, the national school enrollment rate is likely to be downward biased because the enrollment rates of refugee and homeless children are likely to be lower. Second, the coefficient for female is likely to be downward biased because girls in unsafe environments (which is common among the displaced) are even less likely to enroll when compared to girls residing in households. Third, the coefficient for poverty is also likely to be downward biased because the internally displaced population makes up a disproportionate share of the poor nationally.

Inaccurate weights and omissions of internally displaced populations are also likely to cause biases in the analysis of reasons for non-enrollment, such that the responses for non-enrollment and lack of interest may be substantially different for refugee and homeless populations. In particular, the current estimates for "unable to enroll" category is likely to be downward biased because a significant share of the refugee and homeless populations would cite reasons such as 'no school', 'lack of sanitary facilities', 'travel difficult or unsafe', 'no female teacher', 'no teacher at all', 'cannot afford expenses', 'child work', 'disability', and 'loss of documents'.

This is a descriptive and preliminary analysis, such that the methodologies adopted provide suggestive evidence though not necessarily definitive proof on the causal effects of

child, household, school, regional, and labor market characteristics on schooling. For future research, a key goal is to identify the causal effect of war on schooling in Iraq. Existing qualitative and quantitative research are useful guides. Based on fieldwork, a qualitative research approach may involve the collection and interpretation of household and school testimonies on the effect of war (Fujii, 2010). A quantitative research approach may use advanced econometric techniques, such as exploiting variations in the timing or intensity of local conflicts (for example, Akresh et al., 2011; Akresh and de Walque, 2008; Bundervoet et al., 2009; Shemyakina 2011). Such econometric analyses, however, require merging the IHSES data with publicly unavailable longitudinal data of local conflicts in Iraq.

8. CONCLUSIONS

This study examined school enrollment among children residing in households in Iraq during the U.S.-led invasion. There are several findings. First, a population-weighted analysis indicates that the school enrollment rate is 72.3 percent among the 8.9 million children in the 6-17 age-group. This enrollment rate is comparable to neighboring countries but far lower than the full enrollment rates that were reported in the 1980s.

A second conclusion is that a multivariate analysis of the correlates of school enrollment shows significant differences by children's gender, socioeconomic status, and region. In addition, a strong pro-male bias towards schooling persists and children from poor households are far less likely to be enrolled. Regionally, children in Kurdish governorates are more likely to be enrolled than children in non-Kurdish regions; this result is consistent with the relative peace and prosperity experienced in Kurdish regions. Partly because of the urban nature of conflict in Iraq, rural children are more likely to be enrolled than urban children. That there is surprisingly little relationship between level of security and

enrollment draws attention to providing policy assistance to relatively stable governorates such as Maysan, An Najaf, and Ninawa. Therefore, policy interventions should prioritize girls, the poor, and children in regions with high and medium levels of stability. Topics for future research include the precise reasons behind the pro-male gender gaps (such as stigma, cost, and weak labor market prospects), and the small differences in enrollment between highly stable and unstable regions of Iraq.

A third conclusion is that Iraqi households report that education policy (namely school construction, provision of safer transportation, lower-fee schools, and conditional cash transfers) may result in slight increases in enrollment, but the main reason for non-enrollment is lack of interest in schooling among children and households. An analysis of Iraqi men and women in the labor force reveals that educational attainment is typically associated with a lower likelihood of being employed, and that youth are significantly less likely to be employed than non-youth. Taken together, a key reason for the lack of interest in schooling is that educated youth face unusually weak labor market prospects in Iraq.

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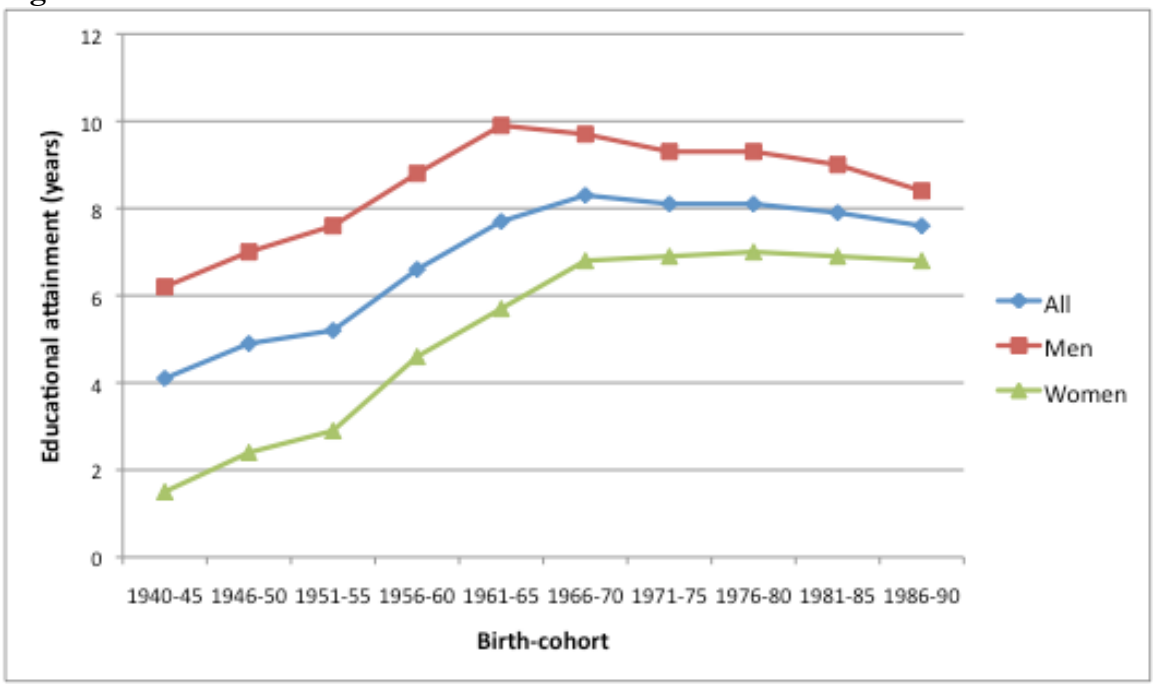
Figure 1: Governorates of Iraq

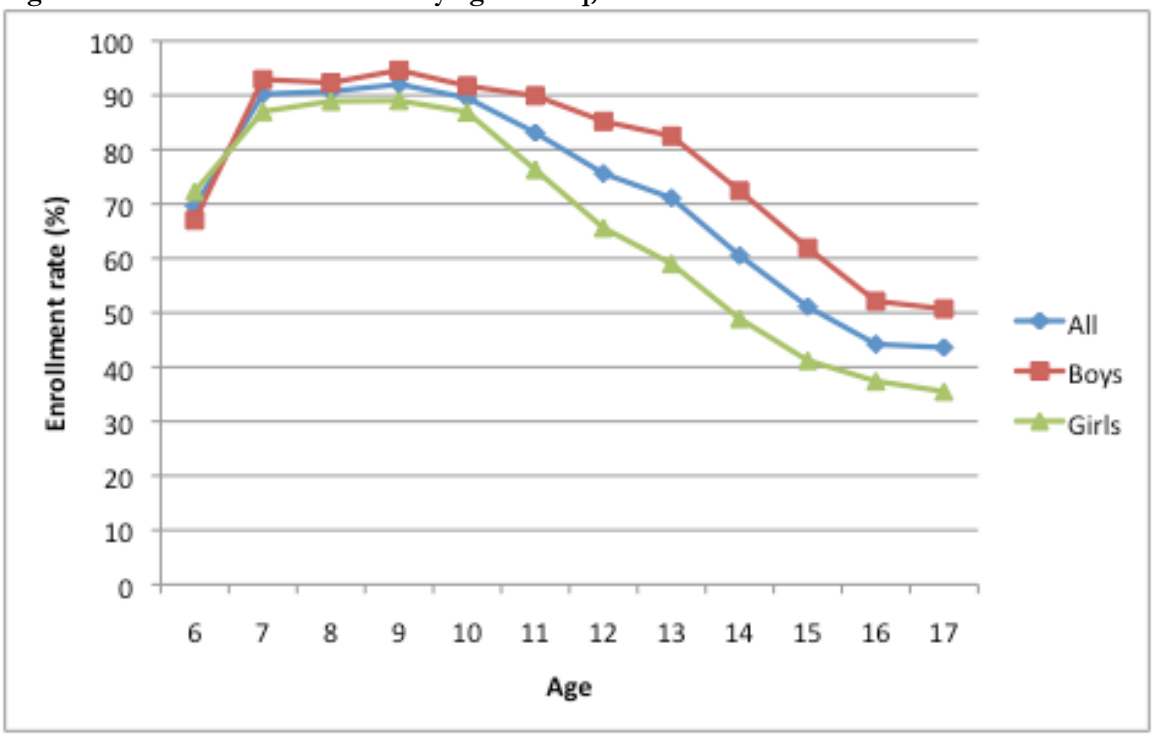
Source: Davis (2005)

Figure 2: Educational attainment across birth cohorts



Source: Iraq Household Socio-Economic Survey 2007.

Figure 3: School enrollment rates by age in Iraq, 2007



Source: Iraq Household Socio-Economic Survey 2007.
Notes: Values are weighted and therefore nationally representative.

Table 1: Summary statistics, 6-17 age-group

Variable	Variable type	Mean	Standard deviation
Female	Dummy	0.487	(0.447)
Age 6	Dummy	0.089	(0.285)
Age 7	Dummy	0.089	(0.285)
Age 8	Dummy	0.091	(0.287)
Age 9	Dummy	0.086	(0.280)
Age 10	Dummy	0.086	(0.280)
Age 11	Dummy	0.079	(0.269)
Age 12	Dummy	0.085	(0.278)
Age 13	Dummy	0.079	(0.270)
Age 14	Dummy	0.078	(0.267)
Age 15	Dummy	0.075	(0.263)
Age 16	Dummy	0.083	(0.275)
Age 17	Dummy	0.082	(0.274)
Illness/disability	Dummy	0.116	(0.320)
Female household head	Dummy	0.080	(0.272)
Number of adults in household	Discrete	4.62	(2.65)
Number of children in household	Discrete	4.24	(2.47)
Poor household	Dummy	0.259	(0.438)
Rural	Dummy	0.675	(0.469)
Baghdad	Dummy	0.219	(0.413)
Dahuk region	Dummy	0.030	(0.172)
Ninawa region	Dummy	0.103	(0.304)
As Sulaymaniyah region	Dummy	0.051	(0.221)
Arbil region	Dummy	0.084	(0.278)
Diyala region	Dummy	0.041	(0.198)
Al Anbar region	Dummy	0.052	(0.223)
Babil region	Dummy	0.055	(0.228)
Karbala region	Dummy	0.032	(0.175)
Wasit region	Dummy	0.034	(0.180)
Salahaddin region	Dummy	0.041	(0.199)
An Najaf region	Dummy	0.037	(0.189)
Al Qadisiya region	Dummy	0.034	(0.181)
Al Muthanna region	Dummy	0.024	(0.152)
Thiqar region	Dummy	0.056	(0.231)
Maysan region	Dummy	0.034	(0.185)
Basrah region	Dummy	0.071	(0.256)
N	38,066		

Notes: ** represent statistical significance at the 1 percent level. Values are weighted and therefore nationally representative.
Source: Iraq Household Socio-Economic Survey 2007.

Table 2: Binomial probit regression results--Likelihood of school enrollment in Iraq, 6-17 age-group

	Coefficient	Standard error	Marginal effect × 100
Child characteristics:			
Female	-0.434**	(0.001)	-12.9
Age 6	Reference		
Age 7	0.886**	(0.002)	18.8
Age 8	0.914**	(0.002)	19.1
Age 9	1.001**	(0.002)	20.1
Age 10	0.808**	(0.002)	17.6
Age 11	0.505**	(0.002)	12.4
Age 12	0.225**	(0.002)	6.2
Age 13	0.011**	(0.002)	0.3
Age 14	-0.305**	(0.002)	-9.9
Age 15	-0.595**	(0.002)	-20.6
Age 16	-0.804**	(0.002)	-28.6
Age 17	-0.901**	(0.002)	-32.4
Illness/disability	-0.271**	(0.001)	-8.7
Household characteristics:			
Female household head	-0.171**	(0.002)	-5.4
Number of adults in household	-0.011**	(0.000)	-0.3
Number of children in household	-0.047**	(0.000)	-1.4
Poor household	-0.394**	(0.001)	-12.5
Regional characteristics:			
Rural	0.435**	(0.001)	13.6
Baghdad	Reference		
Dahuk region	0.641**	(0.003)	14.5
Ninawa region	0.047**	(0.001)	1.4
As Sulaymaniyah region	0.741**	(0.002)	16.2
Kirkuk region	0.199**	(0.002)	5.5
Arbil region	0.549**	(0.002)	13.1
Diyala region	0.781**	(0.003)	16.6
Al Anbar region	0.636**	(0.002)	14.6
Babil region	0.281**	(0.002)	7.5
Karbala region	0.204**	(0.003)	5.6
Wasit region	0.135**	(0.002)	3.8
Salahaddin region	0.118**	(0.002)	3.4
An Najaf region	0.080**	(0.002)	2.3
Al Qadisiya region	0.165**	(0.002)	4.6
Al Muthanna region	0.238**	(0.003)	6.4
Thiqar region	0.088**	(0.002)	2.6
Maysan region	-0.378**	(0.002)	-12.6
Basrah region	0.251**	(0.002)	6.8
Constant	0.705**	(0.002)	
Predicted likelihood of being enrolled (%)			77.6
N	38,066		
Pseudo R-squared	0.2267		

Source: Iraq Household Socio-Economic Survey 2007.
Notes: ** represent statistical significance at the 1 percent level. Values are weighted and therefore nationally representative.

Table 3: Reasons for non-enrollment, 6-17 age-group

Reasons for non-enrollment	Share of unenrolled children	Number of children
No reason provided:	*35.7%*	*879,158*
Unable to enroll:	*25.9%*	*638,047*
No school	0.8%	19,765
Lack of sanitary facilities	<0.1%	486
Travel difficult or unsafe	2.4%	58,915
No female teacher	0.1%	2,580
No teacher at all	0.1%	2,672
Cannot afford expenses	4.4%	109,324
Work for family	4.7%	115,249
Work for someone else	0.1%	3,057
Illness/disability	1.4%	34,877
Marriage	0.9%	21,284
Social reasons	8.1%	198,091
Loss of documents	0.1%	1,265
Discharged from school	0.5%	11,334
End my education	0.1%	1,493
Other	2.3%	57,655
Uninterested in enrolling:	*38.3%*	*942,300*
Family not interested	13.5%	332,136
Child not interested	24.8%	610,164
Total unenrolled	*100%*	*2,459,505*
N	10,588	

Source: Iraq Household Socio-Economic Survey 2007.
Notes: Values are weighted and therefore nationally representative. Numbers do not add to 100.00 because of rounding.

Table 4: Binomial probit regression results--Likelihood of being employed in Iraq, labor force participants in 18-55 age-group

	Males			Females		
	Coefficient	Standard error	Marginal effect × 100	Coefficient	Standard error	Marginal effect × 100
Personal characteristics:						
Below primary	Reference			Reference		
Primary	.037**	(.002)	.61	-.183**	(.007)	-.029
Intermediate	-.059**	(.002)	-1.0	-.732**	(.008)	-.161
Secondary	-.014**	(.003)	-.23	-.444**	(.008)	-.083
Technical	.087**	(.003)	1.38	-.241**	(.007)	-.038
University	-.111**	(.003)	-.1.95	-.409**	(.007)	-.070
Age 18-25	Reference			Reference		
Age 26-35	.407**	(.002)	6.28	.894**	(.004)	.116
Age 36-45	.702**	(.002)	9.11	1.214**	(.005)	.127
Age 46-55	.723**	(.003)	8.24	1.589**	(.008)	.113
Regional characteristics:						
Rural	-.028**	(.002)	-.46	-.590**	(.005)	-.075
Baghdad	Reference			Reference		
Dahuk	.158**	(.005)	2.36	.501**	(.014)	.051
Ninawa	-.197**	(.003)	-3.61	.347**	(.013)	.040
As Sulaymaniyah	.428**	(.004)	5.44	.447**	(.008)	.050
Arbil	.330**	(.003)	4.52	.234**	(.008)	.030
Diyala	-.411**	(.003)	-8.59	-.466**	(.007)	-.089
Al Anbar	.067**	(.004)	1.06	.443**	(.009)	.049
Babil	.271**	(.004)	3.79	.108**	(.008)	.015
Karbala	.228**	(.005)	3.25	-.231**	(.100)	-.040
Wasit	.117**	(.004)	1.80	.057**	(.010)	.008
Salahaddin	.182**	(.004)	2.69	.746**	(.015)	.067
An Najaf	.141**	(.004)	2.13	-.471**	(.008)	-.071
Al Qadisiya	-.118**	(.004)	-2.10	-.072**	(.008)	-.011
Al Muthanna	-.173**	(.005)	-3.19	.726**	(.019)	.064
Thiqar	-.372**	(.003)	-.7.58	-.307**	(.008)	-.054
Maysan	-.320**	(.004)	-6.39	.364**	(.018)	.041
Basrah	.012**	(.003)	.20	-.097**	(.008)	-.015
Constant	.926**	(.003)		1.101**	(.007)	
Predicted likelihood of being employed (%)	90.7			92.2		
N	24103			4803		
Pseudo R-squared	.063			.196		

Source: Iraq Household Socio-Economic Survey 2007.
Notes: ** represent statistical significance at the 1 percent level. Values are weighted and therefore nationally representative.