JICA Research Institute

JICA-RI Working Paper

Human Capital Formulation and Gender Equality in Conflict-Affected Islamic States: Case of Basic Education in Yemen

Determinants of School Enrollment of Girls in Rural Yemen: Parental Aspirations and Attitudes toward Girls' Education

Kengo Igei and Takako Yuki

No. 107

August 2015

JICA Research Institute

JICA Research Institute

Use and dissemination of this working paper is encouraged; however, the JICA Research Institute requests due acknowledgement and a copy of any publication for which this working paper has provided input. The views expressed in this paper are those of the author(s) and do not necessarily represent the official positions of either the JICA Research Institute or JICA.

JICA Research Institute
10-5 Ichigaya Honmura-cho
Shinjuku-ku
Tokyo 162-8433 JAPAN
TEL: +81-3-3269-3374
FAX: +81-3-3269-2054

Determinants of School Enrollment of Girls in Rural Yemen: Parental Aspirations and Attitudes toward Girls' Education

Kengo Igei* and Takako Yuki†

Abstract

Parental perceptions have been considered important for the primary school enrollment of girls, particularly in countries where female activities are constrained by social norms and values. In Yemen, primary school enrollment steadily improved throughout the 2000s, but the gender gap still remains. We conducted a comprehensive survey of households and schools in rural Yemen, in which fathers and mothers were separately asked about their educational aspirations for girls and their general attitudes toward girls' education, the marriage age for girls, and their attitudes toward women in the workforce. This paper describes the perceptions of fathers and mothers, and empirically examines their relationship to primary school enrollment for girls aged 6-9 years and 10-14 years, controlling for both demand- and supply-side factors. As a result, we observe a certain degree of variation in paternal and maternal perceptions among households and son preference in both the paternal and maternal aspirations. The regression analyses reveal that both the paternal and the maternal aspirations, and the son preference in their aspirations are strongly related to the enrollment of older girls. Additionally, the analyses show that other paternal perceptions of girls' education, the desirable marriage age, and women in the workforce are statistically significant for older girls. We also found that paternal perceptions are more highly correlated to the enrollment of both younger and older girls than maternal perceptions, and that the supply-side factors such as the qualification of teachers and the presence of female teachers are also significant to the enrollment of girls.

Keywords: access, primary education, gender, Yemen

* Research assistant, JICA Research Institute (Igei.Kengo@jica.go.jp)
† Senior Researcher, Global Link Management, Inc. (yuki.takako@glm.co.jp)

We thank Hamoud Al-Seyani for his cooperation during the survey and Md. Shamsuzzoha and Yuriko Kameyama for their data management. We are also grateful to the Ministry of Education in the Republic of Yemen for the valuable advice and data, and to JICA members, especially the Human Development Department Basic Education Group, for various forms of advice and support for the survey. Finally, we appreciate the helpful comments of the participants at the 2015 annual conference of the Comparative and International Education Society and all reviewers of an earlier version of this paper. All remaining errors are our own.

1. Introduction

Less than two years before the expiration of the Education for All (EFA) goals, the EFA Global Monitoring Report 2013/14 indicated which countries were expected to achieve each goal and which were not (UNESCO 2014). While the majority of countries were assessed as having reached or being close to reaching the goals, Yemen, the country of this case study, was evaluated as strongly progressing but being far from the achievement of both the goals for universal primary education and for gender parity in primary education. The government of Yemen implemented several measures for the enrollment of girls in the 2000s, such as the abolition of school fees for girls, the employment of female teachers, and the installation of latrines at schools. According to the Republic of Yemen and UNICEF (2014), the net enrollment rate in primary education increased from 56% in 1999 to 79% in 2010, and the gender parity index for enrollment in primary education improved from 0.56 in 1999 to 0.78 in 2010. However, both of the 2010 indicators were lower than the average for Arabic countries and that for low-income countries. The latest national representative survey reports that about 1.6 million children aged 6 to 14 years (which accounts for a quarter of the total school-age population) were not enrolled in the 2012-2013 school year, and that girls were more likely than boys to be out of school (IPC-IG and UNICEF 2014, 68).[1] Therefore, a further increase in the enrollment of girls is indispensable for the achievement of universal and gender-equitable primary education in Yemen.

One of the possible obstacles to the enrollment of girls in Yemen is parental perceptions of girls' education affected by the social norms and values that are against female activities in public space. Yemen is located in Caldwell's (1982) "patriarchal belt," which covers the regions from North Africa and the Middle East, to South and East Asia. Patriarchal

[1] In Yemen, the compulsory schooling age is from 6 to 14 years of age. The compulsory education, called "basic education," lasts nine years and consists of six years of "primary education" and three years of "lower-secondary education." In this paper, when we say "primary education" or "primary schools," they mean "basic education" or "basic schools" in the education system of Yemen.

society is characterized by “male domination, son preference, restrictive codes of behavior for women, and the association of family honor with female virtue” (Moghadam 2004, 143). Moreover, in Muslim areas, “veiling and sex-segregation, legitimated on the basis of the *Quran* or *hadith*, form part of the gender system” (Moghadam 2004, 143). Previous studies argue that social restrictions on female activities based on patriarchy have a negative influence on the attainment of female education and labor participation (Smits and Huisman 2013; Spierings 2014; UNDP 2006). In the case of Yemen, the country was ranked at the bottom of the Global Gender Gap Index 2014, which is a worldwide comprehensive evaluation of gender equality in respect of the economy, politics, education, and health (Hausmann et al. 2014).

Patriarchy and patriarchal social norms, however, are not immutable and their influential power varies depending on the time, the country, and the regions within the country. Some scholars have discussed the effect of the modernization of societies on the persistence of patriarchy (e.g., Moghadam 2003; Sharabi 1992). Similarly, while parental perceptions of girls’ education are influenced by conventional social norms, they can also be subject to the modernized values brought about by industrialization and the educational policies of the government for universal education. Smits and Huisman (2013) found less of a gender gap in the enrollment in urban areas than in rural areas in the Middle East and North African countries (MENA) including Yemen. They partly attributed this to the social constraints on girls’ activities and the preference for boy’s education in rural areas. The authors used the household survey data for Yemen for the year of 2003. As mentioned above, school enrollment and gender equity in enrollment improved in Yemen throughout the 2000s. The improvement, however, was not balanced between urban and rural areas. According to the national survey, in 2012, the proportion of out-of-school girls is higher than that of boys in rural areas, especially among children aged 12-14, but it is lower than boys in urban areas (IPC-IG and UNICEF 2014, 69). This difference is attributable not only to supply-side factors such as advantageous infrastructure and school facilities in urban areas, and demand-side factors such as the wealth

conditions of households, but also to the difference in social awareness and understanding about the schooling of girls between urban and rural areas.

Previous studies have directly measured and examined the parental perceptions of the education of children in several developing countries (Chiapa, Garrido, and Prina 2012; Dercon and Singh 2013; Hannum, Kong, and Zhang 2009; Oketch, Mutisya, and Sagwe 2012; Tsujita 2013; Zhang, Kao, and Hannum 2007). However, to the best of our knowledge no studies have ever focused on parental perceptions in the context of the MENA countries. The household and school survey used by this study was conducted in the rural areas of Yemen in 2011. In these areas the enrollment of girls is still low, but the recent modernization and nationwide improvement in enrollment are expected to have changed the perceptions of girls' education among parents. The household part of the survey includes those questions given to fathers and mothers that relate to their general educational aspirations for boys and girls, their attitudes toward girls' education, the desirable marriage age, and their perceptions of women in the workforce. The objectives of this study are to describe these parental perceptions in rural Yemen, and to examine the association of such parental perceptions with actual enrollment of girls, whilst controlling for the additional factors of girls, parents, households, and schools. For the regression analyses, we separated the sample into girls aged 6-9 years and girls aged 10-14 years to take into account the possible differences in the determinants of enrollment by age. As a result, the descriptive analyses reveal a certain degree of variation in paternal and maternal perceptions among households. A preference for sons in both paternal and maternal aspirations was detected, that is, a certain proportion of fathers and mothers had higher aspirations for boys than for girls. The regression results show that both paternal and maternal aspirations, and son preference in their aspirations are strongly related to the enrollment of older girls, and that other paternal perceptions of girls' education, the desirable marriage age, and women in the workforce are statistically significant for older girls. We also found that paternal perceptions are more highly correlated to the enrollment of both younger and older girls than maternal

perceptions are, and that the supply-side factors such as the qualification of teachers and the presence of female teachers in schools are also significant for the enrollment of girls.

The remainder of this paper is organized as follows: Section 2 reviews the existing studies on parental perceptions of girls' education and other issues. Section 3 explains the survey carried out as part of this study and describes the summary statistics of samples and parental perceptions of girls' education, the desirable marriage age, and women in the workforce. Section 4 shows the regression results for the enrollment of girls aged 6-9 years and 10-14 years. Section 5 concludes with the implications of our findings.

2. Literature Reviews

Among other possible determinants of girls' enrollment, this paper focuses on parental perceptions regarding girls' education and other relevant issues. Parental perceptions seem to be largely affected by social norms. Additionally, they may also rely on the individual experience of parents and the context of the households, resulting in differences in their perceptions and decisions on the enrollment of children. In this section, we review the previous studies on parental aspirations, their attitudes toward girls' education, the desirable marriage age for girls, and the perceptions of women in the workforce, and the comparison between paternal and maternal perceptions.

2.1 Parental Aspirations

Aspirations in general have recently received attention from development economists affected by the upsurge in behavioral economics and cognitive science, and a number of studies have found a relationship between aspirations and investments and poverty conditions (Bernard et al. 2014; Genicot and Ray 2014; Macours and Vakis 2009). In the literature on education, parental aspirations for the education of children have been considered as one of the important factors

for educational participation and attainment in developing countries. If parents form their educational aspirations for children by rationally assessing the expected costs and returns of schooling, parents with high aspirations are likely to allow their children to attend school. Moreover, parental aspirations reasonably seem to be affected by son preference or concerns about gender equality. Some studies found a statistically significant relationship between parental aspirations and the schooling of children so far (Chiapa, Garrido, and Prina 2012; Dercon and Singh 2013; Hannum, Kong, and Zhang 2009; Tsujita 2013; Zhang, Kao, and Hannum 2007). In particular, Dercon and Singh (2013) revealed that the aspirations of parents are transferrable to the aspirations of children in India, Peru, and Vietnam, and the aspirations of children are significantly correlated to the probability of enrollment and to vocabulary and mathematics test scores.

2.2 Parental Attitudes toward Girls' Education

Also important for the schooling of children are the parental attitudes toward several aspects of girls' education, particularly in relation to equality, because they may reflect perceptions of the expected costs and returns of schooling as well as the parental aspirations. So far, only a few studies have empirically examined parental attitudes in the context of developing countries. Gumus (2014) used the Turkey Demographic and Health Survey which measured maternal attitudes by the responses to the statement, "It is better to educate a son than a daughter." He found that school attendance is significantly associated with the average attitudes at the community level, calculated as the proportion of mothers who agreed with the above statement, but not with maternal individual attitudes. Hannum, Kong, and Zhang (2009) adopted multiple maternal attitudes concerning the schooling of girls as explanatory variables for the educational attainment of children in China. They found that one of the maternal attitudes about the usefulness of girls' schooling is statistically significant.

2.3 Parental Perceptions of the Marriage Age for Girls

Parental perceptions of the marriage for girls also have an influence on their decision about girls' enrollment in schools. In societies with traditional values, education can be regarded as an obstacle to the marriage of girls because it may reduce the probability of marriage owing to the belief that it facilitates the independence of women and impairs their modesty. The preference for early marriage based on the valuing of female virginity hinders parents from continuing the schooling of daughters for fear of them remaining unmarried. In addition, under Islamic law there are social customs providing for a payment upon marriage from the groom or the groom's family to the bride, the so-called bride price or "*Mahr*" in Arabic.[2] While dowry, a payment from the bride's side, has received attention from researchers, few studies have focused on bride price. As a result, the effect of the education level of brides on bride prices has not yet been clarified (Anderson 2007). However, it seems possible that education decreases the bride price in societies favoring female modesty and virginity.

On the other hand, early marriage has been criticized as a violation of the rights of girls and for its negative influence on the education of girls, fertility, domestic violence, and female bargaining power within households (Jensen and Thornton 2003; UNFPA 2012; UNICEF 2005). As a result, the minimum age of marriage is legally prescribed in most developing countries including those in the MENA region. Although there has not been a law prescribing the minimum age of marriage in Yemen since the previous law was abolished in 1999, concerns about early marriage remain. The government drafted a new law in 2009, but failed to pass the legislation because of an objection made by a parliamentary religious committee.[3] However, alongside exposure to modernization, these movements can contribute to creating parental awareness of the rights and well-being of girls.

[2] Strictly speaking, bride price is not the same as *Mahr* because bride price means the payment from the groom or the groom's family to the family of the bride.

[3] Afterwards, the proposal of the law regarding the minimum marriage age was prepared and submitted to the Cabinet of Yemen in April, 2014. However, as at February 2015 the proposals have not yet been approved by the Cabinet (Human Rights Watch 2015).

Therefore, parents may perceive girls' education as an expected cost in terms of marriage, depending on how much they adhere to traditional social norms. On the other hand, parental awareness of the rights of girls may result in a delay in marriage until the girl has reached an appropriate age and may lead to the girl receiving higher education. Field and Ambrus (2008) found that girls who marry at an older age remain in schooling for longer and have higher levels of literacy. In addition, the marriage age of mothers could also affect the human capital of their children. Sekhri and Debnath (2014) showed that the delayed marriage of mothers leads to high human capital of their children partly through the high education level of mothers which is increased by the delayed marriage.

2.4 Parental Attitudes toward Women in the Workforce

In addition to schooling and marriage, women's working outside of home is often constrained by parental beliefs about gender role separation that are based on social norms. If parents believe that women do not need to work outside the home or become professional workers, they do not have any incentive to provide their daughters with an education. Thus, parental attitudes toward women in the workforce are also important factor for girls' enrollment in schools. Beaman et al. (2012) found that the existence of female chief councilors in villages in India decreased the gender gap in both the educational aspirations of parents and girls, and in educational attainment. The authors did not observe any changes in the labor market opportunities for women and proposed that female leadership plays a role in changing the value that parents and girls place on work, resulting in the improvement of girls' schooling.

2.5 Perceptions of Fathers and Mothers

In this section so far, we have reviewed the literatures on parental perceptions of education, marriage, and women in the workforce. These perceptions could differ between a father and a

mother, and the degree of influence on decisions on the enrollment of girls could also differ between paternal and maternal perceptions. As discussed by Chiappori and Donni (2011), theoretically, decisions on household issues are made through the bargaining of household members with different preference, and the bargaining power of a father and a mother determines whether the paternal or the maternal perceptions are more strongly reflected in the decisions on girls' enrollment. Therefore, it can be inferred that paternal perceptions are more influential than maternal perceptions in the patriarchal system.

Theoretical models commonly assume that mothers are more concerned about the education and health of their children than the fathers are. This assumption has been supported by many empirical studies (e.g., Duflo 2003; Qian 2008; Thomas 1994). However, it is questionable whether mothers have higher perceptions of girls' education than fathers in the context of traditional communities where patriarchal norms strictly constrain women's activities in public spaces. In such communities, mothers are less likely to have enough information to understand the importance of education for girls in their daily lives. In contrast, fathers have opportunities to understand girls' education outside of the home. Access to information about possibilities for the future and social interaction with role models have been confirmed to change people's perceptions and behavior (Bernard et al. 2014; Chiapa, Garrido, and Prina 2012; Jensen and Oster 2009; Macours and Vakis 2009). Thus, it should be examined whether mothers hold perceptions more favorable to girls' education than fathers do, even when the segregation of space by gender is maintained.

3. Data and Descriptive Analysis

3.1 Sampling Framework

This study uses data from an interview-based survey about households and primary schools in Yemen. The survey was conducted by the JICA Research Institute and the Education Research

and Development Center (ERDC) in Yemen, from March to April 2011. The sampling framework for schools is as follows. Firstly, two governorates, Taiz and Dhamar, were selected from all 21 governorates in Yemen for the purposes of the survey. These two governorates are involved in a technical cooperation project with JICA, called Broadening Regional Initiative for Developing Girl's Education (BRIDGE).[4] Secondly, using data from the annual education survey of the Ministry of Education, we chose the five districts per governorate with the worst average GPI for the first to sixth grades in 2004/05. Thirdly, we limited the population of schools to rural and public schools that had both male and female students and at least five female students in the fifth grade in 2008/09. Additionally, we categorized basic schools and schools with both basic and secondary level students into the following two groups within each district: The first group includes schools where the GPI was lower than the average at the governorate level in 2004/05, and where the improvement rate of the GPI from 2004/05 to 2007/08 was higher than the average rate at the governorate level. The second group includes schools where the GPI was lower than the average at the governorate level in 2004/05, and where the improvement rate of the GPI from 2004/05 to 2007/08 was lower than the average rate at the governorate level. Finally, we randomly selected five schools from the first group and three from the second group by district, resulting in 80 schools sampled in total (eight schools per district and 40 schools per governorate).

With regard to the sampling of households, we first chose four schools out of a possible eight per district. This choice was conditional upon the schools having students in the eighth and ninth grades in 2008/09. Then, in each of the villages where one of the chosen schools was located, we randomly selected 25 households from a list of households prepared using the 2004 population census. This choice was conditional upon households having at least

[4] The BRIDGE project focuses on participatory school-based management with school grants. It was carried out in pilot schools in Taiz from 2005 to 2008. The second phase of the project was planned in Taiz and Dhamar from 2010 to 2013, but its implementation has been postponed in light of the deterioration in public security since March 2011. See Yuki et al. (2013) for the details and a brief evaluation of the first phase of the project.

one child aged from 6 to 15 years. In total, the survey covered 962 households in a catchment area of 40 schools in Taiz and Dhamar.

The survey collected the demographic and socio-economic information of households and household members. In addition, the survey asked both fathers and mothers about their educational aspirations for boys and girls, their attitudes toward girls' education, the desirable marriage age of boys and girls, and their perceptions of women in the workforce.[5] To elicit true responses from the mothers, a female enumerator interviewed them in a room separate from their husband or male household members. The detailed information about schools was obtained by interviewing the managers of the schools where sampled households were supposed to enroll their children.[6] After excluding those samples that had missing values in variables of interest, we utilize samples from 803 households, which include 1,268 male children and 1,123 female children aged 6 to 14 years.

3.2 Descriptive Analysis

Figure 1 shows the proportions of boys and girls enrolled in primary schools by age. As indicated by the EFA reports, there is a gender gap in the proportions of enrolled children. The proportion of enrolled girls is lower than that of boys at all ages from 6 to 14 years. The proportions increase with age for both boys and girls aged below 9 years. Almost all of the 10 year old boys are enrolled, and the proportion of enrolled boys remains at a high level of around 90% for ages higher than 10 years. On the other hand, the proportion of girls reaches its

[5] In the case of a father or a mother who was missing or not available, we interviewed a male or female guardian. These interviewees account for 17% and 9% of the total number of paternal and maternal respondents, respectively. To keep the expression concise, we unified the notation as "father" or "mother" hereafter. Even in the case of households including more than two families, the survey interviewed a father and a mother. Twenty percent of the households in our sample consist of more than two families. We assume the responses from such households to be representative of those of the other parents in the household.

[6] Six percent of the children in our sample are currently enrolled in or have been enrolled in schools not covered by the survey. We have kept them in the sample of analyses because our sampled schools are so geographically close to sampled households that the conditions of sampled schools are to some extent expected to have an influence over the decisions on the schooling of children.

peak, which is not more than 90%, at 9 years of age, and continues to decline with age after the peak. The National Social Protection Monitoring Survey (NSPMS), a national representative survey from 2012 and 2013, also showed a similar pattern of enrollment in basic schools, that is, a distinct gap by gender and the inversed U-shape relationship between girls' enrollment and age (IPC-IG and UNICEF 2014, 62). Based on this finding, in the next section we separate the sample into girls aged 6-9 years and those aged 10-14 years for the regression analysis, so as to consider the possibility of different determinants of girls' enrollment.

The survey asked school managers, fathers, and mothers the reasons for girl's non-enrollment in schools. Each respondent was presented with several statements about the demand- and supply-side reasons for non-enrollment, and was requested to choose from the following four answers: "strongly agree," "agree," "disagree," and "strongly disagree." For school managers, the survey separately asked the reasons for non-enrollment of girls younger than 10 years of age and for those aged between 10 and 14 years. For parents, the reasons for non-enrollment were provided by both a father and a mother in each household with at least one girl aged between 6 and 14 years who was not enrolled. Figure 2 reports the proportion of school managers, fathers, and mothers who answered "strongly agree" or "agree" to each of the statements. School managers do not perceive a definite age difference in the reasons for girls' non-enrollment, apart from the necessity for older girls to work in agriculture and other businesses. Almost all of the school managers agree that there is a lack of awareness in families about the importance of education. The other major demand-side reasons are work at home or in agriculture and other business, and marriage or pregnancy for older girls. In terms of the supply-side reasons, most of the school managers agree that the absence of female teachers and decent latrines for girls are valid reasons for non-enrollment.

The responses given by both fathers and mothers are consistent with those given by the school managers in that the need for the girls to work for their family and the absence of female teachers are perceived as the major reasons for girls' non-enrollment. A large proportion

of parents agree that their daughters would not get a job after graduating from school, that the benefits of education are low, and that the income for educated women is low, which reflect parental perceptions of low returns to education. In contrast to the views of the school managers, parents view the cost of education as a hindrance to girls' enrollment. In fact, the largest proportion of mothers agree with this reason for non-enrollment.[7] According to the NSPMS, the main reasons for female students aged 6-11 years dropping out of education were that they "cannot afford to attend" and are "disinterested in school." The aforementioned reasons also apply to female students aged 12-14 years, with the addition of the girls "helping parents at work" (IPC-IG and UNICEF 2014, 70). This result is compatible with our results in that the cost of schooling, the perception of the students and their parents of the low returns to education, and the need to work for their family hinder children from schooling.

As one of the indicators of parental awareness of the importance of education, the survey asked questions regarding the educational aspirations of fathers and mothers. In particular, the survey asked the question (in Arabic) "what level of education do you think is sufficient for boys (girls)?" Four choices of answers were provided: "no education," "basic school," "secondary school," and "university or higher."[8] The survey did not ask parents to answer the questions based on their aspirations for each of their children, but on the education level of children on the whole.

Table 1 shows that the parental aspirations for boys converge at university level: 94% of both fathers and mothers chose the university level. The variation of aspirations for girls among households is larger than for boys: 64% of fathers chose the university level, and 17% chose the secondary and basic school level. The aspirations of mothers for girls show a pattern similar to those of fathers. The aspirations for children stated by fathers and mothers are

[7] The survey also asked parents about the reasons for the non-enrollment of boys. The results are similar to those for girls. The major reasons were not having a job after graduation from school, the cost of education, and the need to work for family.

[8] In Yemen, the basic education, the compulsory education, is followed by secondary education of three years and tertiary education of four to six years.

relatively high in comparison to their own education level. Only 8% of father respondents and 0.3% of mother respondents graduated from university or higher education. Accordingly, 91% of fathers and 99% of mothers aspire to a level of education for boys that is higher than that which they themselves have attained, and 77% of fathers and 96% of mothers aspire to a level of education for girls that is higher than that which they themselves have attained. The large discrepancy between parental aspirations and their own education level was also observed in studies in Mexico (Chiapa, Garrido, and Prina 2012) and in Kenya (Oketch, Mutisya, and Sagwe 2012).

Two factors specific to the survey may explain the high parental aspirations observed in Table 1: the social desirability bias and the way the question on aspirations was expressed. As is often discussed in relation to subjective questions about expectations and attitudes, the responses to these questions can be biased because the respondents may answer such questions in a way they consider to be favored by others in the society, or by the surveyors and researchers. In the case of the present study, the aspirations for boys may be upwardly biased as shown above. However, the direction of the bias in the aspirations for girls is not easily predetermined. While conservative parents who are hesitant to deviate from the social norms may answer with lower aspirations, parents who are tolerant of girls' education may exaggerate their aspirations so as to clarify their attitudes to our enumerators or to us. Consequently, although the aspirations revealed by parents may be distorted, the differences between parents are considered to reflect a certain degree of difference in parental understanding of girls' education.

The other possible factor to be considered when looking at high aspirations is how to draw them out of the parents. Since the survey asked parents about the "sufficient" level of education for boys and girls generally, rather than specifically for their children, parents may have answered with the highest level of education they would like boys and girls to attain irrespective of the feasibility of this for their own children. In this regard, the aspirations

measured by the survey correspond to those defined by Gorard, See, and Davies (2012) and Oketch, Mutisya, and Sagwe (2012). Both of these studies distinguish aspirations from expectations, defining the former as "what individuals *hope* will happen" (Gorard, See, and Davies 2012, 13) or "idealistic goals" (Oketch, Mutisya, and Sagwe 2012, 765), and the latter as "what individuals *think* will happen" (Gorard, See, and Davies 2012, 13) or "realistic appraisals" (Oketch, Mutisya, and Sagwe 2012, 765). The feasibility of the parental aspirations that were revealed is doubtful, but it is important to note that, in contrast to their aspirations for boys, a substantial proportion of fathers and mothers aspired to a level of education for girls that is lower than the university level. Interpreting this as being indicative of the differences in parental attitudes toward girls' education, we examine the relationship between the status of girls' enrollment and parental aspirations in the next section.

Table 2 compares the aspirations for girls between fathers and mothers. As shown by the values on the diagonal line, fathers and mothers answered with the same level of aspiration for girls in 53% of households. Fathers answered with a higher level of education than mothers did in 23% of households, which corresponds to the total values in the area below the diagonal line. In the other 24% of households, mothers answered with a higher level of education than fathers, which corresponds to the total values in the area above the diagonal line. Thus, our survey data reveals that a certain proportion of fathers desire a higher level of education for girls than mothers do. This result seems to be contrary to what we would expect in that mothers are believed to pay more attention than fathers to the education of their daughters, as mothers are considered important actors in the literature on the educational status of children in developing countries. The reason for this may be attributed to the context of the survey. The daily activities of females outside the home are restricted by the social norms in Yemen so that, in comparison to males, females have limited information about the world and fewer opportunities to notice the importance of education for girls. To put it differently, females may be more subject to the conventional social norms than males are due to the environment

discouraging females from changing. We discuss this issue again when interpreting the regression results in the next section.

Table 3 compares the aspirations of fathers and mothers for boys and girls. About one third of fathers and mothers desire a higher level of education for boys than for girls, as represented by the total values in the area below the diagonal line. This implies the existence of son preference in the aspirations not only among fathers, but also among mothers. This finding is consistent with the implications from Table 2 in that mothers do not necessarily favor girls or daughters when it comes to education. The observed son preference among parents seems to be derived either from the restriction on girls' activities imposed by the social norms, or by the reasonable assessment of the current education system and labor market conditions, or both. Therefore, we added son preference in parental aspirations to the regression model of the schooling of girls as one of the explanatory variables.

As illustrated by Figure 3, in the survey, parents were shown eight sentences about education and were requested to choose from four answers: "strongly agree," "agree," "disagree," and "strongly disagree." Although we need to be concerned with the social desirability bias, the majority of fathers and mothers recognize the necessity of girls' education, as shown by the responses to the second and third sentences. However, about half of the fathers and mothers consider that education is more useful for boys than for girls (the first sentence), which is consistent with the implications from Table 3. Moreover, about 70% of fathers and 50% of mothers are afraid that education would damage the marriage of girls (the fourth sentence), and about 20% of fathers and 30% of mothers prioritize girls' marriage over their education (the eighth sentence). With regard to the methods of teaching, about 50% of fathers and 70% of mothers are antipathetic to the co-education of boys and girls (the fifth sentence), and as was indicated by the reasons for girls' non-enrollment above, more than 20% of fathers and mothers are unwilling to allow girls to be taught by male teachers even if there are no female teachers in the school (the sixth sentence). While clear differences in the attitudes

between fathers and mothers cannot be observed, there are a certain degree of differences within the group of fathers and within the group of mothers. We examine the relationship between the enrollment status of girls and the differences in the paternal and maternal attitudes toward girls' education by constructing the attitude indices through factor analysis, as is explained in the next section.

As shown by Table 4, most parents would like boys to marry after the age of 20.[9] On the other hand, both fathers and mothers hope for a lower marriage age for girls than for boys, and 48% of fathers and 37% of mothers answered with ages younger than 20 years. As mentioned above, in Yemen there is no legislation on early marriage for girls. In fact, 15% of the 15 to 19 year old females in our sample are or had been married. The NSPMS reports that as of 2012 about 40% of women aged between 20 and 49 years had been married for the first time by the age of 18, and that 15% of women aged 15 to 49 years were married by the age of 15 (IPC-IG and UNICEF 2014, 157). Thus, the custom of early marriage still remains throughout the entire country, and in contrast to their high aspirations for education, parental attitudes toward girls' marriage are found to be conservative.

Figure 4 illustrates the parental attitudes toward women in the workforce. In the same way as was previously done for the attitudes toward girls' education, the survey presented fathers and mothers with six sentences about labor participation and work for women and asked them to choose their attitude from among four answers which range from "strongly agree" to "strongly disagree." More than half of fathers and mothers show positive attitudes toward all sentences, with the exception of the second sentence for fathers. We do, however, need to keep the social desirability bias in mind. We suppose that the parental attitudes toward women in the workforce are related to the perceptions of expected returns to girls' schooling, and the decisions about girls' enrollment. As well as the attitudes toward girls' education, we

[9] Specifically, the survey asked fathers and mothers: "In your opinion, at what age should boys (girls) marry?" The four prepared choices of age ranges are shown in Table 4.

calculate the indices of the attitudes of fathers and mothers toward women in the workforce using the factor analysis method, and incorporate them as one of the regressors for the regression model of girls' enrollment.

4. Regression Analyses

4.1 Regression Methods

The dependent variable of our regression analyses is a dummy variable indicating whether or not a girl was enrolled in a primary school at the time of the survey. We divide the samples of girls into one sub-sample of girls aged 6 to 9 years and one of girls aged 10 to 14 years, and run the probit regression model for each sub-sample.

The explanatory variables of interest to us are parental educational aspirations, and their perceptions of girls' education, the desirable marriage age, and women in the workforce. For aspirations, we also include a son preference dummy variable indicating whether a father or a mother desires a higher education level for boys than for girls. For attitudes toward girls' education and women in the workforce, we apply the confirmatory factor analysis method to construct the indices for each of the attitudes given by fathers and mothers. Firstly, we used numbers to represent the responses for the attitudes in the following manner: "1=strongly disagree," "2=disagree," "3=agree," "4=strongly agree." Secondly, we computed the polychoric correlation matrix among fathers and mothers respectively rather than the Pearson correlation matrix as suggested by Holgado–Tello et al. (2010) in the case of the factor analysis using Likert-scale variables. Finally, in order to keep the analyses simple, we assumed a single factor behind the parental attitudes and estimated a model with a single factor using the maximum likelihood. Appendix Table 1 reports the estimates of factor loadings and the major test statistics for attitudes of fathers and mothers toward girls' education and women in the workforce. The signs of estimated factor loadings match with our intuition, that is, the first,

fifth, and eighth statements against girls' education are assigned negative loadings, and other affirmative statements for girls' education and women in the workforce are assigned positive loadings. Considering the measurement errors in each index, we divided fathers and mothers into three groups, called "less positive," "moderate," and "positive," based on the tertiles of the predicted factor scores.

As well as parental aspirations and attitudes, we control for the variables of individuals, parents/households, and schools. The statistics of explanatory variables used in the regression analyses are summarized in Table 5. Sample girls aged 6 to 14 years have on average 4.63 siblings, consisting of 2.27 older and 2.37 younger siblings.[10] The distance from a school is based on the responses of household heads for children currently enrolled in school. For non-enrolled children, we imputed the average values of enrolled children in the same community subordinate to villages, called *Mahara*, rather than in the same school catchment area, so as to obtain more accurate estimates of distances from schools. Among the characteristics of parents and households, no more than 20% of mothers answered that they can read and write their names. In fact, 88% of mothers had never attended a formal school and only 5% of mothers graduated from basic schools or higher education. Regarding the wealth conditions of households, we constructed the household wealth index by the principle component analysis. Appendix Table 2 shows the result of the principle component analysis for household wealth. Following Filmer and Pritchett (2001), we categorized the bottom 40% of households as "poor," the medium 40% as "middle," and the top 20% as "rich." We include the dummy variables of middle and rich categories of households in the regression model with the poor category of households as a reference group. The lower part of Table 5 shows the

[10] Note that the number of older siblings in this study can be by definition smaller than the true number for two reasons. Firstly, the variable on the number of siblings was constructed by using the questions identifying a father and a mother for a child. Since the survey asked the parents-identifying questions only for a child aged 0 to 19 years, siblings who were older than 20 years are not counted in the number of siblings. Second, we took into account only siblings who are living together because the survey does not cover family members living in places other than the households visited. It is reasonable to suppose that siblings who are older are more likely to leave home due to study in higher education, work, or marriage, so that the number of elder siblings might be underestimated.

characteristics of the 40 basic schools sampled. The average student teacher ratio for all grades is 29.4, and its range is from 10.8 to 61.5. As indicators of the quality of educational services, we chose the ratios of teachers who had graduated from university or higher education, which was on average 0.663, and the presence of female teachers, which amounted to 52.5% of the sampled schools. Moreover, as indicators for learning environments, we chose the existence of latrines for girls and drinking water at school, which amounted to 65% and 37.5%, respectively. Finally, with regard to the cost of schooling, annual expenditure for basic education was calculated based on the responses given by heads of households about the cost of registration, school certificates, textbooks, school uniforms, and food and others for teachers for the year before the survey. We firstly summed up the total expenditure per girl by household, and then, computed the average expenditure of households by school catchment area. As a result, the households spent about 2,300 rials per girl, which accounted for approximately 0.8% of the average total income of sampled households.

4.2 Regression Results

Table 6 shows the estimation results of the probit model for the enrollment of girls aged 6 to 9 years. The estimates of coefficients are shown in the form of the average marginal effect. Regarding aspirations, only the paternal aspiration dummy for university or higher is statistically significant, as shown in the first column. Although not reported here, we also separately ran the regression models including paternal or maternal aspirations, and confirmed that all estimates for aspirations when included together were smaller than they were when included separately. However, the magnitudes of significance were unchanged. Thus, the correlation between paternal and maternal aspirations does not affect the regression results. In terms of son preference in the aspirations, while paternal son preference is negatively significant, maternal son preference is also negative but insignificant, as shown in the second

column. This result holds when son preference dummies for fathers and mothers are separately included. Consequently, the probability of enrollment is lower for girls whose fathers think that boys should receive higher education than girls. The third column shows the results for the parental attitudes toward girls' education. The "positive" group of fathers and the "moderate" group of mothers are positively significant. The results for paternal attitudes are consistent with the regression results for paternal aspirations, in that girls are more likely to attend school if their fathers understand the importance of girls' education. However, it seems to be slightly puzzling that the "moderate," but not the "positive," attitudes of mothers are significant. This may be because some mothers who do not have any decision-making powers in relation to girls' enrollment may have overstated their attitudes. As explained above, the attitudes toward girls' education were measured by just four scale points so that it is difficult for us to distinguish between mothers with and mothers without an ability to act. With respect to parental perceptions of the marriage age for girls and of women in the workforce, not all of the paternal and maternal variables are statistically significant, as reported in the fourth and fifth columns. The result was almost the same even when the paternal and maternal variables were included separately. These insignificant results may be because marriage and work in adulthood are not urgent issues for younger girls, and parental perceptions of them are not strongly related to the enrollment of younger girls.

Among other things, the number of older siblings and the distance from a school are negatively significant, though the latter is not perceived by school managers and parents as being a major reason for the non-enrollment of girls in schools (Figure 2). Regarding parental and household characteristics, the nonagricultural labor of fathers is significantly associated with girls' enrollment. Among the school characteristics, the high education level of teachers is positively significant and, with the exception of the first model, the presence of female teachers is also positively significant. This is consistent with the reasons for non-enrollment stated by the school managers and parents. These results indicate that the composition of

teachers leads to parents expecting high returns to schooling. Finally, educational expenditure is negatively significant, which is also compatible with the reasons for non-enrollment provided by parents, but not by the school managers.

Table 7 shows the regression results for the enrollment of girls aged 10 to 14 years. As shown in the first and second columns, both the aspirations and son preference of fathers and mothers are highly significant. Looking at parental attitudes toward girls' education, paternal "positive" and maternal "moderate" attitudes are statistically significant, as shown in the third column; this is the same pattern of results as in Table 6. As reported in the fourth and fifth columns, both the desirable marriage age provided by fathers when higher than 25 years of age and the paternal attitudes toward women in the workforce are significant. On the other hand, the desirable marriage age provided by mothers and the maternal attitudes toward women in the workforce are not statistically significant. Thus, compared with the results of Table 6, parental perceptions, especially paternal perceptions, seem to be more important for the enrollment of older girls than for younger girls. This indicates that parental perceptions increasingly take on importance when children grow up and parents, under the influence of social norms, start to think about the future of their children.

Among other explanatory variables, the number of younger siblings and the distance from a school are strongly associated with the enrollment of older girls. Looking at the characteristics of the parents, only the paternal years of schooling are statistically significant. This suggests that more educated fathers better understand how important it is for older girls to continue attending school. Among the characteristics of schools, the education level of teachers and the presence of female teachers are positively significant for the enrollment of older girls; this was also the case for younger girls. Therefore, not only parental perceptions, but also supply-side factors play an important role in the enrollment of older girls.

The findings of this section for both younger and older girls imply that the interventions on the demand side, such as awareness-building programs for parents and

communities, are necessary for encouraging parents to enroll girls at a younger age and keeping adolescent girls in schools. The findings also suggest that the educational policies on the supply side, such as the employment of educated and female teachers, are essential for improving the enrollment of girls in rural Yemen.

In addition, it is noteworthy that paternal perceptions are more highly correlated to girls' enrollment than maternal perceptions. This implies that paternal opinions have more influence on girls' enrollment than maternal opinions do. While this result itself may be attributable to the dominant position of fathers within the household in line with the patriarchal social norms, the survey raises another possibility that the strict division of roles in the education of children, specifically the lead role taken by fathers, does not attach much importance to maternal opinions. The survey asked to fathers and mothers how they assist in the education of their children. We did not find any clear differences in the type of assistance provided by fathers and mothers in the home, such as encouraging children to do daily homework, but we did find large differences in the assistance given outside of the home, such as attending meetings at school. For the households with at least one enrolled child, 91% of fathers have been to the schools their children attend, whereas only 16% of mothers have been. There is an observable gap in information about schools between fathers and mothers. The survey asked parents and school managers about the existence of a father or mother council at a school. As a result, more than half of the fathers correctly answered the questions about the existence or absence of a father or mother council, but only about one third of mothers did. Although the literature on the education of children places an emphasis on the roles of mothers, our findings indicate that policy makers should not overlook the roles fathers play in the improvement of girls' enrollment in the context of social norms that are male-dominant.

5. Conclusions

Social norms that are against the activities of women and the parental perceptions that are based on them have been viewed as major constraints on girls' enrollment in schools, particularly in the MENA region. To our knowledge, this study is the first attempt at empirically examining parental perceptions and their relationship with girls' enrollment in Yemen and the MENA region, through a comprehensive survey of households and schools.

Our descriptive analyses revealed the existence of a certain degree of variation in parental aspirations for the education of children and in their perceptions of girls' education, the desirable age of marriage, and women in the workforce. These variations exist both among households and between fathers and mothers. We found that in the Yemeni context, mothers do not always aspire to higher levels of education than fathers do. We also observed the existence of son preference within both the paternal and the maternal aspirations for the education of children. The regression results differ between the samples of younger and older girls. Both the paternal and maternal aspirations are more highly correlated to the enrollment of older girls than they are to the enrollment of younger girls. This indicates the importance of a parental awareness of girls' education in the schooling of adolescent girls. In general, paternal perceptions are found to be more highly correlated to the enrollment of both younger and older girls than maternal perceptions. While this may reflect the dominant position of fathers within households, the additional data from the survey suggests that the division of roles in the education of children based on gender hinders mothers from obtaining the necessary information about schools and the labor market conditions. As a result, maternal opinions are less likely to be reflected in decisions on the enrollment of girls in schools. Aside from the parental perceptions, we found that the supply-side factors, such as the education level of teachers and the presence of female teachers, are important for the enrollment of both younger and older girls.

The key finding of this study in relation to policy implications is that among households, and between fathers and mothers, the perception of girls' education, of the marriage age, and of women in the workforce differs. The perceptions held by parents, particularly by fathers, are correlated to girls' enrollment even in rural regions of Yemen where traditional social norms are considered to still be influential. This finding supports the validity of awareness-raising programs in rural areas, and the higher correlation between paternal perceptions and girls' enrollment suggests that we need to take measures based on the social context of the area. Mothers have been considered as a primary target for interventions aimed at improving the educational attainment of children. However, in rural Yemen, the divisions of parental roles by gender may prevent mothers from joining in the decisions about the education of children, and the restriction on female activities in public spaces may hinder mothers from obtaining sufficient information to make decisions. Thus, our findings indicate the significance of considering the social context in relation to parental decisions when planning any interventions for children.

In addition, the regression results revealed the importance of parental perceptions in filling the gender gap not only in enrollment in primary schools, but also in completion of primary education. As Figure 1 shows, the relationship between the proportion of enrolled girls and their age follows an inverted U-shaped curve in our study site, which indicates the existence of problems with both late entry and dropout. Our regression results showed that parental perceptions are conducive to the enrollment of younger and older girls. These results imply that parental perceptions can play an important role in girls' completing primary education by decreasing late entry and dropout.

Moreover, we found that the factors for schools are significantly associated with the enrollment of younger and older girls. Therefore, it is necessary to support both sides of parents and schools in order to improve girls' educational attainment.

References

Anderson, Siwan. 2007. “The Economics of Dowry and Brideprice.” *Journal of Economic Perspectives* 21 (4): 151–74.

Beaman, Lori, Esther Duflo, Rohini Pande, and Petia Topalova. 2012. “Female Leadership Raises Aspirations and Educational Attainment for Girls: A Policy Experiment in India.” *Science* 335 (6068): 582–86.

Bernard, Tanguy, Stefan Dercon, Kate Orkin, and Alemayehu Seyoum Taffesse. 2014. “The Future in Mind: Aspirations and Forward-Looking Behaviour in Rural Ethiopia.” CSAE Working Paper WPS/2014-16, Oxford: Centre for the Study of African Economies.

Caldwell, John. 1982. *The Wealth Flows Theory of Fertility Decline.* New York: Academic Press.

Chiapa, Carlos, José Luis Garrido, and Silvia Prina. 2012. “The Effect of Social Programs and Exposure to Professionals on the Educational Aspirations of the Poor.” *Economics of Education Review* 31 (5): 778–98.

Chiappori, Pierre-André, and Olivier Donni. 2011. “Non-Unitary Models of Household Behavior: A Survey of the Literature.” In: *Household Economic Behaviors*, edited by Jose A. Molina, 1-40, Berlin: Springer.

Dercon, Stefan, and Abhijeet Singh. 2013. “From Nutrition to Aspirations and Self-Efficacy Gender Bias over Time among Children in Four Countries.” *World Development* 45: 31–50.

Duflo, Esther. 2003. “Grandmothers and Granddaughters: Old-Age Pensions and Intrahousehold Allocation in South Africa.” *World Bank Economic Review* 17 (1): 1-25.

Field, Erica, and Attila Ambrus. 2008. “Early Marriage, Age of Menarche, and Female Schooling Attainment in Bangladesh.” *Journal of Political Economy* 116 (5): 881–930.

Filmer, Deon, and Lant H. Pritchett. 2001. “Estimating Wealth Effects without Expenditure Data—or Tears: An Application to Educational Enrollments in States of India.” *Demography* 38 (1): 115–32.

Genicot, Garance, and Debraj Ray. 2014. “Aspirations and Inequality.” Working Paper 19976, Cambridge: National Bureau of Economic Research.

Gorard, Stephen, Beng Huat See, and Peter Davies. 2012. *The Impact of Attitudes and Aspirations on Educational Attainment and Participation.* York: The Joseph Rowntree Foundation.

Gumus, Sedat. 2014. “The Effects of Community Factors on School Participation in Turkey: A Multilevel Analysis.” *International Review of Education* 60 (1): 79–98.

Hannum, Emily, Peggy Kong, and Yuping Zhang. 2009. “Family Sources of Educational Gender Inequality in Rural China: A Critical Assessment.” *International Journal of Educational Development* 29 (5): 474–86.

Hausmann, Ricardo, Laura D. Tyson, Yasmina Bekhouche, and Saadia Zahidi. 2014. *The Global Gender Gap Report 2014*. Geneva: World Economic Forum.

Holgado–Tello, Francisco Pablo, Salvador Chacón–Moscoso, Isabel Barbero–García, and Enrique Vila–Abad. 2008. “Polychoric versus Pearson Correlations in Exploratory and Confirmatory Factor Analysis of Ordinal Variables.” *Quality & Quantity* 44 (1): 153–66.

Human Rights Watch. 2015. Human Rights Watch Submission to the CEDAW Committee on Yemen’s Periodic Report. 62th Session. Accessed March 31, 2015 http://www.hrw.org/news/2015/02/10/human-rights-watch-submission-cedaw-committee-yemen-s-periodic-report-62th-session.

IPC-IG, and UNICEF. 2014. *Yemen National Social Protection Monitoring Survey (NSPMS): 2012-2013 Final Report*. Accessed March 31, 2015 http://www.ipc-undp.org/pub/eng/Yemen_National_Social_Protection_Monitoring_Survey_2012_2013.pdf.

Jensen, Robert, and Rebecca Thornton. 2003. “Early Female Marriage in the Developing World.” *Gender & Development* 11 (2): 9–19.

Jensen, Robert, and Emily Oster. 2009. “The Power of TV: Cable Television and Women’s Status in India.” *Quarterly Journal of Economics* 124 (3): 1057–1094.
Macours, Karen, and Renos Vakis. 2009. “Changing Households’ investments and Aspirations through Social Interactions: Evidence from a Randomized Transfer Program.” Policy Research Working Paper 5137, Washington, DC: World Bank.
Moghadam, Valentine M. 2003. *Modernizing Women: Gender and Social Change in the Middle East*. Boulder: Lynne Rienner Publishers.
──. 2004. “Patriarchy in Transition: Women and the Changing Family in the Middle East.” *Journal of Comparative Family Studies* 35 (2): 137–62.
Oketch, Moses, Maurice Mutisya, and Jackline Sagwe. 2012. “Parental Aspirations for Their Children’s Educational Attainment and the Realisation of Universal Primary Education (UPE) in Kenya: Evidence from Slum and Non-Slum Residences.” *International Journal of Educational Development* 32 (6): 764–72.
Qian, Nancy. 2008. “Missing Women and the Price of Tea in China: The Effect of Sex-Specific Earnings on Sex Imbalance.” *The Quarterly Journal of Economics* 123 (3): 1251–85.
Republic of Yemen, and UNICEF. 2014. *Situation Analysis of Children in Yemen 2014*. New York: UNICEF.
Sekhri, Sheetal, and Sisir Debnath. 2014. “Intergenerational Consequences of Early Age Marriages of Girls: Effect on Children’s Human Capital.” *Journal of Development Studies* 50 (12): 1670–86.
Sharabi, Hisham. 1992. *Neopatriarchy: A Theory of Distorted Change in Arab Society*. New York; Oxford: Oxford University Press.
Smits, Jeroen, and Janine Huisman. 2013. “Determinants of Educational Participation and Gender Differences in Education in Six Arab Countries.” *Acta Sociologica* 56 (4): 325–46.
Spierings, Niels. 2014. “The Influence of Patriarchal Norms, Institutions, and Household Composition on Women’s Employment in Twenty-Eight Muslim-Majority Countries.” *Feminist Economics* 20 (4): 87–112.
Thomas, Duncan. 1990. “Like Father, Like Son; Like Mother, Like Daughter: Parental Resources and Child Height.” *Journal of Human Resources* 29 (4): 950–88.
Tsujita, Yuko. 2013. “Factors That Prevent Children from Gaining Access to Schooling: A Study of Delhi Slum Households.” *International Journal of Educational Development* 33 (4): 348–57.
UNDP. 2006. *The Arab Human Development Report 2005: Towards the Rise of Women in the Arab World*. New York: Regional Bureau for Arab States, UNDP.
UNESCO. 2014. *EFA Global Monitoring Report 2013/4: Teaching and Learning: Achieving Quality for All*. Paris: UNESCO.
UNFPA. 2012. *Marrying Too Young: End Child Marriage*. New York: UNFPA.
UNICEF. 2005. *Early Marriage: A Harmful Traditional Practice, a Statistical Exploration*. New York: UNICEF.
Yuki, Takako, Keiko Mizuno, Keiichi Ogawa, and Sakai Mihoko. 2013. “Promoting Gender Parity in Basic Education: Lessons from a Technical Cooperation Project in Yemen.” *International Review of Education* 59 (1): 47-66.
Zhang, Yuping, Grace Kao, and Emily Hannum. 2007. “Do Mothers in Rural China Practice Gender Equality in Educational Aspirations for Their Children?” *Comparative Education Review* 51 (2): 131–57.

Table 1. Parental aspirations for boys and girls

	Boys		Girls	
	Fathers	Mothers	Fathers	Mothers
No education	3 (0.4%)	1 (0.1%)	20 (2%)	60 (7%)
Basic school	11 (1%)	7 (1%)	133 (17%)	77 (10%)
Secondary school	38 (5%)	40 (5%)	138 (17%)	134 (17%)
University or higher	751 (94%)	755 (94%)	512 (64%)	532 (66%)
Observations	803	803	803	803

Source: 2011 JICA-RI/ERDC Survey.

Table 2. Comparison of aspirations for girls between fathers and mothers (percentage)

		Mothers				
		No education	Basic school	Secondary school	University or higher	Total
Fathers	No education	0.4	0.4	0.4	1	2
	Basic school	1	3	3	9	17
	Secondary school	2	2	4	10	17
	University or higher	4	4	10	46	64
	Total	7	10	17	66	100

Source: 2011 JICA-RI/ERDC Survey.

Table 3. Comparison of aspirations for boys and girls by fathers and mothers (percentage)

(a) Fathers		Girls				
		No education	Basic school	Secondary school	University or higher	Total
Boys	No education	0.1	0.0	0.1	0.1	0.4
	Basic school	0.4	1	0.3	0.1	1
	Secondary school	1	2	2	0.4	5
	University or higher	1	14	15	63	94
	Total	2	17	17	64	100

(b) Mothers		Girls				
		No education	Basic school	Secondary school	University or higher	Total
Boys	No education	0.1	0	0	0	0.1
	Basic school	1	0.4	0	0	1
	Secondary school	1	2	2	0	5
	University or higher	6	7	15	66	94
	Total	7	10	17	66	100

Source: 2011 JICA-RI/ERDC Survey.

Table 4. Parental perceptions on the desirable marriage age for boys and girls

	Boys		Girls	
	Fathers	Mothers	Fathers	Mothers
Age:				
14 or younger	9 (1%)	5 (1%)	14 (2%)	21 (3%)
15-19	119 (15%)	38 (5%)	371 (46%)	270 (34%)
20-24	422 (53%)	262 (33%)	365 (45%)	456 (57%)
25 or older	253 (32%)	498 (62%)	53 (5%)	56 (7%)
Observations	803	803	803	803

Source: 2011 JICA-RI/ERDC Survey.

Table 5. Summary statistics of explanatory variables by the sample

	Mean (SD)
Individual characteristics of girls aged 6-14 (N=1,123)	
Number of siblings:	4.63 (1.97)
older siblings	2.27 (1.71)
younger siblings	2.37 (1.70)
Distance from a school (minutes)	21.3 (13.9)
Mother missing (%)	4.72
Parents/Household characteristics (N=803):	
Schooling years of father	5.55 (5.76)
Mother literate: mother can read/write her name (%)	14.7
Job of father: no job (%)	45.3
agricultural labor (%)	40.3
non-agricultural labor (%)	42.1
Household wealth index: poor (%)	40.1
middle (%)	40
rich (%)	19.9
In Taiz governorate (%)	47.4
School characteristics (N=40):	
Student teacher ratio	29.4 (11.9)
Ratio of teachers from university/higher	0.663 (0.246)
With female teachers (%)	52.5
With latrines for girls (%)	65.0
With drinking water (%)	37.5
Annual Educational expenditures per girl (Rials)	2,278 (720)

Source: 2011 JICA-RI/ERDC Survey.
Note: Standard deviations are reported in parentheses for continuous variables.

Table 6: Regression results of probit model for the enrollment of girls aged 6 to 9

	(1)	(2)	(3)	(4)	(5)
Parental perceptions:					
Paternal aspirations: Secondary school	0.09				
University/higher	0.16***				
Maternal aspirations: Secondary school	0.06				
University/higher	0.06				
Paternal preference for son		-0.13***			
Maternal preference for son		-0.01			
Paternal attitudes, girls' education: Moderate			0.04		
Positive			0.12**		
Maternal attitudes, girls' education: Moderate			0.09**		
Positive			0.08		
Paternal desirable marriage age: 20-24				-0.01	
25-				-0.03	
Maternal desirable marriage age: 20-24				0.04	
25-				-0.01	
Paternal attitudes, women in the workforce: Moderate					0.08
Positive					0.07
Maternal attitudes, women in the workforce: Moderate					0.03
Positive					0.09
Individual characteristics:					
7 years old	0.29***	0.31***	0.30***	0.31***	0.30***
8 years old	0.37***	0.39***	0.38***	0.40***	0.39***
9 years old	0.54***	0.54***	0.51***	0.53***	0.54***
Number of older siblings	-0.02**	-0.02*	-0.02**	-0.02**	-0.02*
Number of younger siblings	-0.004	-0.003	-0.005	-0.01	-0.01
Log of minutes of commute to school	-0.08**	-0.07**	-0.08**	-0.08**	-0.08**
Parents/Household characteristics:					
No mother	0.12	0.10	0.10	0.08	0.09
Schooling years of father	-0.002	-0.001	-0.003	-0.001	-0.0002
Mother can read/write her name	0.03	0.05	0.03	0.04	0.03
Job of father: Agricultural labor	0.11*	0.11*	0.08	0.08	0.08
Non-agricultural labor	0.16**	0.16***	0.15**	0.13**	0.12*
Household wealth index: Middle	0.005	0.004	0.01	0.01	0.001
Rich	0.04	0.05	0.06	0.06	0.06
In Taiz governorate	0.21***	0.22***	0.23***	0.24***	0.22***
School characteristics:					
Student teacher ratio	0.001	0.001	0.002	0.001	0.001
Ratio of teachers from university/higher	0.13*	0.15**	0.13*	0.14*	0.14*
With female teachers	0.07	0.09*	0.10**	0.09*	0.08*
With latrines for girls	0.01	0.01	-0.01	-0.003	-0.01
With drinking water	0.03	0.03	0.03	0.04	0.04
Log of educational expenditures	-0.17***	-0.16**	-0.14**	-0.15**	-0.13**
Pseudo R^2	0.255	0.251	0.254	0.234	0.244
Observations	503	503	503	503	503

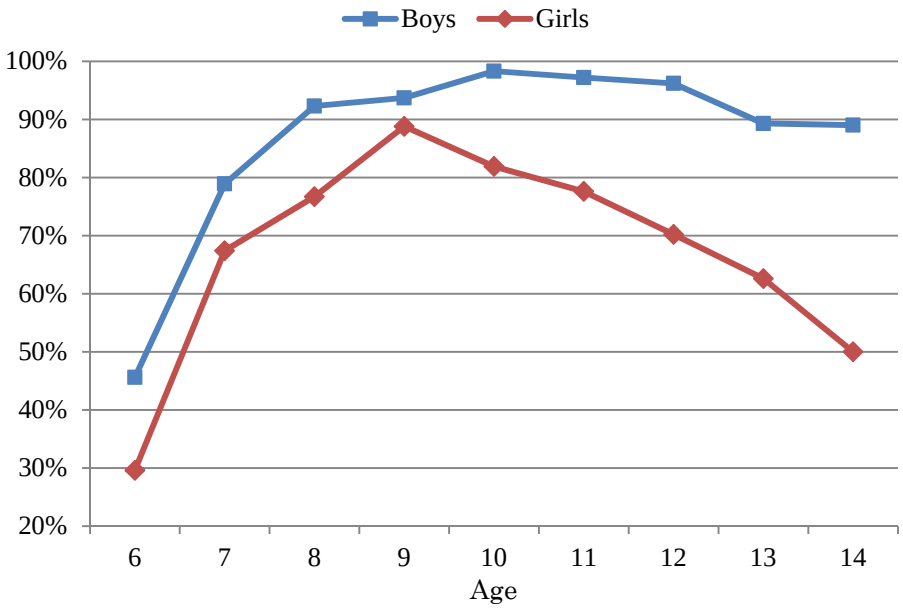
Note: Estimates of coefficient are converted to the average marginal effect. Standard error is computed using the Delta method. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 7. Regression results of probit model for the enrollment of girls aged 10 to 14

	(1)	(2)	(3)	(4)	(5)
Parental perceptions:					
Paternal aspirations: Secondary school	0.20***				
University/higher	0.17***				
Maternal aspirations: Secondary school	0.14***				
University/higher	0.16***				
Paternal preference for son		-0.10**			
Maternal preference for son		-0.09**			
Paternal attitudes, girls' education: Moderate			0.06		
Positive			0.16***		
Maternal attitudes, girls' education: Moderate			0.09**		
Positive			0.07		
Paternal desirable marriage age: 20-24				0.05	
25-				0.18**	
Maternal desirable marriage age: 20-24				0.05	
25-				-0.03	
Paternal attitudes, women in the workforce: Moderate					0.12***
Positive					0.18***
Maternal attitudes, women in the workforce: Moderate					0.01
Positive					0.02
Individual characteristics:					
11 years old	-0.01	-0.01	-0.01	-0.04	-0.02
12 years old	-0.11***	-0.11***	-0.10**	-0.10**	-0.09**
13 years old	-0.17***	-0.16***	-0.17***	-0.18***	-0.17***
14 years old	-0.29***	-0.29***	-0.27***	-0.28***	-0.28***
Number of older siblings	-0.01	-0.02	-0.02	-0.01	-0.02
Number of younger siblings	-0.03***	-0.03***	-0.03***	-0.03***	-0.03**
Log of minutes of commute to school	-0.09***	-0.08**	-0.10***	-0.09**	-0.09***
Parents/Household characteristics:					
No mother	-0.12	-0.10	-0.10	-0.13	-0.09
Schooling years of father	0.01**	0.01**	0.01**	0.01**	0.01**
Mother can read/write her name	0.06	0.08	0.05	0.08*	0.06
Job of father: Agricultural labor	-0.04	-0.04	-0.04	-0.06	-0.05
Non-agricultural labor	0.04	0.05	0.06	0.02	0.03
Household wealth index: Middle	0.02	0.03	0.02	0.03	0.05
Rich	0.05	0.06	0.08	0.07	0.09
In Taiz governorate	0.11**	0.11**	0.13**	0.13***	0.14***
School characteristics:					
Student teacher ratio	0.003	0.004*	0.01**	0.004**	0.003
Ratio of teachers from university/higher	0.27***	0.28***	0.29***	0.32***	0.29***
With female teachers	0.08*	0.10**	0.11**	0.12**	0.10**
With latrines for girls	0.03	0.01	-0.01	-0.01	-0.01
With drinking water	0.06	0.05	0.07	0.07	0.08
Log of educational expenditures	0.02	0.01	0.03	0.03	0.05
Pseudo R^2	0.172	0.146	0.158	0.140	0.153
Observations	620	620	620	620	620

Note: Estimates of coefficient are converted to the average marginal effect. Standard error is computed using the Delta method. *significant at 10%; **significant at 5%; ***significant at 1%.

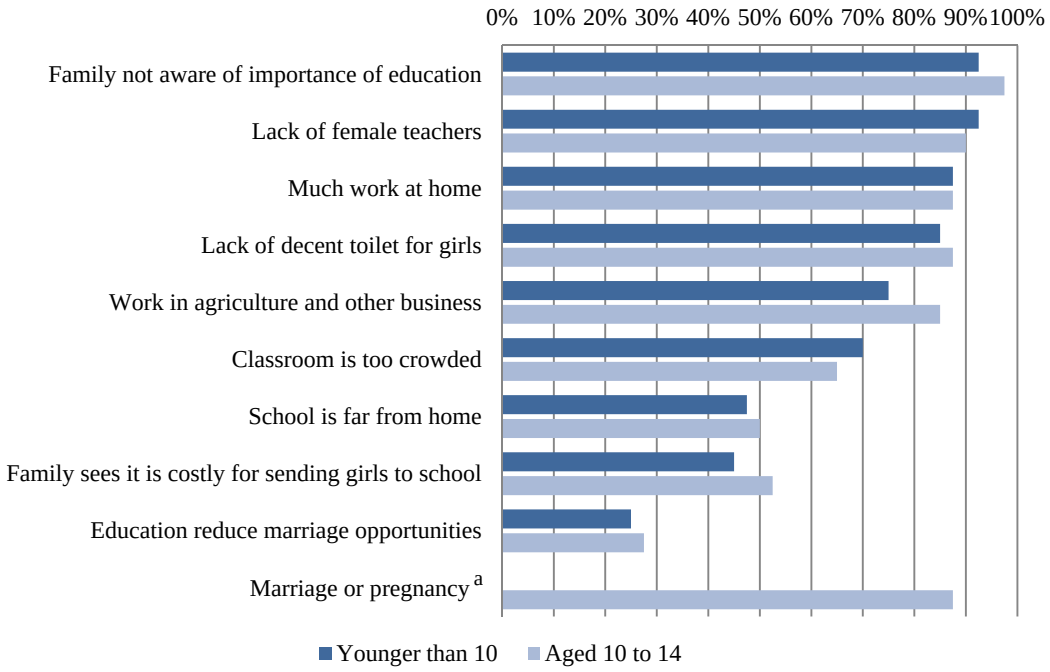
Figure 1. Proportions of enrolled children by gender and age



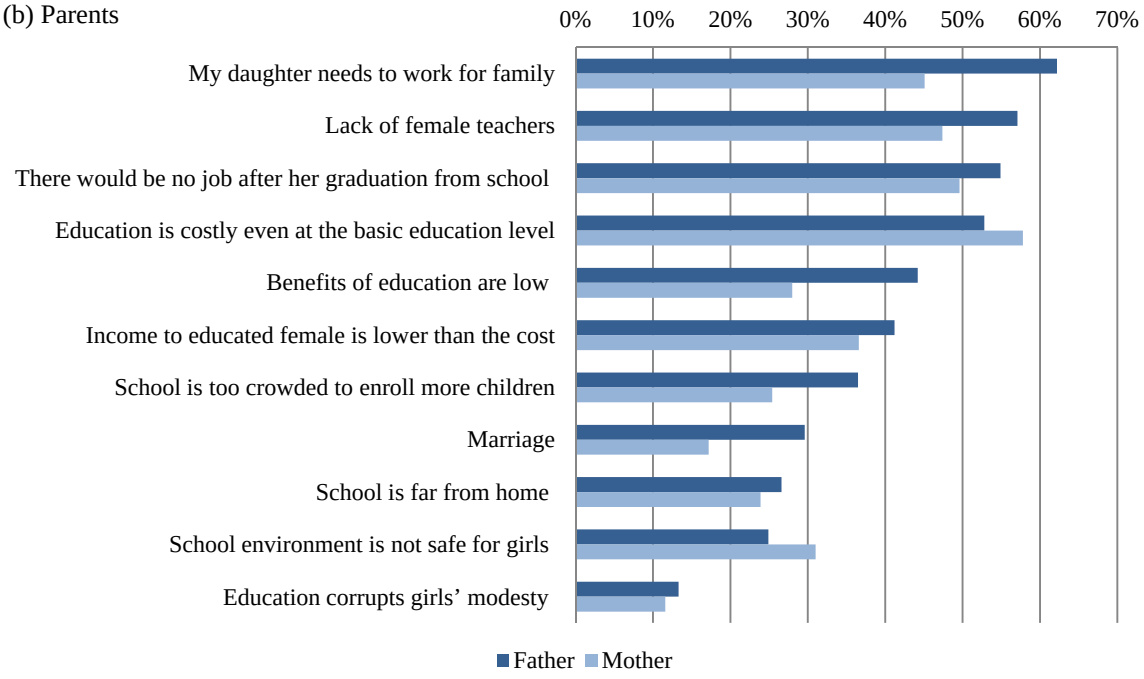
Source: 2011 JICA-RI/ERDC Survey

Figure 2. Reasons for girls' non-enrollment: perceptions of school managers and parents

(a) School managers

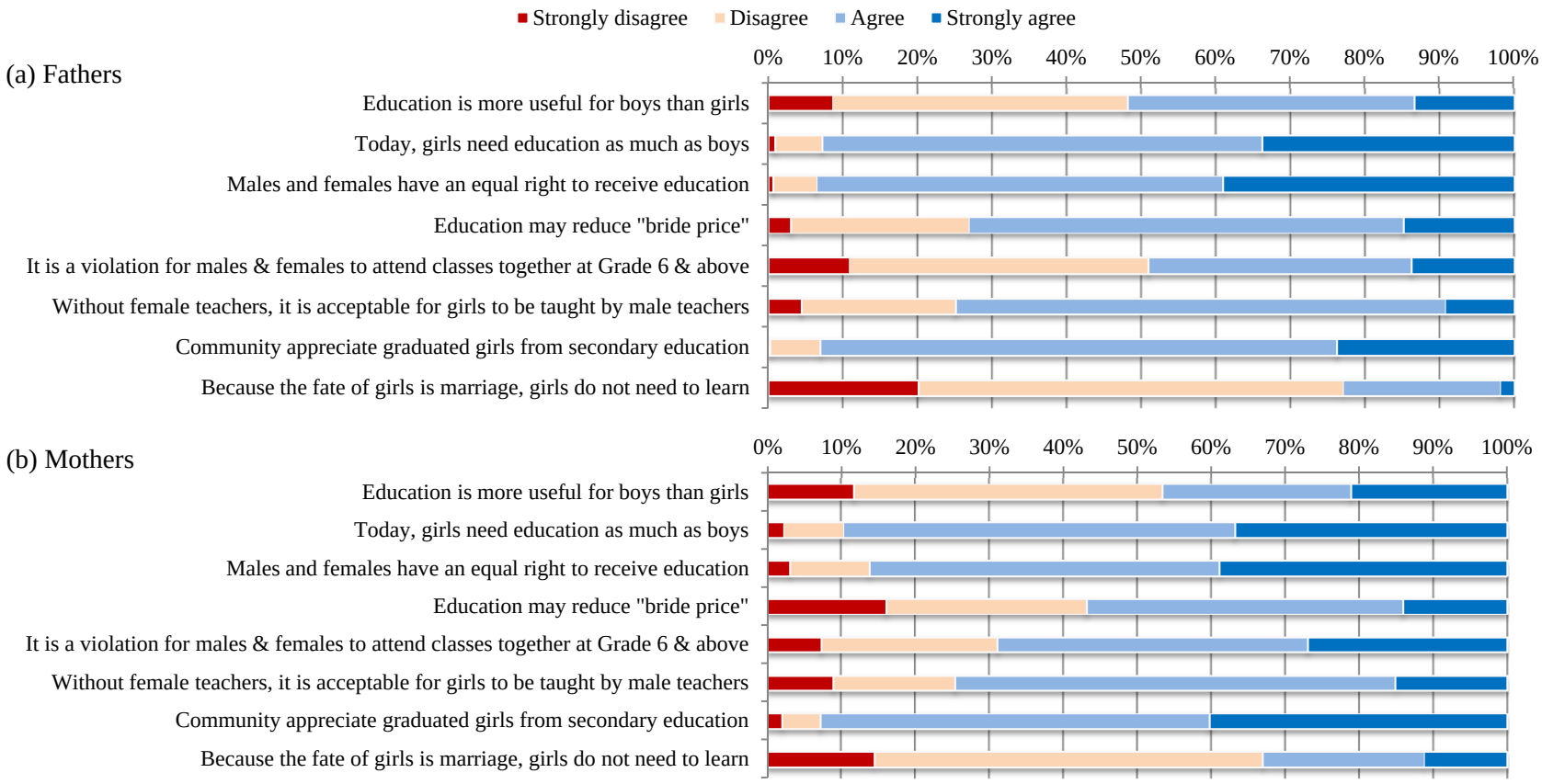


(b) Parents



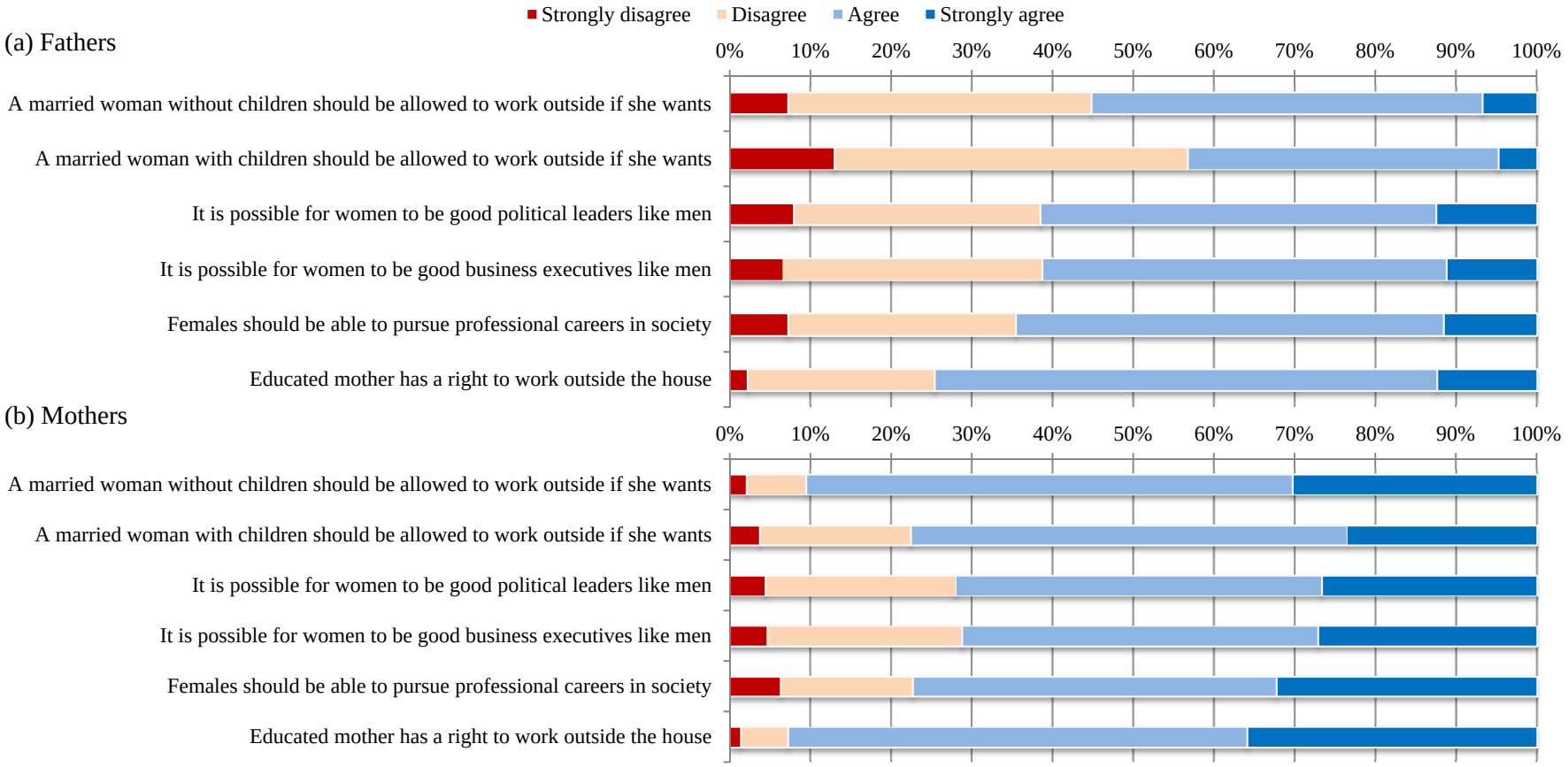
Source: 2011 JICA-RI/ERDC Survey
Note: The figure shows the proportion of school managers or parents who strongly agreed or disagreed with each statement. The responses of parents were given by those whose household had at least one non-enrolled girl aged 6 to 14. The number of observations is 40 for school managers, 233 for fathers and 268 for mothers.
[a] Included as a reason for the non-enrollment of girls aged 10 to 14 years only.

Figure 3. Attitudes toward girls' education by fathers and mothers



Source: 2011 JICA-RI/ERDC Survey
Note: The number of observations is 803 for fathers and mothers.

Figure 4. Attitudes toward women in the workforce by fathers and mothers



Source: 2011 JICA-RI/ERDC Survey
Note: The number of observations is 803 for fathers and mothers.

Appendix Table 1. Results of factor analysis for parental attitudes toward girl's education and women in the workforce

	Fathers	Mothers
(a) *Factor loadings on girls' education:*		
a1. Education is more useful for boys than girls.	-0.283	-0.383
a2. Today, girls need education as much as boys.	0.859	0.907
a3. Males and females have an equal right to receive education.	0.870	0.956
a4. Education may reduce "bride price."	0.393	0.383
a5. It is a violation for males & females to attend classes together at Grade 6 & above.	-0.049	-0.139
a6. Without female teachers, it is acceptable for girls to be taught by male teachers.	0.481	0.425
a7. Community appreciate graduated girls from secondary education.	0.600	0.391
a8. Because the fate of girls is marriage, girls do not need to learn.	-0.439	-0.420
Cronbach's alpha	0.661	0.681
Chi test	147.8***	338.6***
CFI	0.919	0.848
RMSEA	0.089	0.141
(b) *Factor loadings on women in the workforce:*		
b1. A married woman *without* children should be allowed to work outside the home if she wants.	0.567	0.599
b2. A married woman *with* children should be allowed to work outside the home if she wants.	0.502	0.518
b3. It is possible for women to be good political leaders like men.	0.831	0.918
b4. It is possible for women to be good business executives like men.	0.884	0.925
b5. Females should be able to pursue professional careers in society.	0.507	0.508
b6. Educated mother has a right to work outside the house.	0.648	0.695
Cronbach's alpha	0.792	0.820
Chi test	656.4***	777.6***
CFI	0.717	0.747
RMSEA	0.299	0.326

Note: The number of observations is 803 for fathers and mothers.

Appendix Table 2. Result of principal component analysis for household wealth index

	Mean	Component loadings
Wall: cut or regular stone	70%	0.071
Ceiling: concrete	15%	0.102
Number of rooms	3.2	0.263
Lighting: electricity	68%	0.276
Cooking source: wood	61%	-0.216
Water source: network connected	32%	0.253
on foot	20%	0.222
Water: minutes to fetch	36.1	0.293
Toilet: flushed	34%	0.315
non-flushed	46%	0.281
use other facility	4%	0.158
no toilet	16%	0.238
Assets: car	15%	0.050
gas stove	15%	0.008
refrigerator	15%	0.055
washing machine	13%	0.054
TV	61%	0.027
radio	43%	-0.100
mobile phone	60%	0.289
Animals: beehives	3%	-0.164
camels	1%	-0.226
chicken	31%	0.311
sheep/goats	28%	-0.164
cows	44%	-0.016
donkeys	61%	-0.171
Eigenvalues		3.73
Cumulative contribution rate		14.9%

Note: The number of households is 803.

Abstract (in Japanese)

要約

途上国における女子教育の阻害要因の一つとして、親の認識の低さが挙げられる。とりわけ、家父長制にもとづく社会規範によって女性の社会活動が制限されている地域では、親の女子教育に対する認識は低く、初等教育の機会に男女間で格差が存在することが指摘されてきた。本研究は、男女間の教育の格差解消が依然課題であるイエメンを対象国として、同国農村地域における家計および学校を対象にした調査をもとに定量的な分析を行った。本調査の特徴は、家計ごとに父親および母親から、児童の望ましい教育水準、女子教育に対する認識、望ましい結婚年齢、女性の労働に対する認識についてデータを収集しているところにある。

記述分析の結果、父親間および母親間でこれらの認識についてばらつきがあることが観察され、男子の望ましい教育水準について女子よりも高く答えている、すなわち son preference を持つと考えられる親が父親、母親共にある程度の割合で存在することが確認された。

またサンプルを 6 歳から 9 歳、10 歳から 14 歳に分けて行った女子の就学状況に関する回帰分析からは、高学年の女子に関して父親および母親が持つ望ましい教育水準や son preference が有意に関係していること、父親の認識に関してはさらに女子教育に対する認識、望ましい結婚年齢、女性の労働に対する認識が高学年の女子の就学と有意な関係にあること、低学年、高学年の女子ともに母親よりも父親の認識の方が女子の就学状況と相関が強いこと、女性教師の存在や教師の教育水準など学校側の要因も女子の就学に有意に影響していることが分かった。

Working Papers from the same research project

"Human Capital Formulation and Gender Equality in Conflict-Affected Islamic States: Case of Basic Education in Yemen"

JICA-RI Working Paper No. 73

Challenges of Quality of Learning Outcomes for Countries with the Unfinished Agenda of Universal Primary Education and Gender Parity: The Case of Yemen

Takako Yuki and Yuriko Kameyama