Inter-generational Co-residence, Women's Labor Force Participation and Leisure Time in Egypt

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Abstract

This paper examines the role of intergenerational co-residence on women's labor supply and leisure time using data on time allocation in Egypt. Data were collected from 548 women with a living mother-in-law, 291 co-residing and 257 not. Survey data included labor supply, fertility, a 24-hour time diary, and senior health assessment. Multivariate regression models predicted labor supply and leisure time use using standard models. Labor supply was decreased by co-residing with a disabled mother-in-law. Leisure consumption in the cohort was high at 4 hours per day and increased by 35 minutes per day by co-residing with non-disabled mother-in-law but unaffected by disabled mother-in-laws.

Key words: female labor supply, co-residence, Middle East/North Africa, Egypt, time-use, quality of life

1. Introduction

Women's labor force participation remains low in Egypt, with 27% of adult women in the labor force in 2006 (World Bank, 2010). Recently in some Islamic countries in the Middle East /North Africa (MENA) region, such as Morocco and Tunisia, female labor force participation (both in absolute and relative terms) has begun to increase, yet Egypt lags behind its neighbors (Assaad, 2004). Data from the World Bank suggests that Egypt is the only country in the MENA region in which rates of return on education in the private sector are not higher for women than for men (World Bank, 2004).

Past research has examined how structural adjustment programs that were aimed to facilitate economic liberalization failed to increase female labor force participation in Egypt as was expected. Instead, prior to 2006 there was a de-feminization of the labor market, which was most pronounced in urban areas (Assaad & El Hamidi, 2009). The dearth of women has been most pronounced in non-governmental and informal private sector markets.

Leading explanations for women's low labor force participation in Egypt focus more heavily on the structure of the demand for labor than factors influencing labor supply. Assaad (2004) suggests that part of the de-feminization of the labor market in Egypt is due to the structure of the economy, where there are limited blue-collar and textile industry jobs that are often the first point of entry for women into the labor market (Assaad, 2004). Unless private sector employers are discriminating against women, an exclusive focus on the demand for labor cannot explain why the proportion of women is markedly in government jobs than in private sector jobs. It seems plausible that there are supply side factors affecting the type of jobs that women in Egypt choose (Rauch & Kostyshak, 2009).

The concentration of women in the government sector can depress wages due to overcrowding. Research by Assaad and Arntz (2005) looked at Egyptian women's labor market participation in light of constrained geographic mobility, and suggested that educated young women's inability to commute (due to culture restrictions on women traveling) reduced their ability to join the non-governmental labor market (Assaad & Arntz, 2005). Past research in the MENA region has suggested that women are more likely to work outside the home if the men in her household have a positive view of female labor force participation (Antecol, 2003).

Along the lines of theories by Gary Becker, standard models of women's labor supply have focused on tradeoffs between leisure, formal sector labor and household labor. Care responsibilities in the home include raising children and later in the life course assisting seniors. In cultures with gendered childcare roles, including the Middle East, childcare responsibilities inhibit female labor force participation (The Arab Fund for Economic and Social Development, 2005; World Bank, 2004; Youseff, 1971). Assaad and Zouari (2003) found in Morocco that while marriage in itself does not reduce female labor force participation, bearing children, especially more than two, significantly reduces women's labor force participation, particularly in the non-governmental and private markets

(Assaad & Zouari, 2003). However, Hendy (2011) found that in Egypt marriage decreased a woman's time spent in the formal sector and increased her time spent on domestic work (Hendy, 2011). The first child increased a woman's time spent on domestic work by 20 hours a week and decreased the time spent in formal work by 1 hour a week (Hendy, 2011). Although there is an extensive and mixed literature on tradeoffs between caring for seniors and female labor force participation (Johnson & Sasso, 2006; Latif, 2006; Sasaki, 2002; Wakabayashi & Donato, 2005), there are very few studies of this topic in the Middle East and none in Egypt. In this paper we use an original dataset designed to shed light on the relationship between senior care and the supply of labor by Egyptian women in a semi-urban community.

The near future will bring a growing presence of senior kin in the households of working age women in Egypt. Higher fertility regimes of the past distributed the stewardship of parents and senior kin more widely among offspring. Within Egypt's aging population there will be more seniors and fewer younger adults raising the levels of exposure to seniors. Egypt's aging transition is in full swing, with 7.9% of females and 7.0% of males being aged 60 and over in 2010, and an old age support ratio (number of working aged people (aged 15-64) for each person over 65) projected to be 5 by 2050 (United Nations World Statistics Pocketbook). It will be important to understand how the growing exposure of current working-age populations to their senior kin will affect women's labor supply.

Across the life course parents have changing effects on the labor supply of their adult children. Most parents are in their 40s and 50s at the time their children are entering the labor force and starting families. At this phase they themselves could be working, but may have the flexibility to assist with the care of grandchildren and thereby facilitate labor supply by their daughters and daughters-in-law. The presence of parents with disabilities remains rare when women first become eligible to join the labor force, but senior parent disabilities grow in frequency later the life course. One would expect a transition in the intergenerational supply of caregiving. The parents of adults may first supply caregiving (for grandchildren) enabling young adult labor supply and then if disabilities ensue some seniors may demand care (for themselves) during their children's 4^{th} and 5^{th} decade.

Cultural expectations could impact seniors' willingness to help out or expect help. It is possible to imagine contexts where a mother-in-law could view the marriage of her sons as a chance to go into retirement and have her new daughter-in-law take over the bulk of domestic work. Evidence from India suggests that mothers-in-law feel it their duty and privilege to force their daughters-in-law to be overworked and to control her by restricting food intake, enforcing traditional norms, and maintaining power over her reproductive choices (Vatuk, 1998). Research from Egypt exploring the role of women of the life course finds that women of reproductive age do most of the labor, and mothers-in-laws do much of the childcare (along with young female children)(Lane & Meleis, 1991). Lane and Meleis (1991) assert that when a young married woman moves in with her mother-in-law, "daughters-in-law grow very lean, and mothers-in-laws grow plump in inverse proportion" (p. 1201)

The goal of this paper is to estimate how differences in formal labor supply for childbearing age women vary with co-residence disability status of her mother-in-law. Our interest in women's labor supply does not signify a desire to increase it or decrease it. The goal is to understand the patterns of female labor supply in Egypt because they are an important part of regional demography. Some argue that women's labor force participation does not necessarily improve women's life satisfaction, especially in countries with gender norms such as Egypt's (Olmsted, 2005). Other research in Egypt has found evidence that in communities that have a high percentage of women in the labor force, children overall have higher educational attainment, however, it appears that when the effects are explored for daughters and sons separately, girls attain lower educational levels in communities where more women work (Roushdy, 2007). The notion of gender equality in labor markets may be a "Western" construct and might not be appropriate for countries in the MENA region (Ahmed, 1992). This paper does not argue for any one perspective. Egypt faces looming demographic changes (growing and aging populations, and potentially changing household structures), which could have an impact on female labor force participation. Understanding the relationship between these factors today will help us best prepare for the changes Egypt will face in the decades to come.

2. Data and Methods

The study was conducted in a semi-urban part of Assiut city; Walideya district, in Upper Egypt. The housing stock is mainly 3 and 4 story walk up apartments with 1-2 apartment units per story. A preliminary enumeration and listing preceded the survey. The listing allowed determination of which women were 15-49 and co-residing with their mothers in law vs. 15-49 and not co-residing. Eligibility criteria for women to participate in the study were being currently married, 15-49 years of age, and having a living mother in law (MIL). Data were collected from 548 women; 291 co-residing with their MIL and 257 non co-residing. Mother-in-law co-residence was coded as either strict co-residence with a mother-in-law in the same apartment or quasi-co-residence with a mother-in-law in the same building, but not the same apartment. -in-law. Data collection took place between April and June 2010.

Women completed household rosters and questionnaires about basic demographic status, birth histories, relationship quality, how much their mother-in-law helped them in household tasks, and family assets. Additionally, women were instructed in how to complete a 24 hour time-diary including who was in the room with them at each time hour, and how long they spent in each activity. Women could record up to 4 activities per time period and up to 4 people in the room with them (husband, children/child, mother-in-law, other).

Additionally, the mothers-in-law co-residing with respondents were asked to fill out a questionnaire which included basic demographic questions, as well as questions about her reason for living with her son, her beliefs and desires for grandchildren, and how much she helps out her daughter-in-law around the house. She was also asked a set of questions taken from the World Health Organization Disability Assessment Schedule (WHODAS 2.0, shortened version), which asks about 6 domains of health and disability including

cognition, mobility, self-care, getting along, life activities (household and work) and social participation.

Studies of household structure present thorny problems in causal inference. The reasons any given household has its current members will be bound up with pre-existing choices on labor supply making it difficult to infer that it is the household structure that is the causal driver. The exclusion restrictions required to identify the dual processes governing household structure and labor supply are challenging to defend. Past scholars have asserted that the adult's number of siblings might predict co-residence with a disabled senior parent or in law but be excluded from predicting her labor supply (Johnson & Sasso, 2006). Similarly the adult's number of own children has been held to predict labor supply, but not co-residence with a disabled senior (Johnson & Sasso, 2006). This led us to explore the following system of equations:

[1] $\text{Work}_{it} = C_1\ b_1\ \text{Mother-in-law}_{it} + b_2\ X_{it} + b_3\ \text{Number of children} + e_{1it}$

[2] $\text{Mother-in-law}_{it} = C2 + g1X_{it} + g2\ \text{Number of husband's siblings}_i + e2_{it}$

We estimated this system using a bivariate probit model that assumed that e_{1it} and e_{2it} were distributed joint normal distribution with correlation ρ. As shown in Appendix 3 these estimates revealed that ρ was not statistically significant so we cannot assert that the systems estimator is superior. The rho statistic in the biprobit model had a $p=0.52$. Our preferred results are thus simple logistic estimates of equation [1].We also conducted a regression of the total number of children under 16 living in household on the number of minutes a day women spent in income generating work activities. Finally, we regressed the number of minutes spent in pure leisure time a day on the number of children under 16 living in the household. Time diary information was broken down into pure leisure time and non-leisure time. Pure leisure time was time spent only doing one (or more) of the activities designated as leisure (Appendix 1) and could not be a combination of a leisure activity with a non-leisure activity (like listening to music while cooking). A variable of pure leisure time was calculated as the total sum of all time spent only in unmitigated leisure time per 24-hour period.

All three of the analyses (time spent working per day, labor force participation in the last 3 months, and time spent in pure leisure per day) included age, years of school, wealth quintiles, a dummy for husbands occupational status being a professional (compared to all other occupations) or high executive and a dummy for husband's occupational status being retired (compared to all other occupations), number of children under 16 living in the household, number of adults 16-49 living in the household, and then four dummy variables for mother-in-law disability status. We included a dummy variable to account for different types of mother-in-law cohabitation ("Quasi MIL" status included women living in the same building, but not same apartment, as their MIL, and "Strict MIL" status included women living in the same apartment unit as their MIL. We also included the disability status of their mother-in-law. Using the standard scoring for WHODAS, a total disability score was calculated and from that a binary variable was constructed where

mother-in-law's with a disability score over 20 were classified as disabled (this represented the 75th percentile). Finally, we added a control for household wealth, in the form of dummy variables for wealth quintile score based on household assets.

We also included a set of variables related to the respondent's view of women's roles, her decision-making power, and her relationship quality. Marital relationship quality was a score based on a variety of questions about trust and commitment within in marriage. When listing household assets, the respondent was asked to identify whether she or her husband had purchased the item. We interpreted this as a measure of decision-making power. Therefore, two additional variables were created based on scores of the number of goods that the husband and wife each purchased in the household. Finally, the respondent answered a set of questions regarding the role of women, such as whether a woman's place is in the home, if a woman can both work and be a good mother, if girls and boys should have the same amount of schooling, etc. A variable was created as a score based on these questions. A high score reflected more conservative views about women's roles (for example, women should not work outside the home). See Appendix 2 for a list of these questions.

To test for the robustness of the model, we looked at 3 sets of variables. Model 1 removed the relationship quality question, model 2 removed the husband and wife's goods questions and Model 3 removed the view of women question.

3. Results

3.1 Description of Population and Time-Use

Women in the sample were on average 31 years old, ranging from 17-49 years old (Table 1). There was a statistically significant ($p<0.01$) difference between co-residing (either quasi or full) and non-co-residing women, with co-residing women being older. There was a statistically significant difference between co-residing and non-co-residing women in terms of both their children ever born and the total number of children under 16 living in their households ($p<0.01$ for both). Non-co-residing women lived with more children under 16 than co-residing women, and they had more children ever born. These are not necessarily completed fertility rates, since many of the women were still in prime childbearing years. The vast majority of women had completed school (71%), and there was no difference between co-residing and non-co-residing women. Thirty-three percent of non-co-residing and 24 percent of co-residing women had participated in the labor force in the past 3 months ($p<0.05$).

<Table 1>

Since time-use data in developing countries is rare, we wanted to provide a snapshot into what the daily life of married women in peri-urban Egypt is like. Women reported spending on average 8.3 hours a day sleeping and 1 and a third hours a day working in income generating activities. Women spent 19 minutes praying, about an hour on social

activities, and over 2 hours watching TV. On average, women spent one and a half hours caring for children, and 2 and a half hours preparing food (Table 2).

<Table 2>

Non-co-residing women spent more hours per day working than co-residing women ($p<0.05$). The average daily number of minutes spent in pure leisure time for co-residing women was 255 minutes (about 4 hours a day), with non-co-residing women having 37 minutes less leisure time ($p<0.01$). There was no different in assets score between the two groups of women.

3.2 Analyses

3.2.1 Time spent working per day

Increasing age and education level were both significantly associated with number of minutes spent working each day ($p<0.01$). Having a husband who was either retired or was a high executive/professional, compared to not being in those groups, increased the number of minutes spent working per day by about 35 and about 170 minutes a day, respectively ($p<0.05$). Living in the same building, but not the same apartment as a disabled mother in law decreased the number of working minutes a day by about 45 minutes a day ($p<0.1$). This became more significant ($p<0.05$) and larger (51 minutes) in model 3 (not controlling for view of women). A higher score on husband's control over decisions to purchase goods decreased time spent working by about 31 minutes a day ($p<0.05$) and having a less liberal view of women decreased work time by about 3 minutes a day ($p<0.05$). Relationship quality was only significant in model 3, when view of women's role was not controlled for. The three different models show that the full model is fairly robust (Table 3).

<Table 3>

3.2.2. Labor force participation

Age increased the odds of having participated in the labor force in the last 3 months by 1.13 ($p<0.01$) and education increased the odds by 1.14 ($p<0.01$). Being in the lowest or second lowest wealth quintiles decreased the odds of labor force participation to 0.35 and 0.43, respectively ($p<0.1$), in all models except Model 2, which did not include the variables for husband and wife purchasing of household goods. Having a husband who was either en executive or retired increased the odds of labor force participation by 1.55 and 9.14, respectively ($p<0.1$). Each additional child under 16 in the household decreased the odds of labor force participation by about 20% (Odds ratio=0.79, $p<0.05$). Living in the same building, but not same apartment, as a disabled mother-in-law reduced the odds of labor force participation by 70% (Odds ratio=0.30, $p<0.05$). A higher score for how many goods the wife purchased in the household increased the odds of labor force participation (OR=1.55, $p<0.05$) and a higher score for how many goods the husband purchased decreased the odds of labor force participation (OR=0.44, $p<0.01$). The less liberal view of woman the respondent had, the less likely she was to have participated in the labor force in the past 3 months (OR=0.95, $p<0.05$). Finally, each additional point on

the relationship quality scale decreased the odds of labor force participation (OR=0.98, $p<0.01$) (Table 4).

<Table 4>

3.2.3 Time spent in leisure per day

Education level decreased a woman's number of minutes spent in leisure a day by about 4 minutes ($p<0.05$). Being in the second poorest wealth quintile also increased leisure time by about 50 minutes a day ($p<0.1$). Having more children under the age of 16 living in the household also decreased the number of leisure minutes, but about 2 minutes ($p<0.01$). Living in the same building, but not the same apartment, as a non-disabled mother-in-law increased daily leisure time by about 35 minutes ($p<0.05$). The full model was robust (Table 5).

<Table 5>

4. Discussion

Women who live with in the same building or apartment unit with their mother-in-law differ substantially from those who do not. Non-co residing women were younger, had more children, and were more likely to have participated in the labor force in the last three months. They also spent more minuets working a day and fewer minutes in leisure. Mothers-in-law may either suppress working and allow for more leisure, or women who wish to join the labor force may not choose to live with their mothers-in-law. If we assume that women have limited choice in their co-habitation status, then the former explanation would be more likely. Every co-residing woman who lived with their mother-in-law reported doing so for the whole time that they were married. Therefore, the age differential seen between co-residing and non-co-residing women is not reflective of a trend of younger couples living alone and then moving in with their in-laws later in life. Women appear to either co-reside always, or never co-reside.

Women who were living in the same building, but not the same apartment ("quasi-co-residing") with their disabled mother-in-law were both less likely to have participated in the labor force in the last 3 months and spent fewer minutes working each day. Conversely, women who lived in the same building but not the same apartment as their mother-in-law and she was not disabled, had more minutes of leisure time a day. We posit that both of these would have been the same for mothers-in-law living in the same apartment, but that the samples were too small to detect any effects (N=28). It appears that living nearby a healthy mother-in-law is beneficial, but having the burden of care taking for a disabled, co-residing mother-in-law can reduce women's freedom. This suggests that mothers-in-law can be positive or negatively associated with labor supply, depending on the health of the mothers-in-law.

Our findings support past literature that suggests that mothers-in-laws help care for young children, as women who lived with their healthy mothers-in-law had more leisure time (Lane & Meleis, 1991). However, it is clear that having a disabled mother-in-law adds work to women's lives, supporting past literature arguing that mothers-in-law make their daughters-in-law work for them and work harder (Lane & Meleis, 1991). Interestingly,

co-residing with a mother-in-law at a basic level does not make women work harder, it is only when that mother-in-law is disabled that the burden increases. Past literature has suggested that one of the jobs of a mother-in-law is to enforce "traditional" gender norms on her daughter-in-law, and we find evidence of this in co-residing daughters-in-law being less likely to join the labor force and working fewer minutes a day (Vatuk, 1998). Of course, more "traditional" women may marry more "traditional" men, who then make a choice to move in with the husband's family, and are therefore already less predisposed to work outside the home. In the case of Egypt, marital matching norms may lead more traditional families to marry their children to each other, thereby insuring that more "traditional" mothers-in-law have more "traditional" daughters-in-law.

Having more children under 16 living in the household both decreased the odds of labor force participation in the last 3 months, and decreased the number of minutes of leisure time a day. Number of children under 16 in the household did not affect minutes of time spent working for income a day. These findings are not surprising, as we would expect that having more children to care for would restrict a woman's ability to leave the home and enter the formal labor force, and also require more time inputs in the home, thereby reducing leisure time. Past literature in the Arab world has also found that fertility has a negative on labour force participation (Al-Qudsi, 1998; Hendy, 2011).

Measures of women's role attitudes, empowerment and decision-making were associated with labor force participation and number of minutes a day spent working. A higher score on the measure of having a non-liberal view of women's roles decreased both the odds of labor force participation and the number of minutes per day spent working. This score is made up of questions that include questions directly related to the role of women in the work place; therefore, this shows that values about women's role influence behaviors. The greater the number of goods in the household that the husband purchased, the lower the odds of labor force participation and the fewer number of minutes a woman worked. This may be reflective of men having more power in household dynamics than women, and women therefore having less autonomy outside of the home. Interestingly, an increasing number of goods that were purchased by the woman increased odds of labor force participation, however, it did not significantly impact minutes of day spent working. It is possible these are simple correlated, or that one causes the other, for example, perhaps when women work outside the home, they gain other types of empowerment that allows them to purchase goods that they wanted, or perhaps the same type of women that works would be more assertive in the household.

Past social survey research on gender equality attitudes around the world found that a large number of Egyptian respondents were comfortable with statements of gender inequality. Egypt stands out in this regard even among conservative or predominantly Muslim countries. For example, only 10% of people in Egypt disagreed with the statement "men make better political leaders than women", compared to about 25% disagreeing in Iran and about 30% disagreeing in Morocco (Inglehart & Norris, 2003). Our findings suggest that expressing these types of gender values is statistically associated with reduced female labor force participation.

A higher score on the relationship quality measure (better relationship quality) reduced the odds of female labor force participation, however, it did not impact minutes of formal

sector work per day significantly, except when the variable for a non-liberal view of women was not included in the model. This may suggest that women have a more positive view of their relationship when they are not working, or that in households where the couple has a better relationship, women are able to request to not work, assuming they do not want to. It is possible that in more "conservative" or "traditional" homes, where women are less likely to work, women also feel pressured to answer relationship quality questions in a more positive manner. The fact that this indicator becomes significant in the first analysis of time spent working a day when the variable about the view of the role of women is not included provides support for that hypothesis.

There is very little research in Egypt on marital relationship quality, and the research that does exist examines relationship quality in the light of other factors (for example infertility, sexual dysfunction, or migration). One study of Israeli-Arabs found that Muslims reported lower relationship quality than their Christian or Druze counterparts (Lev-Wiesel & Al-Krenawi, 1999). Our findings suggest that there is an association between relationship quality and labor force participation, and more research into the causality of this association would be useful.

4.1 Limitations

Based on past information on how co-residing occurs in rural Egypt, we had hoped that husband's birth order would have a strong association with co-residing so that it could be used as an instrumental variable that affected women exogenously. However, we found no association between husband's birth order and co-residence in peri-urban settings. We consequently abandoned plans to use an IV strategy to identify causal effects of co-residence.

The cross-sectional nature of this study, does not allow us to disentangle the causal direction of the relationship between co-residence and women's labor supply. Follow-up data, making this a longitudinal study, will be collected in the next year. If there are household structure transitions they will allow us to better understand the directionality of some of these associations.

Time-use data was only collected on one week-day in the life of each women. Reported time use would not capture activities that were important, but that did not occur each week day. Better time-use data would be able to capture information about how women spend their time over a matter of days, so as to even out any unusual patterns due to the day of the week or other factors.

Data about mothers-in-law was only collected about the co-residing mothers-in-law (quasi and strict) and therefore we do not have information about the disability status of the mothers-in-law who do not co-reside. If mothers-in-law who are disabled, but do not co-reside, impact the time use and labor force participation of their daughters-in-law in the same way as co-residing mothers-in-law impact their daughters-in-law, then we are over-estimating the effect of mothers-in-law.

5. Conclusions

Co-residence with a healthy mother-in-law is a positive benefit for women in peri-urban, Egypt, as they have more leisure time than non-co-residing women and their labor force participation is not affected. However, if women happen to live with a disabled mother-in-law, leisure time is reduced as women have to care for the disabled mother-in-law. With increasing life expectancies around the world, including in Egypt, we are likely to see more and longer co-resident situations. If the time spent in disability increases, women in Egypt are likely to be adversely effected in the years to come as they have to spend more time in the household.

Additionally, it appears that mothers-in-law negatively impact the likelihood of women participating in the labor force. This may be through self-selection or the imposition of more traditional roles by seniors. In any case, based on recent fertility declines in Egypt coming generations of wives will face increasing co-residence with their mothers-in-law (in terms of duration and magnitude). To the extent that some mothers-in-law will be disabled, women's labor force participation in Egypt is likely to remain at low levels. The persistence of tolerant views towards gender inequality (perhaps reinforced by co-residence and higher exposure to the older generation's point of view) will be coherent with a low cultural desire of women to be in the work force, despite high levels of female educational status, falling fertility and relatively large amounts of free time that could be spent in income generating activities.

While declining fertility and high levels of women's education could open the door to increased female labor force participation in Egypt, cultural factors such as more traditional views of women's roles still exist. Changing demographic patterns that will lead to increasing co-residence may act to strengthen these attitudes, especially if there is an extension of disability causing the aging population to live more years in a disabled state, requiring increasing demands for care.

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Ethical Standards: This research complies with the current laws in the country it was preformed (Egypt) and received IRB approval from Assuit University, Upper Egypt.

Table 1: Demographics of Women in Sample

	Non co-residing women 257 (46.9) N(%)	Co-residing women 291 (53.1) N(%)
Age in years		
<20	3 (1.17)***	7 (2.41)
20-29	96 (37.35)	141 (48.45)
30-39	107 (41.63)	100 (34.36)
>=40	51 (19.84)	43 (14.78)
Total number of children under 16 in household		
0	25 (9.73)***	40 (13.75)
1-2	119 (48.30)	115 (53.26)
3-4	98 (38.13)	84 (28.87)
5+	15 (5.84)	12 (4.12)
Total Number of children ever born		
0	18 (7.00)***	38 (13.06)
1-2	100 (38.91)	131 (45.02)
3-4	106 (41.25)	89 (30. 58)
5+	33 (12.84)	33 (11.34)
Educational Status		
Currently in School	4 (1.57)	7 (2.42)
Completed School	185 (72.55)	204 (70.59)
Dropped out of School	49 (19.22)	48 (16.61)
Never Went to School	17 (6.67)	30 (10.38)
Participated in labor force in past 3 months (Yes)	85 (33.07)**	70 (24.05)
Time spent in work (income generating) (mean minutes per day)	102.65**	68.67
Pure Leisure time (mean minutes per day)	218.38***	255.2
Asset Score (mean)	0.12	-0.03

** p<0.05 between the groups as a whole

***p<0.01 between the groups as a whole

Table 2: Time Use of a selection of activities that people spend most of their time in

Activity	**Mean time per Day (minutes)**	**SD**
Sleep	498.5	136.90
Praying	19.05	43.75
Working	77.86	160.07
Food Preparation	154.67	86.30
Caring for children	93.60	176.59
Social	61.00	112.42
TV	124.81	110

Table 3: OLS models of Number of minutes a day spent working in formal sector

	Model 1	**Model 2**	**Model 3**	**Full Model**
Age in years	5.821***	5.736***	6.128***	5.970***
	[4.971]	[5.007]	[5.252]	[5.129]
Education in Years	6.949***	7.185***	7.370***	7.121***
	[3.559]	[3.766]	[3.780]	[3.662]
Wealth quintile 1	-46.719	-1.657	-40.831	-41.819
	[-1.481]	[-0.069]	[-1.293]	[-1.329]
Wealth quintile 2	-40.371	-10.942	-38.499	-36.305
	[-1.529]	[-0.482]	[-1.451]	[-1.373]
Wealth quintile 3	-6.810	18.311	0.961	1.240
	[-0.281]	[0.810]	[0.039]	[0.051]
Wealth quintile 4	-10.100	5.452	0.160	-3.193
	[-0.456]	[0.252]	[0.007]	[-0.144]
Husband Occupation: Executive, professional with high degree	30.852**	34.614**	33.788**	34.779**
	[2.017]	[2.266]	[2.212]	[2.285]
Husband Occupation: retired	157.984**	157.249**	173.965**	168.914**
	[2.226]	[2.227]	[2.463]	[2.401]
Number <16 in Household	-4.804	-6.793	-5.403	-5.673
	[-0.878]	[-1.240]	[-0.983]	[-1.036]
Number 15-64 in household	-6.395	-7.932	-7.364	-7.109
	[-0.839]	[-1.039]	[-0.964]	[-0.935]
Quasi MIL, not disabled	-13.384	-12.943	-12.463	-10.399
	[-0.880]	[-0.847]	[-0.817]	[-0.683]
Strict MIL, not disabled	-36.084	-31.950	-30.263	-30.555
	[-0.909]	[-0.806]	[-0.764]	[-0.775]
Quasi MIL, disabled	-45.670*	-45.989*	-51.389**	-46.208*
	[-1.918]	[-1.923]	[-2.162]	[-1.943]
Strict MIL, disabled	-76.194	-85.558*	-77.411	-76.887
	[-1.519]	[-1.719]	[-1.552]	[-1.548]
Number goods wife purchased in household	20.122		21.624	22.009
	[1.377]		[1.478]	[1.510]
Number goods husband purchased in household	-29.270**		-31.061**	-31.043**
	[-2.036]		[-2.159]	[-2.166]
Non-liberal view of women's role score	-3.911***	-3.102**		-3.017**
	[-2.962]	[-2.321]		[-2.268]
Relationship quality score		-0.753	-0.865*	-0.748
		[-1.514]	[-1.752]	[-1.512]
Constant	62.983	-52.813	-24.696	48.374
	[0.800]	[-0.865]	[-0.338]	[0.608]
t-statistics in brackets *** p<0.01, ** p<0.05, * p<0.1				

Table 4: Log Odds of Labor Force Participation in the past 3 months in Logistic Models

	Model 1	**Model 2**	**Model 3**	**Full Model**
Age in years	0.125***	0.117***	0.129***	0.130***
	[5.617]	[5.373]	[5.737]	[5.727]
Education in Years	0.244***	0.247***	0.262***	0.260***
	[5.279]	[5.364]	[5.490]	[5.432]
Wealth quintile 1	-1.105**	-0.385	-1.015*	-1.064*
	[-1.979]	[-0.904]	[-1.805]	[-1.879]
Wealth quintile 2	-0.922**	-0.449	-0.878*	-0.848*
	[-2.033]	[-1.164]	[-1.900]	[-1.834]
Wealth quintile 3	-0.201	0.222	-0.029	-0.052
	[-0.506]	[0.601]	[-0.071]	[-0.127]
Wealth quintile 4	-0.036	0.212	0.172	0.114
	[-0.103]	[0.629]	[0.486]	[0.318]
Husband Occupation: Executive, professional with high degree	0.418	0.442*	0.432*	0.439*
	[1.617]	[1.717]	[1.648]	[1.658]
Husband Occupation: retired	1.984*	1.917	2.284*	2.213*
	[1.679]	[1.563]	[1.887]	[1.847]
Number <16 in Household	-0.194**	-0.260***	-0.222**	-0.233**
	[-1.975]	[-2.590]	[-2.188]	[-2.285]
Number 15-64 in household	-0.214	-0.266*	-0.238	-0.233
	[-1.387]	[-1.713]	[-1.518]	[-1.484]
Quasi MIL, not disabled	-0.067	-0.011	0.003	0.040
	[-0.261]	[-0.041]	[0.010]	[0.149]
Strict MIL, not disabled	-0.777	-0.732	-0.725	-0.670
	[-0.883]	[-0.841]	[-0.835]	[-0.753]
Quasi MIL, disabled	-1.160**	-1.055**	-1.230***	-1.191**
	[-2.484]	[-2.307]	[-2.604]	[-2.509]
Strict MIL, disabled	-1.946	-1.877	-1.716	-1.810
	[-1.495]	[-1.390]	[-1.307]	[-1.386]
Number goods wife purchased in household	0.602**		0.656**	0.669**
	[2.358]		[2.518]	[2.544]
Number goods husband purchased in household	-0.757***		-0.818***	-0.829***
	[-2.977]		[-3.144]	[-3.172]
Non-liberal view of women's role score	-0.077***	-0.054**		-0.056**
	[-3.164]	[-2.204]		[-2.267]
Relationship quality score		-0.022**	-0.026***	-0.023***
		[-2.489]	[-3.016]	[-2.590]
Constant	-2.838**	-4.559***	-4.348***	-3.077**
	[-2.000]	[-3.993]	[-3.278]	[-2.150]
z-statistics in brackets *** p<0.01, ** p<0.05, * p<0.1				

Table 5: OLS models of Daily Total leisure time (minutes)

	Model 1	**Model 2**	**Model 3**	**Full Model**
Age in years	-1.261 [-1.037]	-0.958 [-0.799]	-1.270 [-1.039]	-1.192 [-0.973]
Education in Years	-4.387** [-2.164]	-4.552** [-2.281]	-4.435** [-2.172]	-4.312** [-2.108]
Wealth quintile 1	29.852 [0.911]	19.990 [0.794]	34.286 [1.036]	34.775 [1.051]
Wealth quintile 2	43.387 [1.582]	40.953* [1.725]	50.775* [1.826]	49.690* [1.786]
Wealth quintile 3	4.259 [0.169]	2.467 [0.104]	8.477 [0.331]	8.339 [0.326]
Wealth quintile 4	5.732 [0.249]	5.200 [0.230]	6.012 [0.258]	7.669 [0.329]
Husband Occupation: Executive, professional with high degree	11.553 [0.727]	11.723 [0.734]	11.673 [0.729]	11.184 [0.699]
Husband Occupation: retired	-35.328 [-0.479]	-30.935 [-0.419]	-40.319 [-0.545]	-37.822 [-0.511]
Number <16 in Household	-21.442*** [-3.773]	-19.014*** [-3.318]	-19.916*** [-3.460]	-19.782*** [-3.436]
Number 15-64 in household	12.372 [1.563]	13.400* [1.678]	13.245* [1.656]	13.119 [1.640]
Quasi MIL, not disabled	37.658** [2.384]	35.832** [2.242]	35.539** [2.224]	34.520** [2.156]
Strict MIL, not disabled	-0.516 [-0.013]	-4.049 [-0.098]	-5.063 [-0.122]	-4.918 [-0.119]
Quasi MIL, disabled	34.743 [1.405]	36.404 [1.455]	38.966 [1.565]	36.405 [1.456]
Strict MIL, disabled	-48.807 [-0.937]	-44.063 [-0.846]	-47.337 [-0.906]	-47.596 [-0.911]
Number goods wife purchased in household	-19.136 [-1.261]		-17.536 [-1.144]	-17.727 [-1.156]
Number goods husband purchased in household	21.842 [1.463]		20.965 [1.391]	20.956 [1.390]
Non-liberal view of women's role score	1.666 [1.215]	1.518 [1.086]		1.491 [1.066]
Relationship quality score		0.628 [1.208]	0.680 [1.315]	0.622 [1.196]
Constant	224.067*** [2.740]	234.657*** [3.675]	233.489*** [3.051]	197.376** [2.359]
t-stat in brackets *** p<0.01, ** p<0.05, * p<0.1				

Appendix 1: Categorization of Daily Activities into Leisure and Non-Leisure

Leisure	**Non-Leisure**
Rest/doing nothing	Sleep
Chatting	Eating and Drinking
Services to the community and helping others	Personal cleanliness and health
Social or other family visits	Meditation/Praying
Participating in cultural activities	At work
Other similar recreational, social, cultural activities	Commuting to work
Reading	Income generating home activities
Watching TV or video	Commuting for Income generating home activities
Listening to music or radio	Food preparation and related activities
	Housekeeping
	Laundry and other activities related to
	Shopping for household needs, not personal
	Managing household bills
	Pet care
	Commuting for household management
	Caring for children physical, bathing
	Tutoring, training, children
	Accompanying children to places
	Physical care for sick children, disabled persons
	Accompanying elderly to receive personal care

	Supervising or watching elderly
	Other services to children, elderly, disabled
	Commuting services related to care for elderly, children
	Getting education
	Commuting to get educational services
	Participating in religious ceremonies
	Receiving personal or health care from someone
	Other activities related to personal care
	Commuting for personal care
	Commuting to perform community services
	Commuting related to social, recreation
	Other

Appendix 2: List of Questions included in the View of Women's Role Composite variable

List of Questions included in the View of Women's Role Variable
Are you often or generally afraid of disagreeing with your husband (father/brothers) or other males in your household?
A woman's place is not only in the household but also in the workplace
If the wife has a job outside of the house then the husband should help her with the children
If the wife has a job outside of the house then the husband should help her with the household chores
A thirty year old woman who has a good job but is not yet married is to be pitied
Girls should go to school to prepare for jobs not just to make them good mothers and wives

Girls should go to school to prepare for jobs not just to make them good mothers and wives
A woman who has a full time job (8am-5 pm) cannot be a good mother
For a woman's financial autonomy she must work and have earnings.
Having a fulltime job always interferes with a woman's ability to keep a good life with her husband.
Women should continue to occupy leadership positions in society.
Boys and girls should get the same amount of schooling,
Boys and girls should be treated equally

Appendix 3: Biprobit model of labor force participation and co-residence with a mother in law

	Coef.	SE	z	P>|z|	Lower 95% CI	Upper 95% CI
Labor Equation						
Age in years	0.07	0.01	4.59	0.00	0.04	0.09
Education in years	0.13	0.03	4.92	0.00	0.08	0.18
Wealth quintile 1	-0.54	0.31	-1.74	0.08	-1.15	0.07
Wealth quintile 2	-0.49	0.26	-1.86	0.06	-1.00	0.03
Wealth quintile 3	-0.13	0.23	-0.56	0.58	-0.58	0.32
Wealth quintile 4	0.00	0.21	0.02	0.98	-0.41	0.42
Husband Occupation: Executive, professional with high degree	0.29	0.15	1.98	0.05	0.00	0.59
Husband Occupation: retired	1.07	0.63	1.71	0.09	-0.16	2.31
Number <16 in HH	-0.14	0.06	-2.49	0.01	-0.25	-0.03
Number 16-64 in HH	-0.14	0.08	-1.65	0.10	-0.30	0.03
Number goods wife purchased in household	0.35	0.15	2.40	0.02	0.06	0.64
Number goods husband purchased in household	-0.42	0.15	-2.86	0.00	-0.71	-0.13

	Relationship quality score	-0.01	0.00	-2.38	0.02	-0.02	0.00
	Non-liberal view of women's role score	-0.04	0.01	-2.68	0.01	-0.07	-0.01
	Quasi MIL, disabled	0.51	1.00	0.51	0.61	-1.45	2.48
	Constant	-1.43	0.81	-1.76	0.08	-3.02	0.17
Mother in Law Equation							
	Age in years	0.03	0.01	2.59	0.01	0.01	0.06
	Education in years	0.02	0.02	0.87	0.39	-0.02	0.06
	Wealth quintile 1	0.38	0.36	1.05	0.29	-0.33	1.08
	Wealth quintile 2	0.06	0.33	0.18	0.86	-0.58	0.70
	Wealth quintile 3	0.48	0.29	1.64	0.10	-0.09	1.06
	Wealth quintile 4	0.39	0.28	1.41	0.16	-0.15	0.94
	Husband Occupation: Executive, professional with high degree	-0.33	0.19	-1.78	0.08	-0.70	0.03
	Husband Occupation: retired	-4.67	1645.56	0.00	1.00	-3229.91	3220.58
	Number 16-64 in HH	0.07	0.08	0.85	0.40	-0.09	0.23
	Number goods wife purchased in household	-0.02	0.17	-0.09	0.93	-0.36	0.32
	Number goods husband purchased in household	-0.01	0.17	-0.07	0.95	-0.34	0.32
	Relationship quality score	0.00	0.01	-0.50	0.61	-0.01	0.01
	Non-liberal view of women's role score	0.03	0.02	1.61	0.11	-0.01	0.06
	Number of brothers husband has	-0.03	0.05	-0.66	0.51	-0.13	0.06
	Constant	-3.14	0.92	-3.41	0.00	-4.95	-1.33
	/athrho	-0.63	0.64	-0.98	0.33	-1.89	0.63
	rho	-0.56	0.44	-0.96	0.56		
Prob >chi2					0.522		

Appendix 4: Imputations of missing data

	Full		Imputed		Insample	
	Mean	Obs	Mean	Obs	Mean	Obs
All work time	84.61	548			82.13	503
Leisure time	237.94	548			237.79	503
Labor force participation	0.28	548			0.28	503
Age in years	31.53	548			31.52	503
Education in years	10.32	544	10.32	548	10.43	503
Wealth quintile 1	0.2	548			0.2	503
Wealth quintile 2	0.2	548			0.2	503
Wealth quintile 3	0.2	548			0.2	503
Wealth quintile 4	0.2	548			0.21	503
Husband Occupation: Executive, professional with high degree	0.46	512	0.45	532	0.46	503
Husband Occupation: retired	0.0009	512	0.01	532	0.009	503
Relationship Quality Score	25.32	539	25.31	548	25.23	503
Number <16 in HH	2.15	544	2.16	548	2.1	503
Number 16-64 in HH	2.53	538	2.53	548	2.46	503
Quasi MIL, not disabled	0.39	548			0.39	503
Strict MIL, not disabled	0.03	548			0.032	503
Quasi MIL, disabled	0.095	548			0.099	503
Strict MIL, disabled	0.018	548			0.012	503
Number goods wife purchased in household	9.07	548			9.09	503
Number goods husband purchased in household	9.57	548			9.59	503
Non-liberal view of women's role score	24.3	548			24.36	503

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