CHAPTER 4

Socio-demographic Factors Affecting Household Size

Hiromichi Sakai

1. INTRODUCTION

There are many studies of fertility and child mortality for developing countries (Freedman and Blanc 1991, Sullivan 1991). By contrast, there are few demographic studies on household and family for those countries. But such studies are very important because these may be helpful to:

1. clarify change of household and family formation brought about by demographic transition;
2. supply basic data for a branch of life course studies;
3. be of use for population and household projections; and
4. make clear living arrangements of parents and of their children.

It is considered that what we must first cope with on household and family is to know composition of a household and a family, which are demographically and culturally determined. And first of all, we must know the size of household, which is one of the most fundamental information.

Generally in many developed and developing countries, the fertility and mortality continue to decline. And the size of household reflects both facets of demographic transition. But while fertility declines bring about the smaller households, mortality declines bring about the bigger households, other things being equal. In reality in most of all the countries ths size of household has become smaller. So the effect of fertility decline is over that of mortality decline in terms of the size of household. Besides, the size of household is thought to affect demographic transition, that is, the probability of birth and death is somewhat dependent on the size of household. Overall, the relationship between the size of household and demographic transition is very complicated, however, it is thought to be a fertile study area for demography.

Results and implications of household and family studies for developing countries are concerned with not only demographic researches but also social policies. So we focus on the size of household and family for developing countries by using DHS data.

First we must define the concept of household and family. "Household" is defined as "a person or a group of people who usually live and eat together and are not necessarily family" (DHS, 1987, Interviewer's Manual). "Family" is defined to be a blood or marriage related group. The definition of "household" is very clear, but the definition of "family" is not so clear as "household". Its definition does not include a scope of relatives, for example, is a grandson or a cousin a family? And once it is defined uniquely, its relativity remains. That is, a range of one's family is different from that for the other member of the same family. For example, there is a big difference of extension of family between from husband's point of view and from that of wife's.

But we have to adopt an operational definition of family. So we define it from couple's point of view. Because a couple is a most fundamental unit of family. A family usually consists of a couple and its children (and grand children and parents and grandparents in the same household). We suppose that children of couples out of household are members of a family, but parents, grandparents, grandchild(ren) out of a household are not members of a family. Sibling of couples and cousin are excepted from our definition even if they are living in the same household. Our definition stresses parent-child (ren) relationship. Our schematic definition of family and household is shown on Draw 1.

Regrettably not enough information about relationship of household members to the head of household is obtained in the DHS individual record file, of which we make use. So information of household members cannot help being roughly divided into two parts; children and the others which include the couples. Though the category is very simple, its categorization is necessary and enough to explore size of household, which is determined from norm of family and household forma-

Map 1 Basic Statistics for Selected Countries

EGYPT 1988-89, N=8911
  TFR=4.4, UFM=73
  UR=44, ED=23

THAILAND 1987, N=6775
  TFR=2.2, UFM=36
  UR=18, ED=14

GHANA 1988, N=4488
  TFR=6.4, UFM=77
  UR=34, ED=39

BRAZIL 1987
  N=5892, TFR=3.3
  UFM=85, UR=76
  ED=34
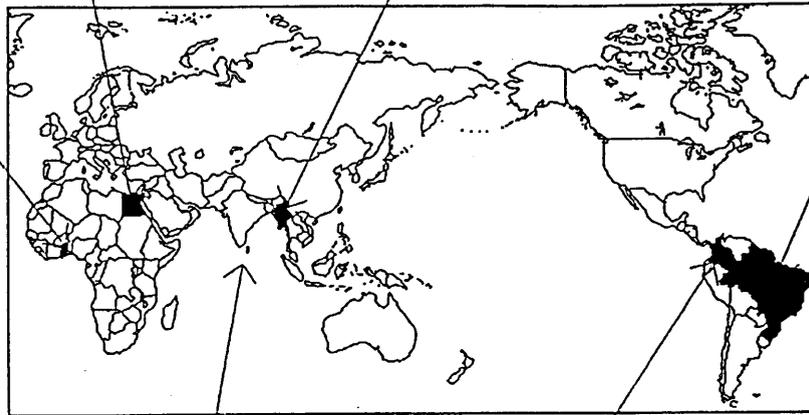
SRI LANKA 1987 N=5865
  TFR=2.6, UFM=25
  URE=16, ED=69

COLOMBIA 1990, N=8664
  TFR=2.9, UFM=27
  UR=75, ED=72

(NOTES)
    TFR:TOTAL FERTILITY RATE
   UFM:UNDER FIVE MORTALITY DEATHS PER 1000 BIRTHS
    FOR: THE PERIOD 0-4 YEARS PRECEDING THE SURVEY
    UR:PERCENT URBAN
    ED:PERCENT COMPLETED PRIMARY SCHOOL OR MORE
(SOURCE) SELECTED DHS STATISTICS, 1991

Draw 1 Couceptual Scheme of Household and Family
from Couple's Point of View

CHILDREN
AT HOME

OTHERS
  COUPLE
  PARENTS
  GRANDCHILDREN
  OTHER RELATIVES
  NON RELATIVES

PARENTS

COUPLE'S SIBLING

CHILDREN OUT OF HOUSEHOLD

FAMILY

GRANDCHILDREN

HOUSEHOLD
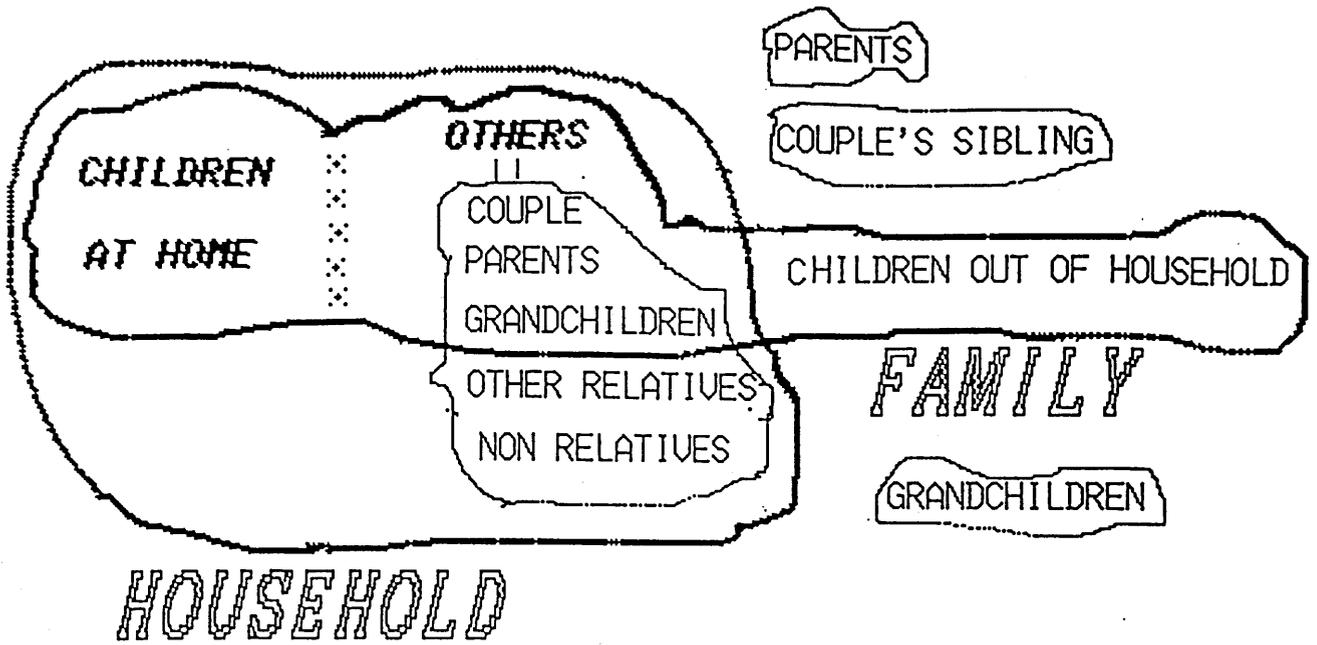
tion. And its category is useful for fertility survey.

2. DATA

WFS and DHS reports show a big continental differential on child mortality and fertility and their change (WFS 1984, DHS 1991). Sakai (1992) claims that in studying relationship between urbanization and fertility, we first classify relevant data by continent. That is because urbanization and demographic phenomenon have the synchronic change.

So we choose two developing countries from each continent; Egypt and Ghana from Africa, Colombia and Brazil from Latin America, and, Sri Lanka and Thailand from Asia. We show basic demographic information of each country on Map 1.

Our interest lies in household and family defined before, especially the size and composition of a household. So we limited our sample by selecting respondents who are married or living together with their partners. Variables to be examined are respondent's age, type of respondent's residence and educational attainment. We intended to include the variable, occupation of husbands of the respondents, but unfortunately these data are in many cases incomplete in DHS and we regard that the respondent's residence can be an alternative of the husband's occupation. So by using these three key variables we will study a size of household.

3. A COMPARATIVE ANALYSIS CONTROLLING NO OTHER VARIABLES

Figure 1 shows mean size of a household dividing into mean number of couple's children in a household and that of the others in a household. It spreads from 5.1 persons in Brazil to 7.1 in Egypt. In all the six countries except Brazil, mean number of the others in a household is bigger than that of children in a household. So this data implies that the presence of the others in a household contribute much to the size of household as well as children in a household.

Comparing the two countries within each continent, We find that Egypt rather than Ghana, Brazil rather than Colombia and, Sri Lanka rather than Thailand shows bigger effect of children in a household than others in a household in determining size of household.

4. A COMPARATIVE ANALYSIS CONTROLLING RESIDENCE, AGE AND EDUCATIONAL ATTAINMENTS

Noting urban-rural difference of mean household size, only Sri Lanka has bigger mean number of household in urban area than in rural area (Figure 2). In Egypt,

Colombia and Brazil the situation is reverse, that is, the rural houseohld sizes are relatively bigger than that of urban. The residential difference in Egypt is brought about by mean number of the others in a household rather than mean number of children in a household. In Colombia and Brazil the difference is brought about by mean number of children in a household rather than mean number of others in a household. In Sri Lanka urban mean number of children in a household is larger than that of rural, but urban mean number of the others in a household is smaller than that of rural.

Figure 3 shows differential of mean household size by the age of respondents. Its distribution varies across countries. In Brazil mean household size is proportionate with age.

In Egypt, Colombia, Sri Lanka and Thailand the 15-19 year-old group shows the highest size of household followed by the 20-24 year-old group with most composition due to the presence of 'others' in the household. This is because in six countries nuclear family formation has not yet been promoted very much. And the 25-29 year-old group which is most fertile shows smallest mean size of household in the four countries.

We show for reference an example of Japan whose respondents are married, which displays an inverted U-shaped curve, its top formed by 30-34 year-old group (Figure 4). The curve is contrast compared to that of the six countries under comparison, which show mostly U-shaped curve. Developed countries like Japan, which have achieved nuclearization of most of families, that is, one who lives with one's parents until she/he is married and makes an independent household from their parents and has child birth, appear to show the inverted-U shaped curve.

In every country, as the age increases, mean number of children in a household increases and the 'others' in a household decreases. In Egypt and Ghana 40-44 year-old group shows the biggest mean number of children in a household and 45-49 year-old group shows decline of mean number of children in a household. Perhaps this will be explained by the difference of age at marriage of children by country.

Figure 5 shows differential of educational attainment for mean size of household. In Egypt, Colombia and Brazil the difference among all the categories is very clear and educational attainment is disproportionate with mean size of household. Ghana, Sri Lanka and Thailand show the same but weak tendency.

Educational attainment has much effect on mean number of children in a household but little effect on mean number of 'others' in a household. In Sri Lanka and Thailand higher ecuational attainment has little relation with mean number of the 'others' in a household. Higher education shows larger mean number of the

Figure 1 Mean Household Size

(persons)

Legend: OTHERS, CHILDREN

Values shown (OTHERS / CHILDREN):
- EGYPT: 4.8 / 3.1
- GHANA: 4.3 / 2.5
- COLOMBIA: 3.4 / 2.7
- BRAZIL: 2.5 / 2.6
- SRI LANKA: 3.3 / 2.6
- THAILAND: 3.5 / 2.0
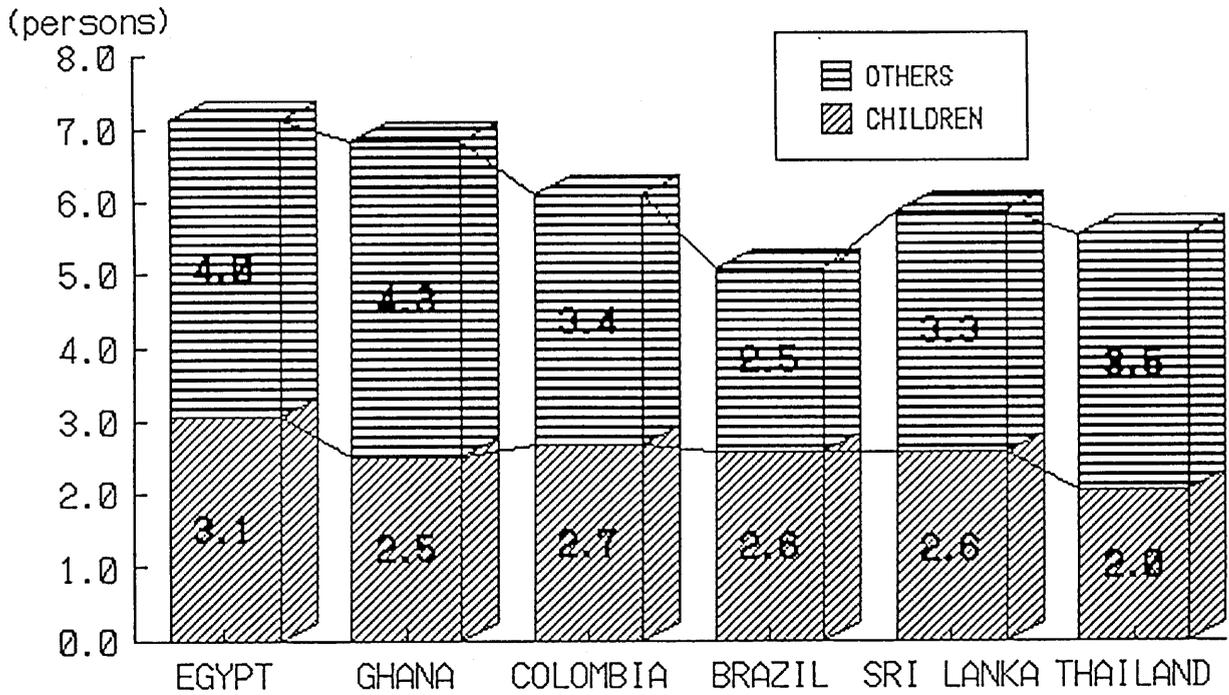
(Based on DHS individual record)

Figure 2 Mean Household Size by Country and Residence

Legend: OTHERS, CHILDREN, URBAN, RURAL

EGYPT GHANA COLOMBIA BRAZIL SRI LANKA THAILAND
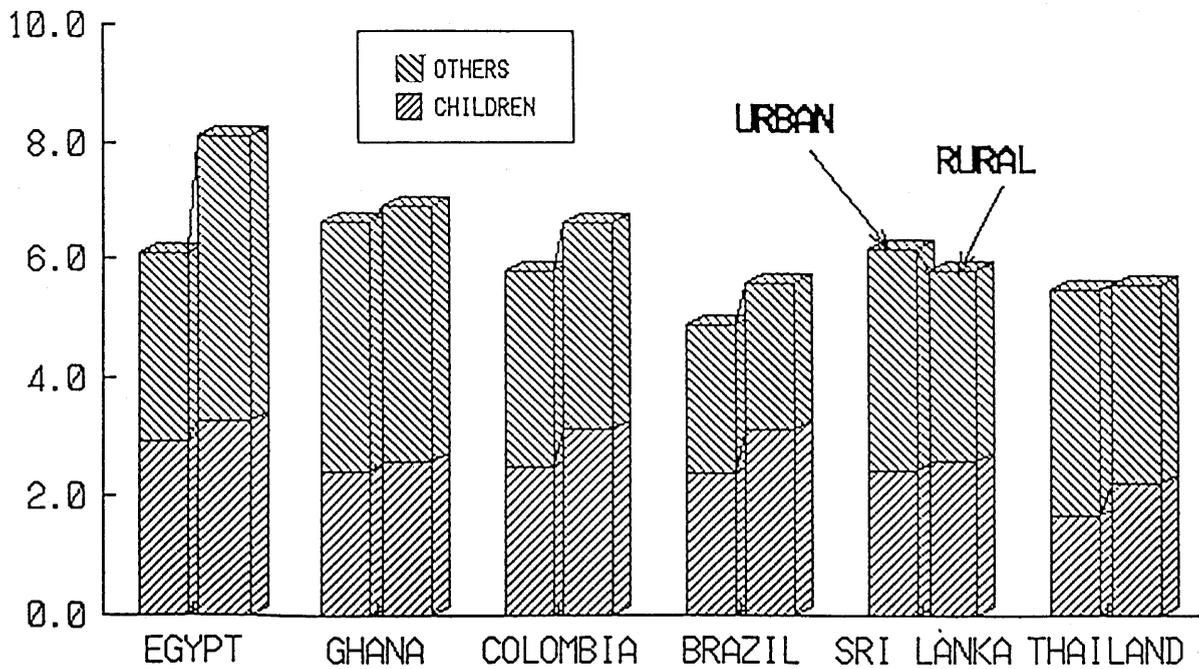
(Based on DHS individual record)

Figure 3   Mean Household Size by the Age of Respondents

EGYPT

GHANA

OTHERS
CHILDREN

COLOMBIA

BRAZIL

SRI LANKA

THAILAND
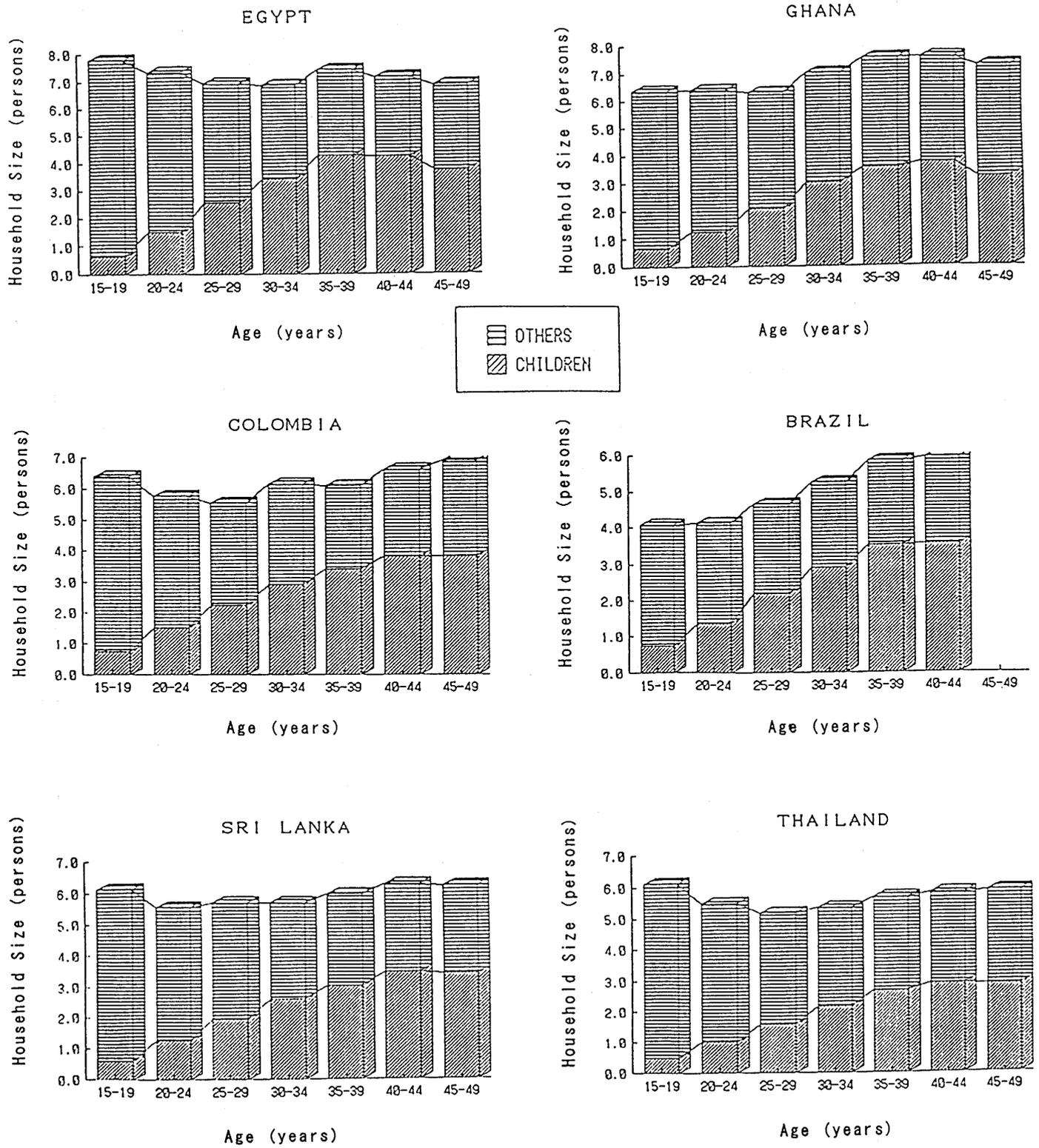
Figure 4   Mean Household Size by Age of
           Married Respondents in JAPAN : 1985
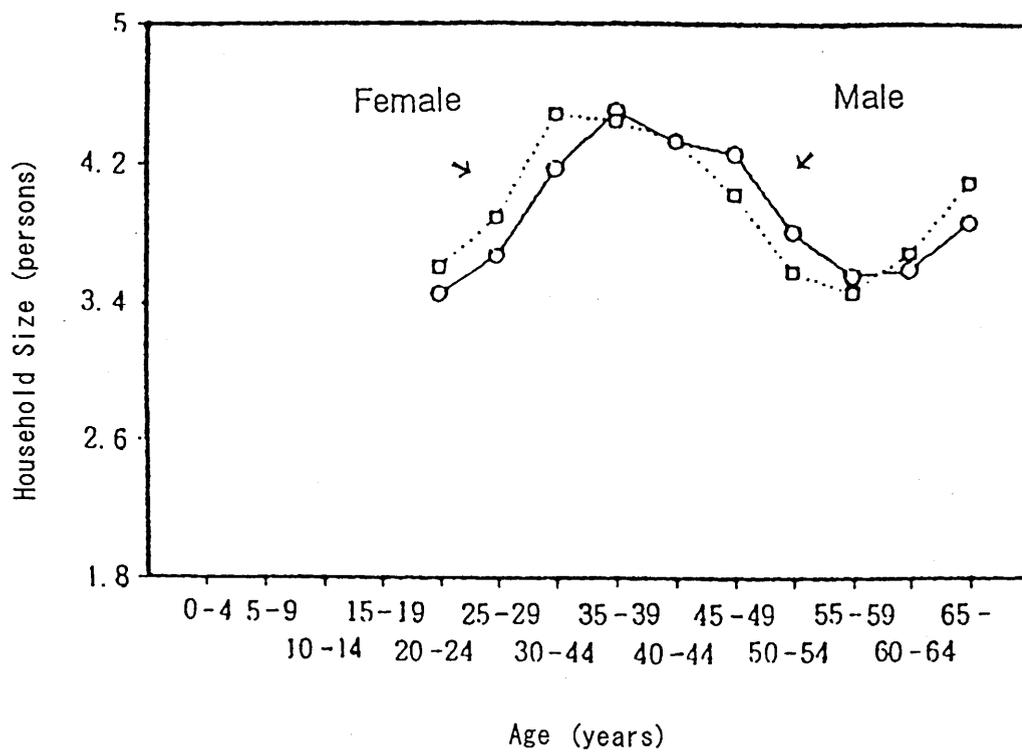
(Source) H. Sakai(1990)

Figure 5 Mean Household Size by the Educational Attainment
of Respondents

EGYPT

GHANA

OTHERS
CHILDREN

COLOMBIA

BRAZIL

SRI LANKA

THAILAND
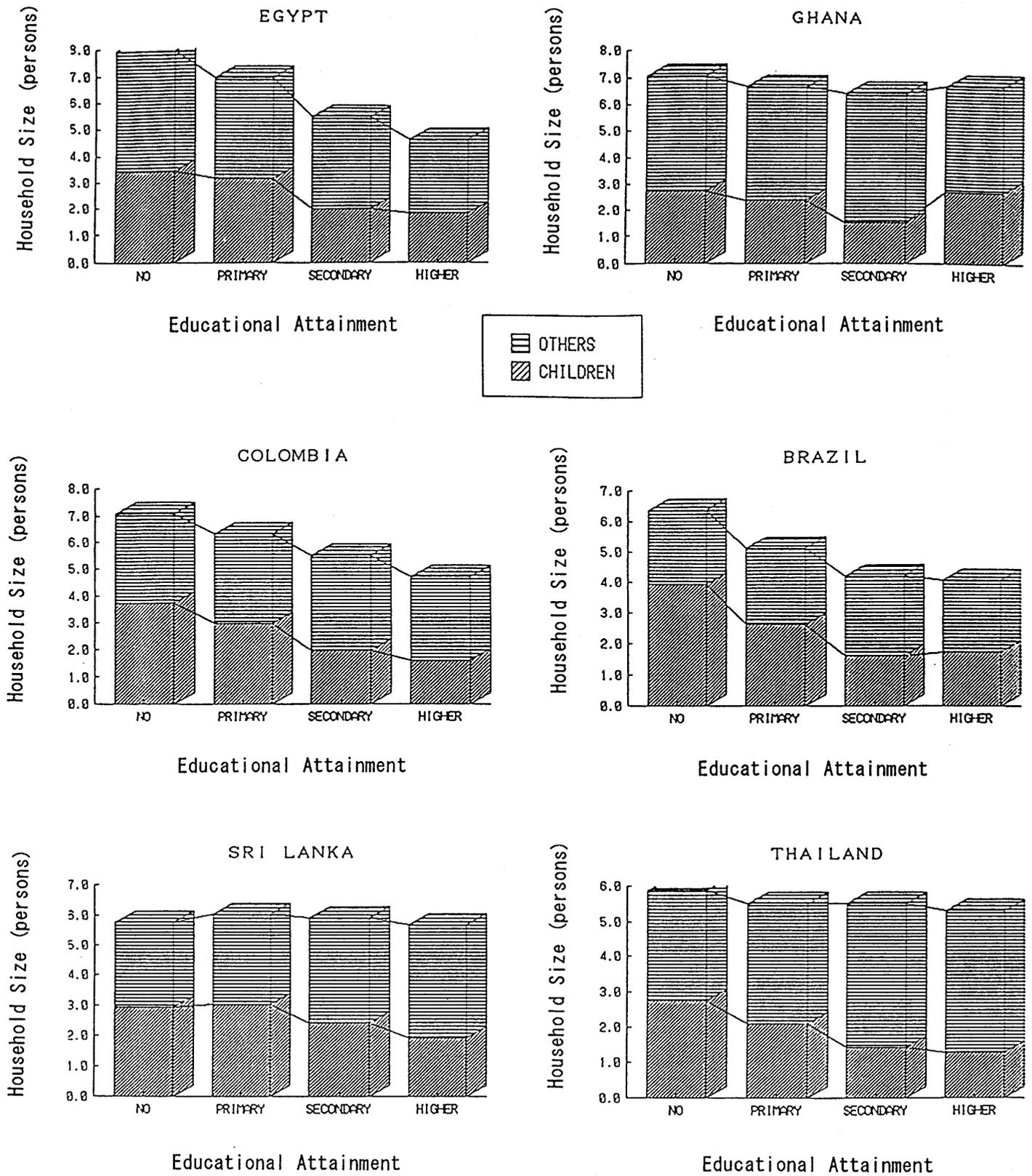
'others' in a household in the other four countries. That is because higher education group themselves and their partners earn more money than the other education attainment group and can afford to keep parents together. In Colombia and Brazil, mean household sizes are not so different by educational attainment and educational attainment has little effect on the mean household size.

WFS (1984) reports that differences of fertility by residence is not as large as those by education. Our results based on DHS also confirms this finding.

5. A MULTIPLE CLASSSIFICATION ANALYSIS OF SIZE OF HOUSEHOLD

We analyzed the effect of the socio-economic variables on mean size of household by MCA analysis.[1]

1) Household Size

Our graphic presentation of MCA results show rough effect of each category of the variable when interaction of these variables suppressed. MCA shows a distance from the grand mean, that is, the magnitude and direction of each category of the variable from it. For example, in case of Egypt, 'HIGHER' is the biggest effect on household size, which brings about 1.8 reduction of household. The next biggest effect is 'RURAL' , which adds 0.7 person to the grand mean.

If someone is 'RURAL' '45-49' and 'HIGHER', his expected household size is calculated by

$$
\begin{array}{rl}
 & 7.11 \quad \text{(mean household size)} \\
+ & 0.7 \quad \text{(rural effect)} \\
- & 1.4 \quad \text{(45–49 effect)} \\
- & 1.8 \quad \text{(higher effect)} \\
\hline
= & 4.6 \quad \text{(expected persons)}
\end{array}
$$

Similar interpretations can be done on all the MCA graphic presentations (Figure 6 – 8).

On urban-rural residence, in all the countries except Sri Lanka mean size of household in rural area is bigger than that in urban area (Figure 6). Egypt and Sri Lanka have a great differential of residence on mean household size.

As to the age of respondents, in Ghana, Brazil, Sri Lanka and Thailand they have a greater effect on mean size of household, the age is proportionate with it. But 15-19 year-old group in Colombia, Sri Lanka and Thailand shows larger household size compared with other age groups. But 15-19 year-old group in Ghana and Brazil is exceptional and displays small size household. That is so supposed because in Brazil formation of nuclear family is pretty prevalent.

Educational differential on mean size of household in Egypt, Colombia and Brazil is big and as educational attainment becomes higher the size of a household

decreases.

Generally speaking, in Thailand and Ghana, age of respondent; in Egypt, residence and educational attainment; in Brazil, age and educational attainment; in Sri Lanka residence, age and educational attainment contribute to big differentials of mean size of household.

2) Children in the Same Household

In every country mean size of household is mainly decided by the age of respondents as is expeceted (Figure 7). Urban-rural differential is rather small. Education has a significant influence on the family size, for example, in general the mean number of children in a household declines as the respondents' educational attainment becomes higher. Especially that holds true of Brazil. Urban-rural differential becomes very small when controlled for the other variables. While in Egypt both single variable analysis and multivariate analysis show little urban-rural difference.

In Egypt, regarding the mean number of children in a household, the modal age group is 35-39 year-old group, while modes of the other four countries are 40-44 year-old group and its value of course declines for 45-49 year-old group. It appears that it is reflected by difference of the mean age at marriage which has strong relation with when for children to leave household. But generally speaking, in developing countries mean age of marriage shows upward trend. So mode of mean number of children by age of respondents will change to 45-49 year-old group.

Age is the most efficient predictor of mean number of children in a household, the next good differentiater is educational attainment and the last is the place of the residence. These findings are almost similar to those confirmed on fertility studies (Ashurst, Balkaran and Casterline 1984; Jones 1982).

3) The "Others" in the Same Household

The composition of "others" in a household when analyzed by urban-rural differential do not reflect any siginificant difference (Figure 8). In Colombia, Brazil, Sri Lanka and Thailand mean number of the "others" in a household in urban area is bigger than that in rural area. Ghana shows little or no difference between urban and rural area. Only in Egypt mean number of the "others" in a household in urban area outnumbers that in rural area.

The age has a dominating effect on mean number of "others" in a household as on mean number of children in a household. But direction of effect is quite opposite, that is, in all the countries the mean number of "others" in a household decreases as the age of respondents increases.

Interestingly, in every country but Egypt, the mean

Figure 6 MCA Figure of Mean Household Size

EGYPT

MEAN=7.11

Deviation from Mean (persons)

GHANA

MEAN=6.83

Deviation from Mean (persons)

COLOMBIA

MEAN=6.08

Deviation from Mean (persons)

BRAZIL

MEAN=5.09

Deviation from Mean (persons)

SRI LANKA

MEAN=5.88

Deviation from Mean (persons)

### THAILAND

MEAN=5.53

Deviation from Mean (persons)
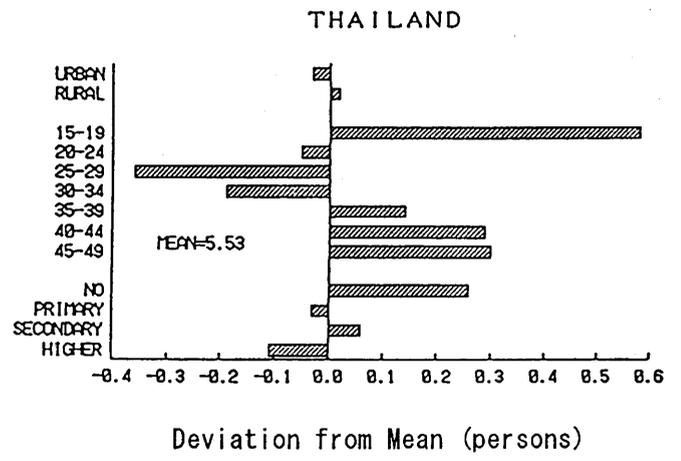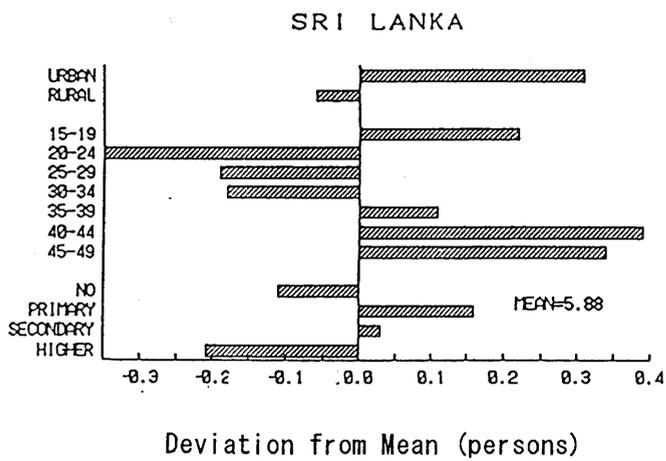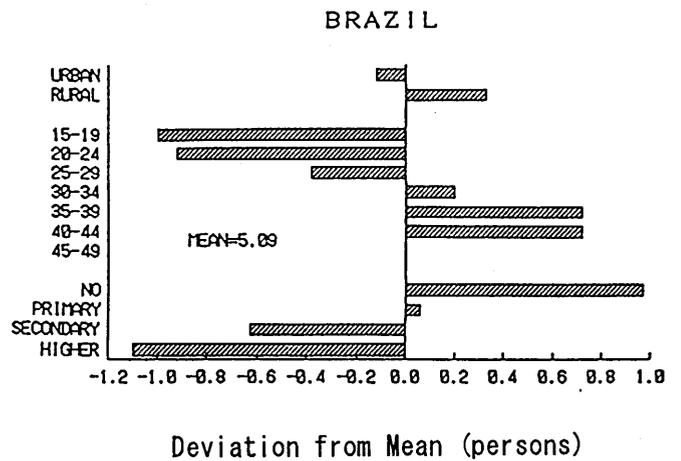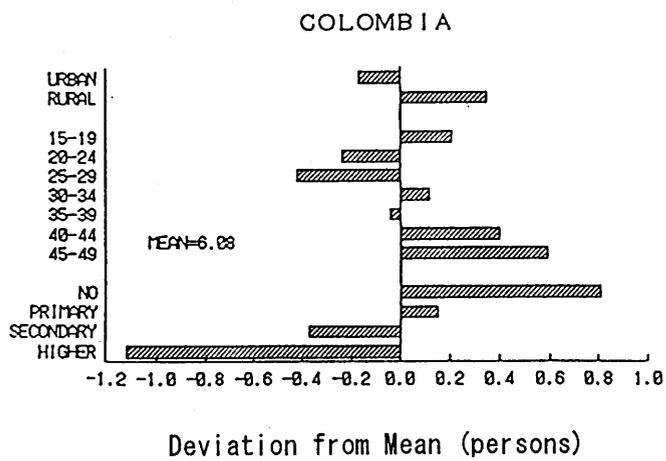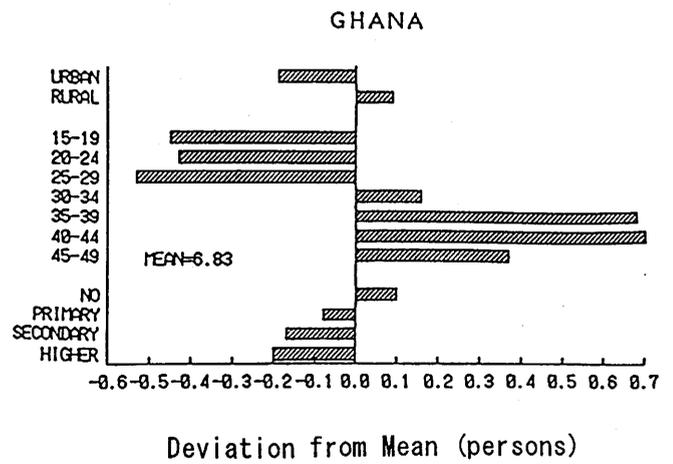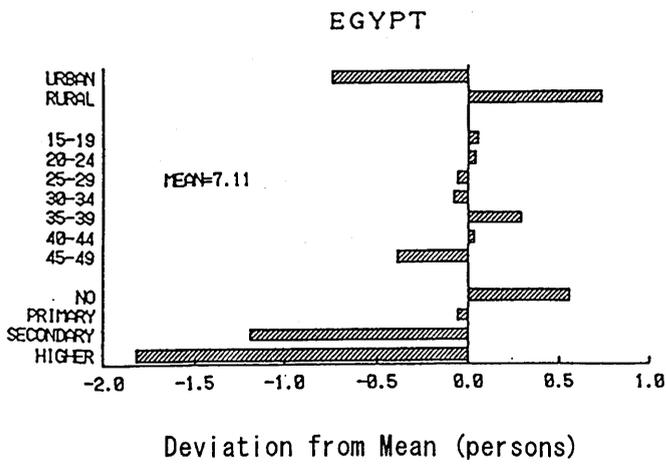
Figure 7   MCA Figure of Mean Number of Children in a Household

EGYPT

Deviation from Mean (persons)

GHANA

Deviation from Mean (persons)

COLOMBIA

Deviation from Mean (persons)

BRAZIL

Deviation from Mean (persons)

SRI LANKA

Deviation from Mean (persons)

THAILAND

Deviation from Mean (persons)
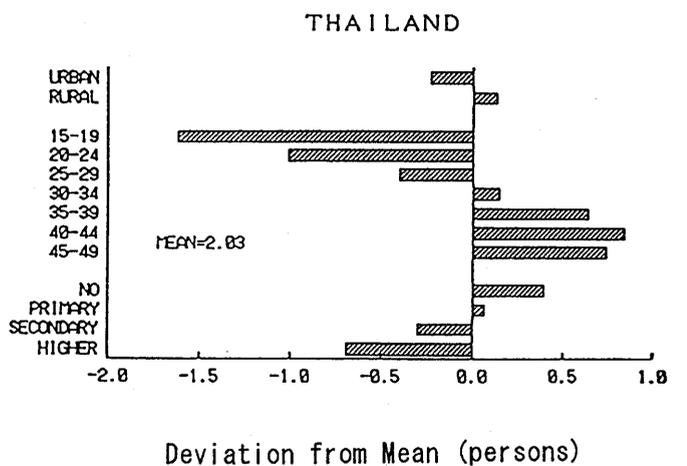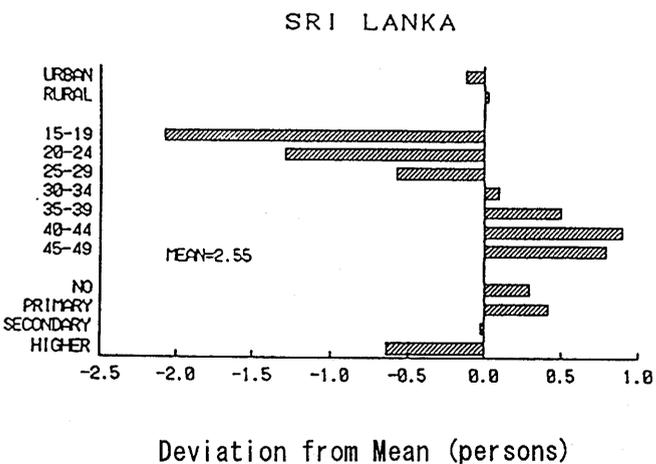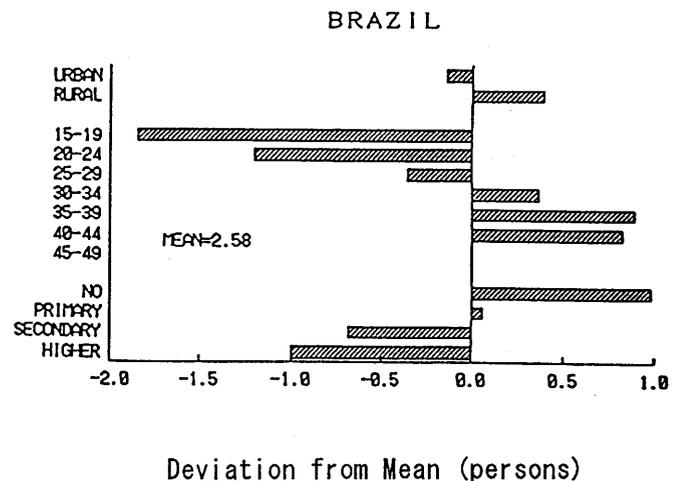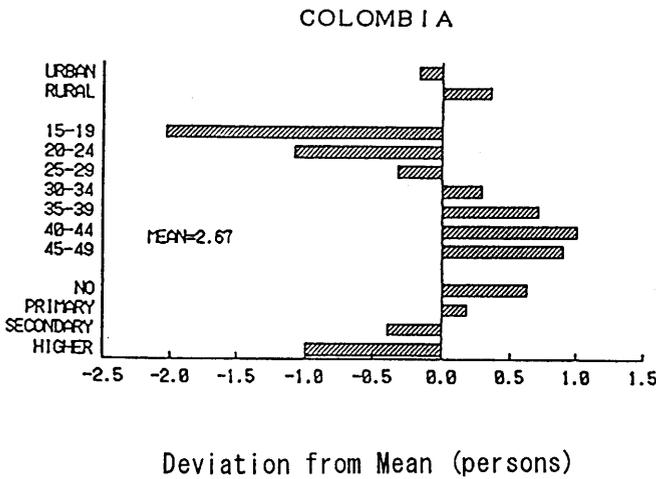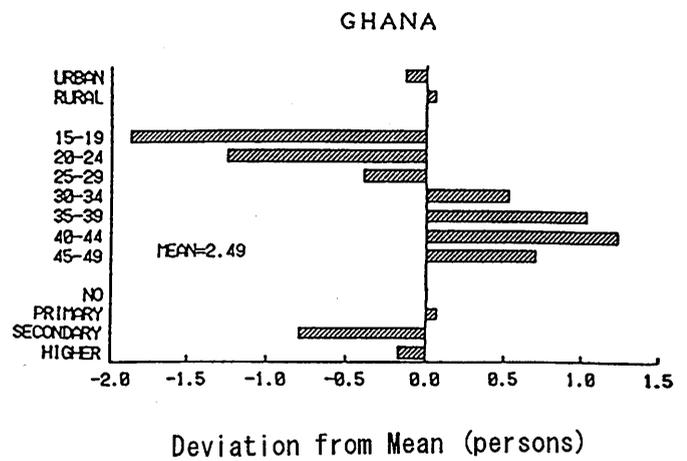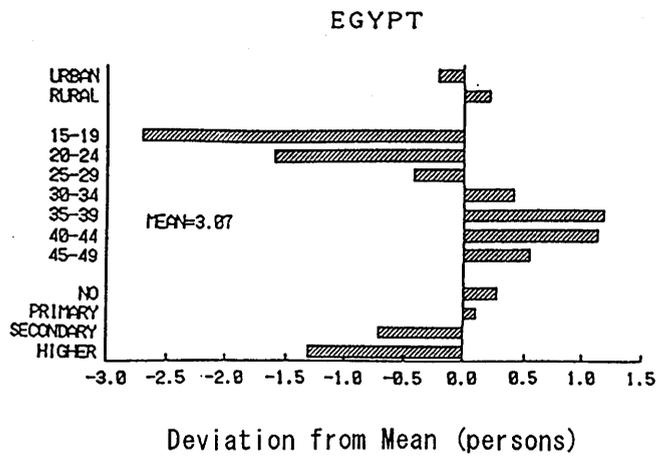
Figure 8 MCA Figure of Number of the Others in a Household

EGYPT

Deviation from Mean (persons)

GHANA

Deviation from Mean (persons)

COLOMBIA

Deviation from Mean (persons)

BRAZIL

Deviation from Mean (persons)

SRI LANKA

Deviation from Mean (persons)

THAILAND

Deviation from Mean (persons)
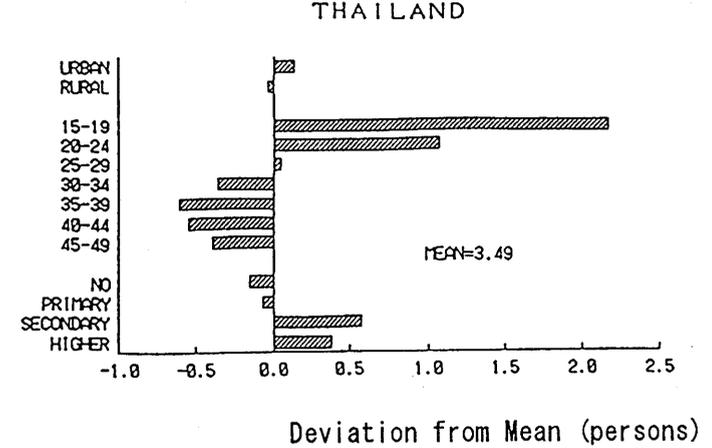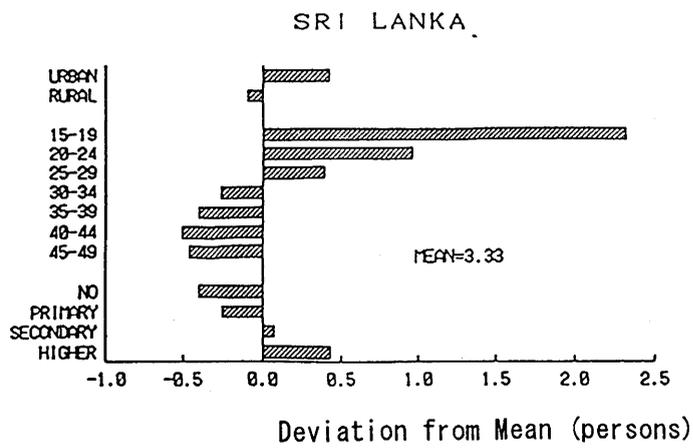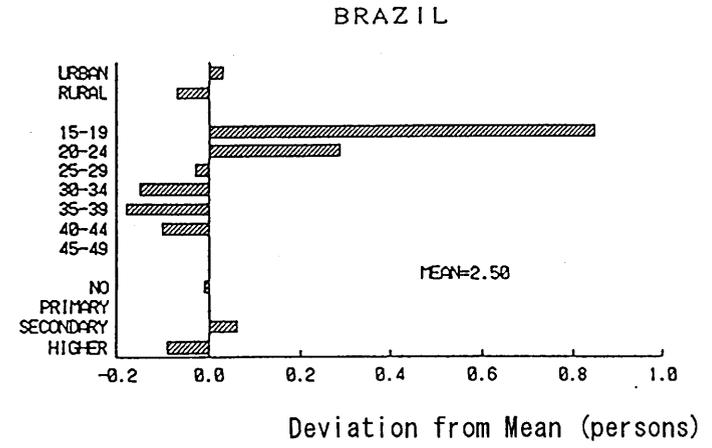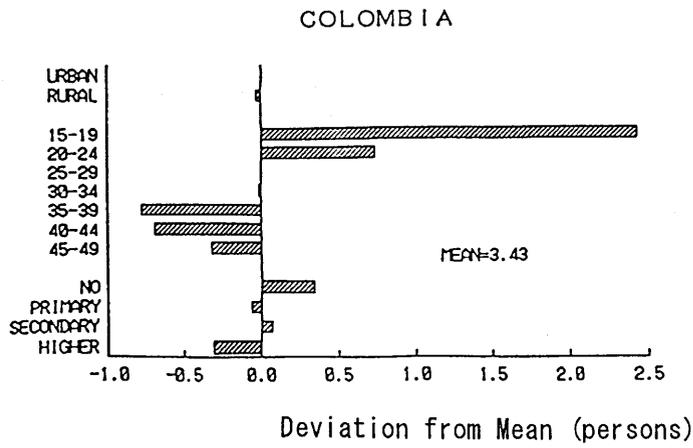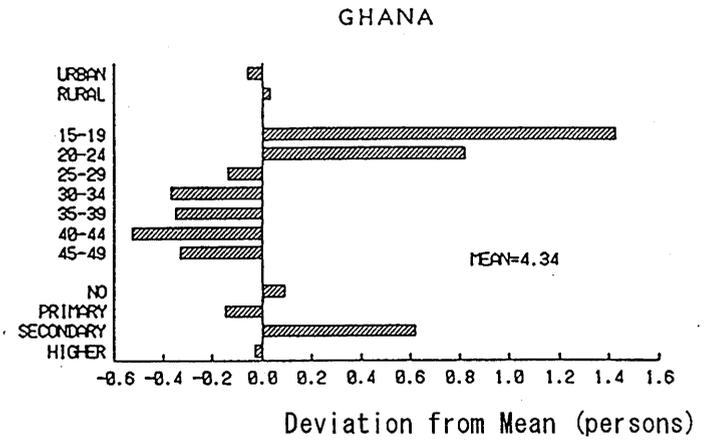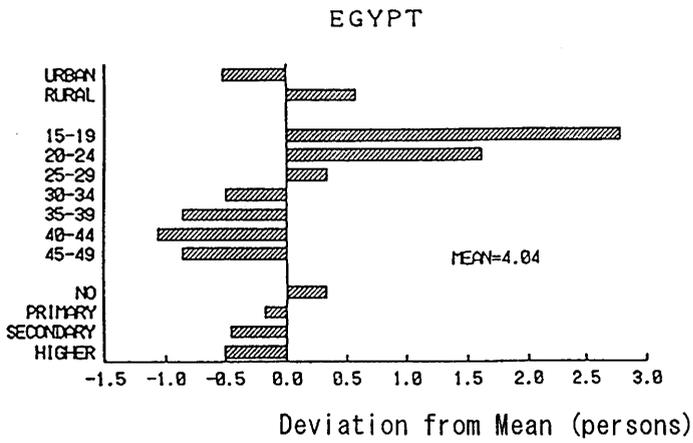
size of household declines as the educational attainment of the respondent increases. That is perhaps because the education has stronger effect on one's life style and norm of family formation.

6. DISCUSSION AND CONCLUSION

Our result suggests that household formation concerns not only with fertility level but also with cultural family formation. This is well expressed by the fact that the age of respondents effects quite contrary between the mean number of children and mean number of the "others" in a household.

So we can't be too careful to determine the influence of socio-economic variables on size of household. We must explore and accumulate the fundamental facts about household and family.

First, we must look into distribution of size of household. Ekouevi, Mohamed, Bernard and Cantor (1991) observed that a puzzling finding however, is that of small households, those with one or two members in sub-Saharan African Countries. This observation surprises us very much because this finding is in contrast to what is usually expected. This finding is very didactic for household and family studies. We must consider the distribution of the size of household itself.

Rodriguez and Aravena (1991) observed that one would expect differentials to widen early in the transition and to narrow afterwards. If this is true, we must be careful of socio-economic differential on household size. In order to confirm this hypothesis, we had better deal with the variance of household size by socio-economic variables.

Now we try to consider variance on size of household. Table 1 shows coefficient of variance of mean household size by country, residence, age and education of respondents. Egypt and Ghana have more diversity than the other four countries. As for residential variance, with the exception of Egypt, which shows more rural diversity, variance in urban area is greater than in rural area. In Ghana and Thailand the difference is more pronounced compared to the other countries. As for age, younger cohorts show greater variance than older cohorts, but interestingly, variance of the oldest cohorts is greater than that of the second oldest cohorts. That is reflected by the difference of age at marriage of generation of respondents' children.

As for education, secondary education group shows greater variance than primary one in all the countries except Brazil. Especially this finding means that the well-educated experience fertility transition more rapidly than any other group.

We must find the relationship of these results with diffusion process. In accordance with Rodriguez et. al.

(1991), our working hypothesis is that social strata differentials widens early in the transition and it narrows afterwards. In other words one country which is under the demographic transition show bigger variance first and smaller variance afterwards than those which are not experiencing such transition. We would like to ascertain it by the future study.

Figure 9 represents percentage of respondents who live with their parent(s), these data are not available for Egypt and Brazil. In Sri Lanka and Thailand in younger cohorts higher percentage of respondents live with their parents. On the other hand, In Colombia, very low percentage of the respondents reported to live with their parents. The difference between Sri Lanka and Colombia is about thirty percentage. Such difference of custom makes a big difference to mean size of household.

Of cource, the percentage difference of respondents' living with their parents is influenced by the difference of mortality of parents by country. In thinking of household formation, we must take into consideration mortality of respondents' parents as well as fertility and mortality of respondents.

Page (1989) observes that in sub-Saharan Africa, it is not uncommon for children away from their mothers, particularly after the age of five. Lloyd and Desai (1991) shows in sub-Saharan Africa higher proportion of respondents' children living away from mothers than other counrty and region.

It is very natural to think that the percentage of mothers living with their children differs very much according to the sex and age of children. We must take into account of the sex and age of children in studying the size of household.

Now we take one example, the sex ratio of children at home. A daughter is generally thought to be apt to leave earlier than son because of the difference of age at marriage by sex and difference of custom of succession to household by sex.

Table 2 shows that sex ratios of children in a household varies across the countries. But every country shows the sex ratio over 105. Among all, Egypt has a peculiar characteristics. First the sex ratio at home is very high and differential by age of respondents is large. The age groups 40-44 and 45-49 show extreme high ratio. As for education, no education and higher education groups show a high sex ratio. This result occurs because of sex preference of children for parents in Egypt.

In Sri Lanka, the sex ratio in urban area is higher than that in rural area which is an exception compared to the other countries. Like Egypt no education and higher education group show a high sex ratio. Thus the relationship between couples and children is different by

Table 1 Coefficient of Variance by Mean Household Size by Country, Residence, Age and Education of Respondents

Variable	Category	Country					
		Egypt	Ghana	Colombia	Brazil	Sri Lanka	Thailand
Residence	Total	53	53	46	43	39	45
	Urban	50	58	46	43	41	52
	Rural	51	51	44	42	38	40
Age	15-19	55	56	60	58	48	50
	20-24	61	58	58	52	48	54
	25-29	59	55	43	40	43	48
	30-34	51	51	41	37	37	42
	35-39	47	49	38	38	34	38
	40-44	44	47	38	41	34	38
	45-49	50	50	43		35	41
Education	No	52	53	44	40	39	46
	Primary	49	53	45	43	37	44
	Secondary	51	58	46	40	39	51
	Higher	46	39	37	33	41	40

(Source) Based on DHS individual record.

## Table 2 Sex Ratio of Children at Home by Country, Residence and Age and Education of Respondents

Variable	Category	Country					
		Egypt	Ghana	Colombia	Brazil	Sri Lanka	Thailand
	Total	118	108	112	105	108	105
Residence	Urban	117	99	109	104	113	102
	Rural	120	112	116	107	107	107
Age	15-19	111	98	79	135	126	112
	20-24	100	103	95	99	109	99
	25-29	110	100	123	101	104	100
	30-34	107	113	107	104	102	102
	35-39	116	110	112	101	109	110
	40-44	127	123	112	115	109	108
	45-49	164	102	122		121	108
Education	No	122	110	113	111	121	111
	Primary	118	108	110	103	107	104
	Secondary	101	90	114	112	103	111
	Higher	113	90	143	101	110	105

(Note) Sex Ratio = Boys / Girls × 100
(Source) Based on DHS individual record.

Figure 9 Percentage Distribution of Respondents Living with Parents

(Based on DHS individual record)
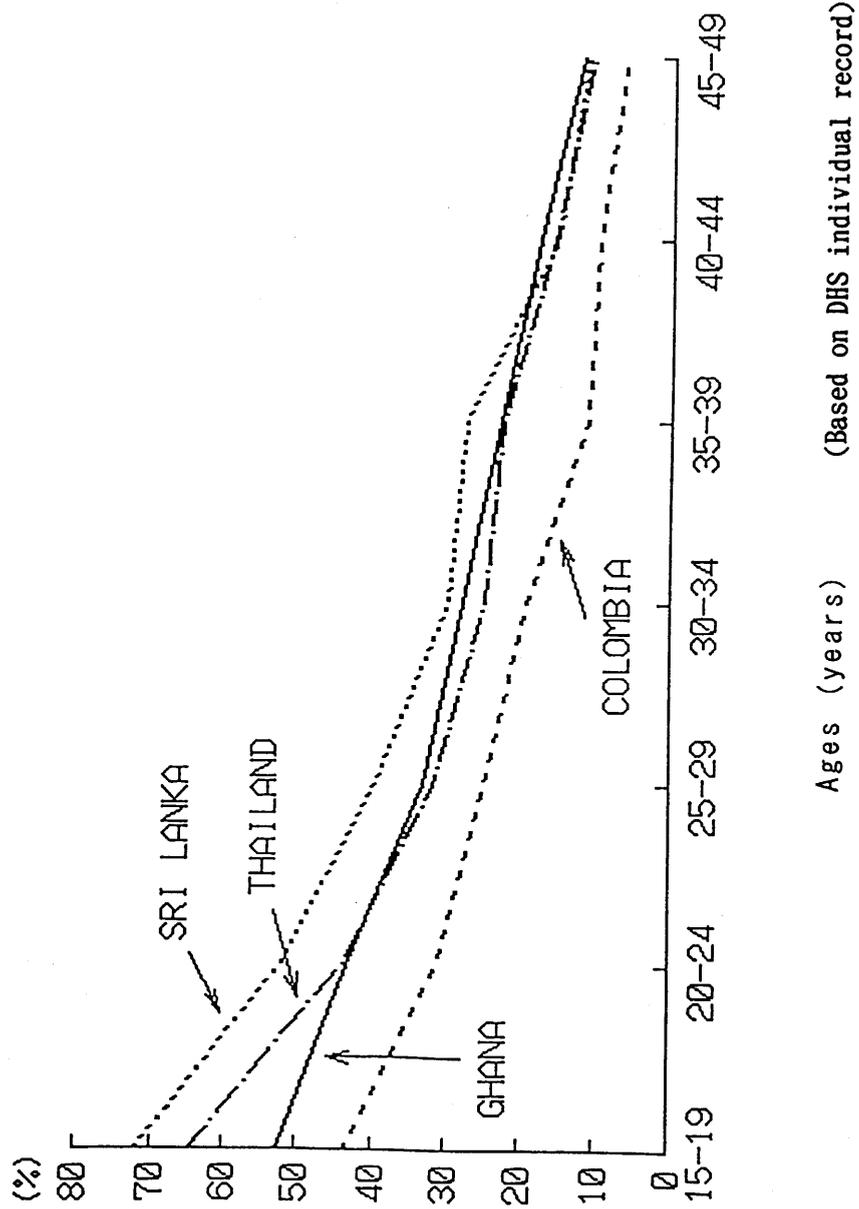
the sex of child.

Simmons (1985) said, "We have recognized a range of empirical regularities characterising fertility behavior in different settings. We still have a variety of abstract 'stories' to tell about these relationships. Often, different stories can be used to explain the same observations, and no one has yet managed to formulate a story that incorporates enough of the facts to convince all".

This observation particularly holds valid in the household and family studies in developing countries. So our findings about a household size are just the starting points to formulate a story which needs further verification and validation.

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NOTE
1. On MCA analysis, refer to SPSSX USER'S GUIDE 2ND ED (1986) pp.459-462.