

THE ROLE OF EDUCATIONAL ATTAINMENT IN FAMILY FORMATION AMONG KOREAN WOMEN*

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This paper examines the relationships among social backgrounds, educational attainment, and family formation within a sample of 988 women who were currently married, married only once, had borne at least one child, had no premarital conception, and were aged 30 to 44 in 1971.

Findings indicate that social backgrounds have effects on educational attainment and a large portion of their impact on family formation were intermediated by educational attainment. Educational attainment plays an important role in family formation patterns both directly and as a prime mediating variable between social backgrounds and family formation.

I. INTRODUCTION

Recently many students with an interest in the population problem have engaged in renewed efforts to expand the scope of research in this area. One of the major issues in this respect has been the improvement of the limited effectiveness of family planning programs. Since the late 1960s more extensive investigation have expanded previous research on the context of family structure, welfare, health and other factors. In this context, one avenue of investigation has been the implication of changing roles of women for fertility levels (Germain, 1975). Specifically, the argument has been advanced that if women are exposed to non-traditional roles, the relative importance of the mother's role will be diminished. One of the most influential factors in the development of non-familial roles is education. More concretely, education is thought to impart values, aspirations and skills encouraging participation in non-familial roles. However, educational attainment, itself, is linked to other facts associated with the social background of women, and especially in the formative years of childhood socialization and family life, which have a direct bearing on later life.

Despite an abundance of studies on the relation between education and fertility, however, the causal relation has yet to be defined and submitted to systematic empirical testing (Holsinger and Kasarda, 1976). The purpose of this study is to clarify the relationship between educational attainment and fertility. In addition to an analysis of the relationship between educational attainment and fertility, this study aimed to evaluate the effects of social background factors (i.e., residential background and religious background) on educational attainment and family formation variables (i.e., age at first marriage, timing of first birth, infant and child mortality and marital fertility), and to

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examine the direct and indirect effect of age at first marriage, timing of first birth, and infant and child mortality on marital fertility.

II. PROCESS MODEL OF FAMILY FORMATION

Figure 1 presents a conceptual outline of the general causal model to be evaluated in this research. Before presentation of the assumed interrelationships, a preliminary discussion on the rationale for selection of the family formation variables is presented.

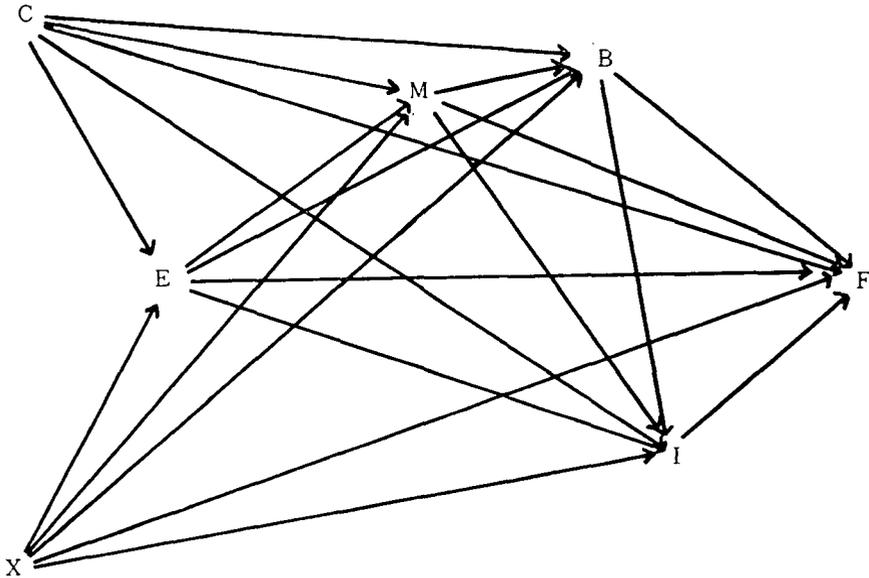


Figure 1. A process model of fertility behavior for married women within a family life-cycle framework.

Note

- C=Childhood residential background
- X=Religious background
- E=Educational attainment
- M=Age at first marriage
- B=Timing of first birth
- I=Infant and childhood mortality
- F=Marital fertility

Since life cycle categories have great potentiality as analytical tools, many sociologists (Sorokin, Zimmerman and Galpin, 1931; Duval, 1957) have developed the family life cycle into four categories: (1) Married couple just starting independent existence, (2) couple with one or more children, (3) couple with one or more adult self-supporting children, and (4) couple becoming old: some children marry, separate from the family, and start as an independent couple. Duval (1957) presented a more elaborate eight stage family life cycle defined as follows: (1) Beginning families: married couple without children, (2) childbearing families (oldest child's age from 0 to 30 months), (3) families with pre-school children (oldest child's age from 2.5 to 6 years), (4) families with school children, (5) families with teenagers, (6) families as launching centers (first child gone to marriage), (7) families in the mid-years (empty nest to retirement), and (8) aging families (retirement to death of one or both spouse). Both of the above formulations consider marriage and first child's birth as important elements in the family life cycle process. Therefore,

it is beneficial to research these two variables as main family formation variables.

Processes of family formation impact on the size and composition of family units. In this sense, family formation outcomes can be viewed, in part, as the result of a series of increments and decrements to family membership. If marriage and first child birth are recognized as incremental factors in family formation, the death of infants and children can be viewed as decremental factors. Thus, this variable is included in the family formation processes contained in the model.

As the figure illustrates, an individual's childhood residential background and religious background are taken to be predetermined variables. In other words, their antecedents are taken as givens and are not the concern of this study. The model proceeds through educational attainment and four family formation variables including age at first marriage, timing of first birth, infant and child mortality and marital fertility.

It long has been recognized that an individual's educational attainment is dramatically influenced by various factors in the individual's social background. In this research, two features of the above social background are considered, namely, residential background and religious background. It can be hypothesized that the more urbanized the milieu during one's formative years, the greater the opportunity for higher levels of formal education (Burchinal, 1961; Haller and Sewell, 1967). Also, it can be hypothesized that the more non-traditional a religion is, the more female educational attainment is encouraged and, hence, actual higher levels of educational attainment (Bordua, 1960; Warren, 1970). Consequently, these two variables are assumed to have a positive direct impact on educational attainment. Similarly, these social origin factors are expected to influence, positively, age at first marriage (Smith and Karim, 1978; Burchinal and Chancellor, 1963; Rosenweike, 1972; Smith, 1978) while negatively influencing the timing of first birth, infant and child mortality (Kunstader, 1978) and overall marital fertility (Stoechel, 1975; Freedman and Whelpton, 1950; Smith, 1977).

In recognition of the important role of education curbing high fertility, this research also examines the impact of educational attainment on family formation variables. Since marital fertility is cumulated results of the family formation process, it is important to consider the differential impact of educational attainment on the family formation variables. Conceptually and empirically, it is contended that women with relatively higher levels of education marry later (Palmore and marzuki 1969; Rosenwaike, 1972; Smith, 1977) have longer interval between marriage and first birth (Bartz and Nye, 1970), lower levels of infant and child mortality (Laebner and Driver, 1973) and lower overall marital fertility (Schultz, 1969; Dradatas, 1969, Cain and Weininger, 1973, Janowitz, 1976; Holsinger and Kasarda, 1976) than women with relatively lower levels of educational attainment.

Age at first marriage is hypothesized to be positively associated with infant and child mortality (McKewn, 1976) and negatively associated with timing of first birth (Palmore and Maruki, 1969; Chung et al., 1972; Ewer and Criminal-Gardner, 1978) and overall marital fertility (Kim et al., 1974; Cho and Retherford, 1974). Timing of first birth is hypothesized to be negatively related to both infant and child mortality and positively related to overall marital fertility. Finally, infant child mortality is hypothesized to have a positive effect on overall marital fertility (Rutstein, 1974; Ben-Parath, 1976).

In summary, the process model illustrated in Figure 1 depicts relationships among residential background, religious background, educational attainment, age at first marriage, timing of first birth, infant and childhood mortality, and marital fertility. Residential background and religious background are assumed to be exogenous while the other variables are endogenous and interrelated with direct and indirect effects.

Although not specifically illustrated in the diagram, all indirect effects are examined

including: (1) the indirect effects of social background variables on each of the family formation variables; (2) indirect effects of educational attainment on each family formation variable (exclusive of age at first marriage); and (3) various indirect effects among the family formation variable (exclusive of age at first marriage); and (3) various indirect effects among the family formation variables.

III. DATA AND METHODS

Data Source

The source of data in this study is the 1971 survey on Korean Attitudes and Birth Control Behavior conducted by the Korean Institute for Research in the Behavior Sciences. The three-stage cluster sampling technique was applied and 1,883 eligible respondents were interviewed. The respondents in this study were a nationally representative sample of women between 15 and 44 years of age who were married at the time of the survey. A detailed description of the sample, the procedure of data collection, research instrument, and other information regarding the study design have been published by the Korean Institute for Research in the Behavioral Science, in a volume entitled *Psychological Perspective: Family planning in Korea* (1972).

Sample

From the above original data set the sample for this research includes all first married women, currently married, with one or more live births, between the age of 30 and 44 at time of the survey. The limitation to this age group in the analysis was based on eliminating probable interactions of the proposed model with marriage. It is expected that there differences between the characteristics of ever married women and the characteristics of never married women. According to Smith (1978), 96 percent of Korean women are married by age 30. Thus, it may be assumed that the bulk of Korean women are married by age 30. The limitation of the simple to currently married women is consistent with the population for which the proposed model was designed. It is estimated that spouse-presence is a major factor in the study of marital fertility. Childless women are excluded, since the study on childless women is out of this model and the percentage of childless women among currently married women is six percent. To eliminate the impact of the interval between divorce and remarriage, only women in first marriage are considered (96 percent of the total sample). Finally to eliminate the impact of premarital conception on timing of first child birth, those women who had their first baby less than six month after their marriage are excluded (7 percent).

With the sample selection completed according to the above described procedures, the total sample size is 988 women.

Measurement

The variables in the analysis are as follows:

Residential Background: This variable has an important meaning in the study of the individual development process, since earlier life experiences have been an influence on later behavior. Therefore, significant differences among respondents will expected in the development process depending on the urbanity of childhood residence. Childhood residential background is treated as a continuous variable and scaled as follows:

large cities (population size more than one million, such as Seoul, Pusan, Taegu)=2
 small cities (population size between 50,000 and 999,999, such as Inchon, Kwangju
 and 26 other cities in South Korea and 9 cities in North Korea)=1
 rural villages (population size under 50,000)=0

Religious Background: According to Smith (1978), there is no significant difference in family formation between Catholics and Protestants and also between Confucians and Buddhists. And the age at first marriage of Catholics and Protestants is later than of Confucians and Buddhists in Korea. Therefore, the category of religious background is dichotomized as follows: Christian (1) and non-Christian (0). It is assumed that no major change in religious status occurred between the formative years and the time of the survey. The above residential background and religious background are the exogenous variable in this model.

Educational Attainment: The respondents' answers are divided into nine categories: no schooling (0 year), elementary school dropout (3 years), elementary school graduate (6 years), junior high school dropout (7.5 years), junior high school graduate (9 years), senior high school graduate (12 years), college dropout (14 years), and college graduate and more (16 years).

To form a continuous scale, the mean number of years between the lowest and the highest levels included in the respective categories is utilized. The respondents who reported receiving education from the tradition style Korean school were assigned to the "no schooling" category because only formal education is considered in this study.

Age at First Marriage: In Korea, especially in rural areas, many women only know their age in lunar instead of solar calendar age has been converted to the western (solar) calendar age. This variable is recorded in number of years.

Timing of First Birth: This variable is recorded in number of years between age at first marriage and year of first child's birth.

Infant and Child Mortality: Infant and child mortality is operationalized in this study with the following formula: number of infants' and children's deaths per number of children ever born.

Marital Fertility: Marital Fertility is defined as the rate resulting from dividing the number of children ever born minus one (first child's birth) by the number of years between the first birth and the survey. The educational attainment and the formation variables such as age at first marriage, timing of first birth, infant and child mortality and marital fertility are endogenous variables in the model.

Method of Data Analysis

For the analysis of the proposed model the technique of path analysis is used. The technique of path analysis is well developed on the social science literature (e.g., Bollen, 1964; Duncan, 1966; Land, 1969; Goldberger and Duncan, 1973). The proposed model can be represented with the following set of recursive structural equations.

$$E = P_{EC}C + P_{EX}X + P_{EU}U_1 \quad (1)$$

$$M = P_{MC}C + P_{MX}X + P_{ME}E + P_{MU}U_2 \quad (2)$$

$$B = P_{BC}C + P_{BX}X + P_{BE}E + P_{BM}M + P_{BU}U_3 \quad (3)$$

$$I = P_{IC}C + P_{IX}X + P_{IE}E + P_{IM}M + P_{IB}B + P_{IU}U_4 \quad (4)$$

$$F = P_{FC}C + P_{FX}X + P_{FE}E + P_{FM}M + P_{FB}B + P_{FI}I + P_{FU}U_5 \quad (5)$$

where all variables are in standard form.

C=Childhood residential background,

E=Educational attainment,

B=Timing of first birth,

X=Religious background,

M=Age at first marriage,

I=Infant and child mortality,

F =Marital fertility

$U_1, U_2, U_3, U_4,$ and U_5 =Residual variables

Before calculating standardized coefficients, the causation assumptions and significance should be examined. The causation assumptions are linearity, additivity and unidirectionality. Unidirectionality has been already demonstrated theoretically in the literature review section. Therefore, only linearity and additivity are statistically tested.

Linearity is examined by the non-linear proportion of variance explained which is obtained by subtracting linear variance explained by the independent variable (r^2), from the total variance (e^2).

Additivity is calculated by the F statistic which is the ratio of the amount explained by interaction divided by the amount unexplained by the effects of independent variables and interaction (For detailed information on linearity and additivity, see Blalock, 1972, pp. 411-415 and 483-489, respectively).

The significance test for the coefficients for the entire sample is based on the F statistics. In this instance the F statistic is the ratio of the explained sums of squares divided by the unexplained sums of squares.

IV. RESULTS

All relationships show linearity and there are no significant interactions. The results of the analyses are presented in Tables 1,2, and 3.

Table 1. Zero-order Correlation Matrix, Means Standard Deviations of Variables in the Model

	CRB	RB	EA	AAM	TOB	ICM	MF
CRB	1.000						
RB	0.078	1.000					
EA	0.064	0.235	1.000				
AAM	0.314	0.211	0.528	1.000			
TOB	-0.083	-0.066	-0.209	-0.366	1.000		
ICM	-0.069	-0.095	-0.187	-0.253	0.064	1.000	
MF	-0.173	-0.060	-0.224	-0.129	-0.044	0.243	1.000
Mean	1.375	.156	4.433	19.579	2.654	0.084	0.254
S.D.	.708	0.363	4.069	3.135	2.337	0.143	0.098

N: 988

Note: CRB: Childhood Residential Background

RB: Religious Background

EA: Educational Attainment

AAM: Age at Marriage

TOB: Timing of First Birth

ICM: Infant and Child Mortality

MF: Marital Fertility

Table 2. Significance of the Direct Effects of Independent Variables on Dependent Variables in the Model

Dependent Variable(s)	Independent Variable(s)	F	Significance Level
EA	CRB	238.426	0.001
	RB	52.273	0.001
	Multiple R (0.48924)		
AAM	CRB	11.510	0.01

Dependent Variable(s)	Independent Variable(s)	F	Significance Level.
TOB	RB	11.791	0.01
	EA	224.710	0.001
	Multiple R (0.54284)		
	CRB	2.113	NS
	RB	0.294	NS
	EA	1.289	NS
	AAM	105.587	0.001
ICM	Multiple R (0.370)		
	CRB	1.290	NS
	RB	1.086	NS
	EA	4.673	0.05
	AAM	34.705	0.001
	TOB	1.192	NS
MF	Multiple R (0.267)		
	CRB	7.773	0.01
	RB	0.001	NS
	EA	18.340	0.001
	AAM	0.020	NS
	TOB	9.123	0.01
	ICM	46.609	0.001
	Multiple R (0.330)		

Note: NS-Not significant at the 0.05 level.

Table 1 presents the zero-order correlations, means and standard deviations for all variables in the model. The correlations are not discussed here but are presented to provide the background data from which the model is estimated. Table 2 contains data on all direct effects (unstandardized and standardized regression coefficients) corresponding F-ratios, significance levels and coefficients of multiple determination. Each correlation coefficient shown in Table 1 is decomposed into direct effects (standardized partial regression coefficient along each causal transverse tracing forward only and an unspecified (spurious) joint association due to the independent variable's association with other antecedent variables that influence dependent variables. Table 3 shows the results of the decomposition of the correlation coefficients for all variables in the model.

For each endogenous variable a series of analyses is performed. First, the direct effects of each independent variable on the dependent variable of relevance are examined to test the main hypotheses of the study. Second, comparison of the relative levels of each of the independent variables is accomplished. Third, the degree of joint association is evaluated. Fourth, the indirect effects are assessed. Finally, the total explanatory power of the independent variables is examined.

The above analyses are performed in turn for each endogenous variable in the model. The next subsections, therefore, are organized about the successive endogenous variables.

Educational Attainment

It was hypothesized that childhood residential background and religious background would have a positive influence on educational attainment. Specifically, the greater the urbanity of the women's childhood residence and affiliation with the Christian religion, the higher the level of educational attainment. Both of the above hypotheses are supported. Each of the above variables exhibits a significant positive effect on educational attainment. The coefficients for childhood residential background and religious background

Table 3. Decomposition of Effects between Independent and Dependent Variables in the Model

Dependent Variable(s)	Independent Variable(s)	Total Effect	Direct Effect	Indirect Effect					Joint Association
				Total	Via EA	Via AAM	Via TOB	Via ICM	
EA	CRB	.430	.430						.016
	RB	.202	.202						.033
	U ₁	.880							
AAM	CRB	.300	.102	.198					.014
	RB	.187	.095	.092					.023
	EA	.460	.460						.067
	U ₂	.815							
TOB	CRB	-.079	.048	-.127	-.067	-.060			-.004
	RB	-.060	.017	-.077	-.043	-.034			-.006
	EA	-.210	-.043	-.167		-.167			.001
	AAM	-.363	-.363						-.003
ICM	U ₃	.902							
	CRB	-.062	.039	-.101	-.078	-.022	-.002		-.007
	RB	-.091	-.033	-.058	-.037	-.020	-.001		-.004
	EA	-.181	-.085	-.096		-.098	.002		-.006
	AAM	-.214	-.227	.013			.013		-.039
MF	TOB	-.036	-.036						.099
	U ₄	.953							
	CRB	-.169	-.095	-.074	-.078	-.000	-.005	.008	-.004
	RB	-.047	-.001	-.046	-.036	-.000	-.002	-.007	-.012
	EA	-.180	-.165	-.015		-.002	.005	-.018	-.043
	AAM	-.005	.005	-.010			.038	-.048	-.124
TOB	-.106	-.098	-.008				-.008	.062	
ICM	ICM	.214	.214						.029
	U ₅	.938							

Note: CRB: Childhood Residential Background RB: Religious Background
 EA: Educational Attainment AAM: Age at Marriage
 TOB: Timing of First Birth ICM: Infant and Child Mortality
 MF: Marital Fertility U₁, U₂, U₃, U₄, U₅: Residual Variables

are statistically significant at the 0.001 level of probability.

Of the two variables, the direct effect of childhood residential background (.430) is a little more than double that found for religious background (.202). Only a small portion of the total association between each of the two variables and educational attainment is due to joint association. The two variables combined explain about 22.6 percent of the variation in educational attainment.

In summary, both childhood residential background and religious background exert a positive direct influence on educational attainment; however, childhood residential background plays a more important role in educational attainment than religious background.

Age at First Marriage

It was hypothesized that childhood residential background, religious background, and educational attainment would have a positive influence on age at first marriage. Specifically, the greater the urbanity of the women's childhood residence, affiliation with the Christian religion and the greater the level of educational attainment the later the age at first marriage. The data indicate support for each of the hypotheses. Each of the

above variables exhibits a significant positive effect on age at marriage. The coefficients for childhood residential background and religious background are statistically significant at the 0.01 level of probability while the coefficient for educational attainment is significant at the 0.001 level of probability.

Of the three variables the direct effect of educational attainment (.460) is nearly five times greater than that found for residential background (.102) and religious background (.095). Only a small portion of the total association between each of the three variables and age at first marriage is due to joint association. The three variables combined explain about 28 percent of the variation in age at marriage.

An analysis of the indirect effects reveals that nearly two-thirds of the total effect of residential background on age at first marriage is an indirect effect via educational attainment. Correspondingly, the indirect effect of religious background on age at marriage is approximately one half of the total effect.

In summary, childhood residential and religious background exert a positive direct influence on age at marriage; however, a sizeable portion of their total effects on age at first marriage is transmitted via educational attainment. Moreover, higher levels of educational attainment produce a later age at first marriage. Thus, educational attainment plays an important role in deferral of marriage both directly and as a prime intervening variable mediating between the residential and religious background of these women and their age at first marriage.

Timing of First Birth

It was hypothesized that childhood residential background, religious background, and educational attainment would have a positive influence on timing of first birth, while age at first marriage would have a negative influence on timing of first birth. Specifically, the greater the urbanity of the women's childhood residence, affiliation with the Christian religion and the greater the level of educational attainment the longer would be the interval between marriage and first birth while the later the age at first marriage the shorter the interval between marriage and first birth.

The findings on the above hypotheses are mixed. On the one hand, childhood residential background and religious background exhibit a positive influence on timing of first birth as anticipated. However, educational attainment and age at first marriage have a negative influence on timing of first birth, contrary to expectations. However, the coefficients for childhood residential background, religious background and educational attainment are not statistically significant. Age at first marriage is the only variable exhibiting a significant negative effect (0.01 level of probability) on timing of first birth.

Of the four independent variables, the direct effect of age at first marriage ($-.353$) is absolutely greater than any of the other variables. Only a small portion of the total association between each of the four variables and timing of first birth is due to joint associations. The four variables combined explain about 14 percent of the variation in timing of first birth.

An analysis of the indirect effects reveals that the indirect effects of childhood residential background and religious background are negative, in contrast to their positive (although nonsignificant) direct effects on timing of first birth. Moreover, the size of the indirect effects for each of the two variables is considerably above the magnitude of the direct effect. Tracing through the indirect paths a roughly even split between educational attainment and age at marriage can be detected. Finally, about four-fifths of the negative total effect of educational attainment on timing of first birth is indirect

effect via age at first marriage.

In summary, the direct effects of residential background, religious background and educational attainment on timing of first birth are not statistically significant. Moreover, the negative direct effect of educational attainment is counter to expectations. Only age at marriage has a significant direct effect on timing of first birth. The influence of childhood residential background and religious background on timing of first birth is primarily a negative indirect effect equivalently distributed between educational attainment and age at marriage. The effect of educational attainment on timing of first birth is likewise primarily a negative indirect effect through age at marriage. Thus, age at first marriage plays an important role in reducing the timing of first birth directly and as a prime intervening variable mediating between educational attainment and timing of first birth.

Infant and Child Mortality

It was hypothesized that childhood residential background, religious background, educational attainment, age at first marriage, and timing of first birth would have a negative influence on infant and child mortality. Specifically, the greater the urbanity of the women's childhood residence, affiliation with the Christian religion, the greater the level of educational attainment, the later the age at first marriage and the longer the interval between marriage and first birth the lower would be the level of infant and child mortality.

Except for childhood residential background, all variables exhibit the anticipated negative influence on infant and child mortality. Childhood residential background reveals a positive direct effect on infant and child mortality but it is not statistically significant. Furthermore, although their effects are in the hypothesized directions, religious background and timing of first birth do not exhibit a significant influence on infant and child mortality. Of the above five independent variables, only the coefficients for educational attainment and age at first marriage demonstrate a significant negative influence on infant and child mortality. The coefficients for educational attainment are statistically significant at the 0.05 level of probability while the coefficient for age at first marriage is significant at the 0.001 level of probability.

Of the two significant variables, the direct effect of age at first marriage ($-.227$) is nearly three times greater than that found for educational attainment ($-.085$). An inspection of the joint associations for each of the independent variables reveals that only for timing of first birth is the joint association sizeable. Specifically, the positive total association between timing of first birth and child mortality is due to its association with other antecedent variables. The independent variables combined explain about seven percent of the variation in infant and childhood mortality, of which the bulk is accounted for by educational attainment and age at first marriage.

An analysis of the indirect effects reveals that the sizeable portion of the influence of childhood residential background on infant and child mortality is primarily due to indirect effect rather than direct effect ($-.101$ vs. $.039$). The basic path of the negative indirect effect is through educational attainment. About two-thirds of the total effect of religious background and nearly three-fifths of the total effect of educational attainment on infant and child mortality are indirect. Two-thirds of the negative indirect effect for religious background is via educational attainment while the primary path of the negative indirect effect for educational attainment is via age at marriage. Finally, the effect of age at marriage on infant and child mortality is predominantly direct with the indirect effect virtually nil.

In summary, only educational attainment and age at first marriage exert a significant effect on infant and child mortality. For the two background variables, negative indirect paths exceed the direct effects in magnitude. The primary variable through which these indirect effects flow is educational attainment. Educational attainment affects infant and child mortality not only in a direct negative manner but also, to a large extent, negatively through age at marriage. Finally, the influence of age at first marriage is primarily direct and negative with the direct effect of age at first marriage considerably exceeding that of the other variables. Thus, age at marriage operates in such a way as to affect infant and child mortality directly and as a prime intervening variable for transmission of the effects of educational attainment on infant and child mortality.

Marital Fertility

It was hypothesized that childhood residential background, religious background, educational attainment, age at first marriage and timing of first birth would have a negative influence on marital fertility while infant and childhood mortality would have a positive influence on marital fertility. Specifically, the greater the urbanity of the women's childhood residence, affiliation with the Christian religion, the greater the level of educational attainment, the later the age at first marriage, and the later the timing of first birth the lower would be marital fertility while the lower the level of infant and childhood mortality the lower the level of marital fertility.

The data indicate that, with the exception of age at marriage, all relationships are in the expected direction. The direct effects of childhood residential background, educational attainment, timing of first birth and infant and child mortality on marital fertility are statistically significant. The coefficients for childhood residential background and timing of first birth are statistically significant at the 0.01 level of probability while the coefficients for educational attainment and infant and child mortality are significant at the 0.01 level of probability.

Of the four significant variables the direct effects of educational attainment (-.165) and infant and childhood mortality (.214) are considerably larger than those found for either childhood residential background (.095) or timing of first birth (.098). While only a small portion of the total association between each of the other five variables and marital fertility is due to joint associations, the portion of joint association for age at first marriage is sizeable. Approximately 11 percent of variation in marital fertility is explained by the variables included in the model.

An analysis of the indirect effects reveals that only a small portion of the total effect for each of the independent variables is due to indirect effects with the notable exception of the indirect effect of childhood residential background via educational attainment. Nearly one-half of the total effect of childhood residential background on marital fertility is an indirect effect via educational attainment.

In summary, the direct effects of religious background and age at first marriage on marital fertility are not statistically significant. Likewise, the indirect effects of both these variables are small. The indirect effect of religious background on marital fertility is not large enough to be significant and that of age at first marriage is mixed. It is positive in the timing of first birth and negative in infant and child mortality. However, age at first marriage is deeply related to marital fertility through the other independent variables. Childhood residential background, educational attainment, timing of first birth and infant and child mortality exert significant direct effects on marital fertility. Of them infant and child mortality is the strongest factor explaining nearly five percent of the variation in marital fertility. However, only slightly less im-

as a prime intervening variable mediating between the residential and religious background of these women and their age at first marriage.

- 3) The direct effects of residential background, religious background and educational attainment on timing of first birth were not statistically significant and the negative direct effect of educational attainment was counter to expectation. Only the age at first birth both directly and as a prime intervening variable mediating between educational attainment and timing of first birth.
- 4) The direct effects of childhood residential background, religious background and timing of first birth on infant and child mortality was not statistically significant. Only educational attainment and age at first marriage exerted a significant negative effect on infant and child mortality. Educational attainment and age at first marriage, also, played an important role as primary intervening variables for transmitting the effects of childhood residential background and educational attainment on infant and child mortality respectively
- 5) The direct effect of religious background and age at first marriage on marital fertility are not statistically significant. Childhood residential background, educational attainment, timing of first birth and infant and child mortality did exert significant direct effects on marital fertility. The incidence of infant and child mortality's direct effect was somewhat greater than that of educational attainment. However, educa-

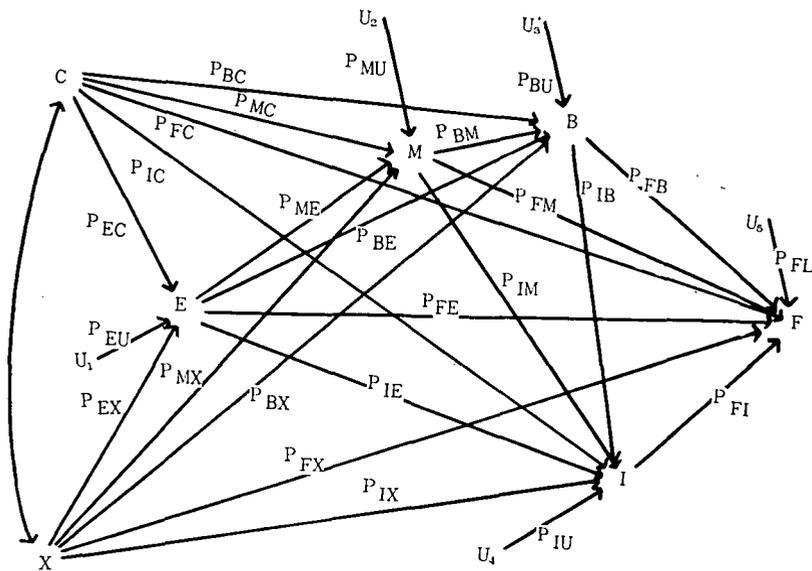


Figure 2. Structural equation model.

Note: **—** = Significant at 0.001 level
— = Significant at 0.05 or 0.01 level
 Paths for non-significant effects are not shown.
 C: Childhood Residential Background
 X: Religious Background
 E: Educational Attainment
 M: Age at First Marriage
 B: Timing of First Birth
 I: Infant and Childhood Mortality
 F: Marital Fertility

tional attainment plays an important role in lowering marital fertility both directly and as an intervening variable mediating between childhood residential background and religious background and marital fertility.

In conclusion, of the twenty original hypotheses for the entire sample, twelve were supported while eight were not supported (see Table 4 and Figure 2)

Three effects were found to flow in a direction opposite to what was anticipated (that is, the effects of educational attainment on timing of first birth, childhood residential background on infant and child mortality, and age at first marriage on marital fertility). However, the above three effects were not statistically significant. Among all significant relationships, no effects were contrary to expectation.

V. DISCUSSION

This section contains a discussion of the theoretical implications of the study findings. The topics are oriented about the major study objectives outlined in the Introduction. Specifically, the subsections comprise:

- (1) Childhood residential background and educational attainment;
- (2) Social origins and family formation;
- (3) Educational attainment and family formation; and
- (4) Relationships among family formation variables.

Childhood Residential Background and Educational Attainment

In this study, it was found that the influence of childhood residential background on educational attainment was stronger than that of religious background. This finding among Korean women is different from findings emerging from studies done in the United States. For example, Featherman (1971) noted, in analyzing white residents in United States metropolitan areas, that residential background explained only 0.2 percent of the variation in educational attainment. Warren (1970), in an analysis of religious preference and other characteristics in determining educational attainment levels in the United States, found that religious preference alone accounted for five to nine percent of the variation in educational attainment. From these findings, it might be assumed that religious influence on educational attainment is stronger than residence in the United States.

Contrary to the United States experience, the influence of residence is much stronger (more than 5 times) than religious influence on educational attainment in Korea. The reason may be found in Korean religion history. Although Christianity was introduced into Korea in the 17th century, it began to expand only after World War II. In contrast to Christianity, the non-Christian religions such as Buddhism and Confucianism have more than five centuries history. Cultural values and social customs have been formed on the base of Buddhism and Confucianism (Lee et al., 1978). Christians follow naturally the same behavior pattern as non-Christians through these values and customs.

A second plausible reason is that a sizeable discrepancy exists between urban and rural areas in Korea (WFS, 1978). As has been demonstrated previously, rurally-based population groups generally have greater handicaps in attaining higher educational levels than those in urban areas because of large family size, low socio-economic status parents (Featherman, 1971), lack of educational facilities (Holsinger and Kasarda, 1976), less influence of "significant others" (e.g., teacher, close friend, employer) (Otto, 1978), and less work opportunities (Burchinal, 1960). Thus, there would be a much greater gap between rural and urban raised Korean women in their respective levels of educational

attainment.

Social Origins and Family Formation

Childhood residential background and religious background both exerted a strong positive influence on age at first marriage. From these findings it can be assumed that women who were raised in areas and/or adhere to traditional religions tend to follow traditional customs and marry early, while those who were raised in urban areas and/or adhere to Christian religion tend to marry later.

The influences of both childhood residential background and religious background on timing of first birth and infant and childhood mortality was negligible. However, the influence of childhood residential background on infant and childhood mortality has a meaning to be mentioned.

Religious background has no influence on marital fertility while the influence of residential background on marital fertility is sizeable. Because the effect of childhood residential background is always shown in the educational attainment and in the family formation process, childhood residence should be considered whenever socialization is studied in Korea.

A sizeable portion of the total effect of childhood residential background and religious background on age at first marriage and marital fertility is transmitted through educational attainment. However, the influence of childhood residential background and religious background on timing of first birth is equivalently distributed between educational attainment and age at first marriage.

Educational Attainment and Family Formation

In this section the initial focus of discussion is on the effect of educational attainment on age at first marriage, timing of first birth, infant and child mortality, and marital fertility.

Educational attainment directly effects age at first marriage. As expected and found in other studies, educational attainment exerted a strong positive influence on age at first marriage. Therefore, educational attainment is a critical determinant of age at first marriage with approximately the same effect as found in other developed and developing countries.

Educational attainment, however, had a negative influence upon the timing of first birth contrary to expectation. Bartz and Nye (1970) have argued that in the United States, couples with lower levels of education marry and have their first child earlier because they have less incentive to delay family formation. On the other hand, highly educated women perceive an early first child as detrimental to social equality and mobility. These women believe that leaving the labor force hinders professional future. Bartz and Nye's (1970) assumptions, however, are not borne out in Korea.

One of the reasons why higher educational attainment results in an earlier arrival of the first child may be found in the society's culture. Beliefs that married women should have children is strong in developing countries because women without children have low status or position. Thus, women with advanced levels of educational attainment, still subject to normative pressures, may have a more rapid first birth to compensate for time lost. Alternatively, educated women wishing to participate in non-familial roles may attempt to bear children rapidly subsequent to marriage to promote a more rapid return to non-familial band activities.

Educational attainment exerted a significant negative influence on overall infant and

childhood mortality. This finding is supportive of other studies which show that more educated women have less maternal and infant and childhood mortality (see, for example, Choe and Kong, 1977). One reason for this finding might be that women with high levels of education have greater knowledge regarding child care. It should also be mentioned, however, that a physiological reason might underly this pattern. Specifically, women with low levels of education might have experienced fatal mortality during their first pregnancy, there by lengthening the interval between marriage and first live birth. On the other hand, women with higher levels of education would have been less likely to experience a miscarriage during their first pregnancy.

The negative direct effect of educational attainment on marital fertility is highly significant. Therefore, the uncovering of this relationship in Korea supports findings in other countries such as Puerto Rico (Schultz, 1969), Greece (Drakatas, 1969), and the United States (Cain and Weiniger, 1973). Several investigations have pointed out that the relationship between educational attainment and marital fertility is a complex one and its effect on marital fertility is indirect as well as direct. Indeed, some doubts have been expressed regarding the direct effect of education on marital fertility. According to this reasoning, virtually all of the effects of educational attainment on marital fertility operate only through prior family formation variables such as age at first marriage and timing of first birth. On the other hand, Janowitz (1976), and Holsinger and Kasarda (1976) argue that direct effects are present. Viewing marital fertility more broadly to include certain personal dispositions and preferences instead of marital fertility as a consummate result, they state that educational attainment has both a direct and indirect influence on marital fertility. Educational attainment directly affects marital fertility through desired family size and it indirectly affects marital fertility by widening women's horizons through prior family formation variables. The finding of this research supports the latter position in that both direct and indirect effects are noted. Nevertheless, the direct effect of educational attainment on marital fertility was greater than the indirect effect through age at first marriage and timing of first birth, etc.

Relationships among Family Formation Variables

This segment consists of a discussion of the effects of: (1) age at first marriage on timing of first birth, infant and childhood mortality; (2) age at first marriage on marital fertility; and (3) timing of first birth and infant and child mortality on marital fertility.

The findings demonstrated a strong negative effect of age at first marriage on timing of first birth and infant and childhood mortality. Therefore, Ewer and Crimmins Gardner's (1978) finding of a close link between age at first marriage and timing of first birth in the United States is supported by this finding. Specifically, older brides have children more quickly than younger brides when older brides do begin having children.

This finding in both developed and developing countries is represented indirectly in the fact that women's major role is a familial role, especially child-bearing. Thus, women marrying later, still subject to normative pressures, may have a more rapid first birth to compensate for time lost. Alternatively, women marrying later and wishing to participate in non-familial roles may attempt to bear children rapidly subsequent to marriage to promote a more rapid return to non-familial activities.

While there are few contradictory theories on the negative relationship between age at first marriage and timing of first birth, two contradictory arguments surround the relationship between age at first marriage and infant and child mortality. Knodel (1978) states that the later the age at marriage the greater the infant and child mortality because of decreased reproductivity and health of older women. On the other hand,

McKeown(1976) stresses a negative relationship between age at first marriage and infant and child mortality arguing that women who marry late tend to have a smaller number of children and provide them with good care. The finding of this analysis is in agreement with McKeown's (1976) argument.

Unexpected results appeared in the analysis of the direct effect of age at first marriage on marital fertility. Specifically, the direct effect was not significant. Many studies (Davis and Blake, 1956; Jill *et al.*, 1959; Freedman, 1961) have found that the younger the age at marriage the higher the ultimate fertility. Thus, it has often been concluded that early marriage is one of the major factors producing large family size, and correspondingly, delayed marriage was one of the major ways to reduce fertility and, hence, population growth (Coale and Tye, 1961; Leasure, 1963). However Glass and Grebenick (1954) and Matsas (1965) emphasized the decreasing importance of age at marriage in predicting fertility in developed countries due to the widespread adoption of birth control methods.

The study supports the latter argument of age at first marriage on subsequent fertility. However, the reason for this should be studied in greater detail. Until now, there have been two kinds of interpretation respecting the age at marriage-marital fertility relationship. One suggests a direct relation between age at first marriage and duration of marriage. Women who marry early spend a longer portion of their reproductive period with a mate, hence, they have a longer period of exposure to pregnancy. The result of this pattern is that women marrying earlier have more children. A second reason is that women marrying early are more oriented to traditional customs than those marrying later. The former interpretation is based on physiological and the latter on sociological reasoning. The latter approach is appropriate to this study's purpose. Thus, the definition of marital fertility was defined as the rate resulting from the number of children ever born minus one divided by the number of years from first birth to the date of survey. Thus, this finding rejects the hypothesis that age at first marriage influences marital fertility sociologically. Rather we find that its impact is a purely physiological one. This finding is the same as found in Childambaram and Zodgekar's (1969) analysis of Indian women. They found in an analysis of the relationship between age at marriage, first birth interval, and marital fertility that age at first marriage had no direct effect on marital fertility but only an effect on lowering the interval between marriage and arrival of the first child.

The indirect effects of age at first marriage on marital fertility are compensating. One indirect effect (*via* timing of first birth) increases fertility and the other (*via* infant and child mortality) decreases fertility. Women who marry relatively later have an earlier first birth and earlier first births are associated with higher fertility. Therefore, the influence through timing of first birth is positive and that through infant and child mortality is negative.

This study finds that the influence of infant and child mortality is greater than that of timing of first birth on marital fertility. These findings seem to result from the fact that, although a shorter interval between marriage and first birth results in higher subsequent fertility, some women with intention to participate in non-familial roles tend to have shorter intervals but have smaller numbers of children. Therefore, the effect of timing of first birth on marital fertility is possibly attenuated by these women's smaller desired family size. The effect of infant and childhood mortality, however, supports the replacement theory. Specifically, women who lost children want to have other children as replacement. Therefore, infant and child mortality is stronger than timing of first birth.

VI. POLICY IMPLICATIONS

Current national family planning programs of South Korea are faced with the limitation of conventional action oriented programs and the need to improve the situation as other developing countries are doing. The decreased efficiency of conventional family planning programs has been due to an emphasis on developing the means (i.e., contraceptive practice including sterilization and abortion) rather than in modification of fertility goal (i.e., orientation towards a small family) (U.N., 1974).

Reproductive behavior, as all human behavior, is the result of the interaction of a variety of social factors. If it is to be modified in a given direction, one is faced, in turn, with the decision of the most appropriate means to induce that change. Therefore, programs for modification of family size goals should be stressed as well as those stressing knowledge and dissemination of contraceptive methods.

This problem of modification of reproductive behavior cannot be solved in isolation. It must accompany the formulation of a rational frame work. Orientation of reproductive behavior depends upon the significance of children in the development of family life and the satisfaction of the couple's need. It may be assumed that reproductive behavior depends principally upon structural factors at the macro-social level. In other words, the findings in these individual models could be applied to the macrosocial structure. That is, the major influencing factors on marital fertility such as childhood residential background, educational attainment, infant and child mortality and labor force experience could be applied to the population policies of urbanization, education, social security system (including health program), and economic development plan carried out at the highest levels.

Therefore, Korean population policy should emphasize:

1) The improvement of educational facilities in rural areas:

The educational system is one of the most effective means to break down traditional values. In South Korea, rural areas are imbued with a very strong conservatism which fosters large family size norms. In this society, it is not deemed desirable for women to participate in non-familial based activities and to control the number of children. Also, there are no groups or associations oriented towards women's activities. Therefore, the only possible way to affect change is for the school to give more knowledge for women and to become a center for community activities.

2) The extension and supplementing of the social security system:

Studies of women reveal a high positive relationship between infant and child mortality and marital fertility. Given this high replacement pattern, it is assumed that every woman has a desire to have children to provide social security for laterlife as well as to maintain her status. Therefore, the present well developed "social security system" provided by society today through the extended family system would be weakened.

Through the above programs, women would modify their attitudes in respect to the value of having many children. In conclusion, this study strongly supports a policy for extension of educational facilities and of a social security system

References

Ben-Parath Y.

1976 Fertility response to child mortality: Microdata from Israel. *Journal of Political Economy* 84:163

- Blalock, Hubert M., Jr.
 1964 *Causal Inferences in Nonexperimental Research*. Chapel Hill: Univ. of North Carolina Press.
 1972 *Social Statistics*. New York: McGraw-Hill.
- Bordau, D.J.
 1960 Educational aspirations and Parental stress on College plans. *Social Forces* 38:262-269
- Burchinal, Lee G.
 1960 Research on young marriage: implication for family life education. *The Family Coordination* 9:6-24
- Burchinal, L.G. and Chancellor, L.
 1963 Social status, religious affiliation, and age at marriage. *Journal of Marriage and the Family* 25:219-221.
- Butler, N.R. and Bonhan, D.G.
 1963 Prenatal Mortality Edinvorgh and London: E & S. Livingstone.
- Cain, G.G. and Weininger, A.
 1973 Economic determinants of fertility results from cross-sectional aggregate data. *Demography* 10:205-223.
- Chidambaram, V.C and Zodgekar, A.V.
 1969 Increasing Female Age at Marriage in India and Impact on the First Birth Interval: An Empirical Analysis (Mimeo). *Population Council* 2(25). N.Y.
- Cho, L-J., and Retherford, R.D.
 1974 Comparative analysis of recent fertility trends in East Asia. *International Population Conference, Liege* (=International Union) 1973, 2:168-181.
- Choe, E.H. and Kong, S.K.
 1977 Changing Fertility and Pattern of Contraceptive Use. Korean Institute for Family Planning: Seoul, Korea.
- Chung, Bom-Mo, Palmore, Jamer A., Lee, Sang Joo, and Lee, Sung Jin
 1972 *Psychological Perspectives: Family Planning in Korea*. Korea: Korean Institute for Research in the Behavioral Sciences.
- Coale, Amsley J. and Tye C.V.
 1961 The significance of age-patterns of fertility in high fertility population. *Milbank Memorial Fund Quarterly* 39:631-646.
- Davis, Kingsley
 1955 Institutional patterns favoring high fertility in under developed area. *Eugenics Quarterly* 2:33-39.
 1967 Population policy: will current programs succeed?. *Science* 158 (Nov.): 730-739.
- Drakatas, C.G.
 1969 The determinants of birth rate in developing countries: an econometric study of Greece. *Economic Development and Cultural Change*, 17:593-603.
- Duncan, Otis Dudley
 1966 Path analysis: sociological examples. *American Journal of Sociology* 72:1-16.
- Duva Evelyn
 1957 *Family Development*. Chicago: J.B. Lippincott.
- Ewer, Phyllis A. and Crimmins Gardner, Eileen
 1978 Wife's age at marriage, at first birth and sex role attitudes as predictors of fertility and working. Paper presented at the 73rd Annual Meeting of the American Sociological Association (Sept.).
- Freedman, R. and Whelpton P.K.
 1950 Fertility planning and fertility rates by religious interest and denominations. *Milbank Memorial Fund Quarterly* 28:294-343.
 1961 The sociology of human fertility: a trend report and bibliography. *Current Sociology* 10-11:35
- Germain, Adrienne
 1975 Status and roles of women as factors in fertility behavior: a policy analysis. *Studies on Family Planning* 6:192-200.

- Glass, D.V. and Grebenick, E.
1954 The trend and patterns of fertility in Great Britain. Papers of the Royal Commission of Population. VI. London: HM Stationary Office.
- Goldberg, Arthur S.
1959 The fertility of two-generation urbanities. *Population Studies* 12:214-222.
- Glodberger, Arther S. and Duncan, Otis Dudley(eds.)
1973 *Structural Equation Models in the Social Sciences*. New York: Academic Press.
- Haller, A.D. and Sewell, William H.
1967 Occupational choices of Wisconsin farm boys. *Rural Sociology* 32(March):37-55.
- Holsinger, Donald B., and Kasarda, John D.
1976 Education and human fertility: sociological perspective. pp. 154-181 in Ridker, Ronald G.(ed.), *Population and Development-The Search for Selective Interventions*. Baltimore and London: The Johns Hopkins Univ. Press.
- Janowitz, B.
1976 An analysis of the impact of education on family size. *Demography* 13:189-198.
- KIFP
1973 Report on 1971 Fertility-Abortion Survey. Seoul, Korea.
1978 The National Fertility and Family Planning Evaluation Survey. Korean Institute for Family Planning, Seoul, Korea.
- Kim, Mo-Im, Rider, R., Harper, P., and Yang, J-M.
1974 Age at marriage, family planning practices, and other variable as correlaties of fertility in Korea. *Demography* 11(4):641-656.
- Knodel, John
1978 Natural fertility in pre-industrial Germany. *Population Studies*, 32-3:481-510.
- Kunstadter, Peter
1978 Child mortality and maternal parity. *International Family Planning Perspectives and Digest Vol. 4*.
- Laebner, H. and Driver, E.D.
1973 Differential fertility in Central India: a path analysis. *Demography* 10(3):329-350.
- Land, Kenneh C.
1969 Principles of path analysis. pp. 3-37 in Borgatta, E.F.(ed.), *Sociological Methodology*. San Francisco: Jossey-Bass.
- Leasure, J. William
1963 Malthus, marriage, and multiplication. *Milbank Memorial Fund Quarterly* 41:419-436.
- Lee, H.Y., and Kwon, T.H.(ed.)
1978 *Korean Society: Population and Development*. The Population and Development Studies Center: Seoul, Korea.
- Matras, Judah
1965 The social strategy of family formation:some variation in time and space. *Demography* 2:349-362.
- McKeown, Thomas
1976 *The Modern Rise of Populations*. London: Edward Arnold.
- Otto, Luther B.
1978 *Antecedents and Consequences of Marital Timing*. Unpublished paper, Omaha Nebraska: The Boys Town Center for the Study on Youth Development 1970.
- Palmer, James A. and Marzuki, A.
1969 Marriage patterns and cumulative fertility in West Malaysia, 1966-1967. *Demography* 6(4):383-401.
- Rosenwaike, Ira
1972 Factors associated with religious and civil marriages *Demography* 9(Feb.):129-141.
- Rutstein, S.O.
1974 The influence of child mortality on fertility in Taiwan. *Studies in Family Planning* 5: 182-188.
- Schultz, Pual T.
1969 An economic model of family planning and fertility. *Journal of Political Economy* 77:

153-180.

Smith, Peter C.

1971 Philippine regional and provincial differentials in marriage and family building: 1960. *Philippine Sociological Review* 19:159-181.

1977 Tradition and Transition in South, Southeast and East Asian Nuptiality. Paper presented at the 1977 Annual Meeting of the Population Association of America (April), Saint Louis, Missouri.

Smith, Peter C. and Karim, Mehlab

1978 Urbanization, Education and Nuptiality Transition in Four Asian Societies. Paper presented for the conference on comparative fertility transition in Asia, Tokyo, Japan (March).

Sorokin, P., Zimmerman, C.C., and Galpin, C.J.

1931 *A Systematic Source Book in Rural Sociology*. Vol. II. Minneapolis: University of Minnesota Press.

United Nations

1974 *The Population Debate: Dimension and Perspectives*, Vol 2. United Nations: N.Y: N.Y.

Warren, B.L.

1970 *The Relationship between Religious Preference and Socio-economic Achievement of American Men*. Unpublished doctoral dissertation, Univ. of Michigan.

가족형성에 있어서의 교육의 역할

金 聖 二

이 연구는 교육과 가족형성 관계를 규정하기 위하여 1971년 현재 혼전 출산경험이 없으며, 1명 이상의 자녀를 가진 이혼 경험이 없는 30세에서 44세의 주부 988명을 대상으로 조사되었다. 가족생활 주거 이론 및 가족형성에 관련되는 이론들을 바탕으로 성장지, 종교, 교육정도, 초혼년령, 초산간격, 영아사망을 및 결혼 출산력 등의 변수로 구성된 발전모형이 준비되었다. 이 발전모형을 인과분석 방법을 적용하여 분석한 결과 다음과 같은 사실이 발견되었다.

성장지와 종교는 교육에 모두 중요한 영향을 주나 성장지의 영향력이 보다 컸다. 또한 이 성장지는 교육정도를 통하여 가족형성의 다른 변수들에게 지속적인 영향을 주고 있었다.

교육정도는 초혼년령, 영아사망을 및 결혼출산력에 의미있는 영향을 주고 있었다. 특히 교육정도의 결혼출산력에 대한 직접효과는 초혼년령이나 초산간격을 통한 간접효과보다 컸다. 초혼년령은 초산간격과 영아 사망율에 강한 영향력을 행사했음에 반하여 결혼출산력에 대한 직접적 영향력은 적었다. 즉 초혼년령은 초산간격과 영아사망을 통한 간접효과를 통해 결혼 출산력에 영향을 주고 있음이 밝혀졌다. 영아 사망율은 초산간격보다 더 강하게 결혼출산력에 영향을 미치고 있었다.

결론적으로 말해서, 사회적 배경은 교육정도에 크게 영향을 미치고 있고 이 교육정도를 통해서, 가족형성에 간접적으로 영향을 미치고 있었다. 또한 교육정도는 직접적으로 또 중개자로서 가족형성 과정에 중요한 역할을 하고 있음을 찾아볼 수 있었다.