DOCUMENT RESUME

ED 143 481 RC 010 064

AUTHOR Johnson, Nan E.; And Others
TITLE Farm-Nonfarm Differentials in Fertility: The Effects of Compositional and Sex-Role Factors.
PUB DATE Sep 77
NOTE 44p.; Paper presented at the Annual Meeting of the Rural Sociological Society (Madison, Wisconsin, September 1977)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS Academic Achievement; Age Differences; *Beliefs; *Birth Rate; *Females; Group Norms; Hypothesis Testing; Labor Force; Marital Instability; Marriage; National Surveys; Racial Differences; Religion; Rural Population; *Rural Urban Differences; *Sex Role
IDENTIFIERS National Fertility Study; Nonfarm Population; *Place of Residence; *Traditionalism

ABSTRACT

Data derived from the 1970 National Fertility Study (NFS II included post-married women, information on all compositional factors for each respondent, and an 18-item section on sex-role ideology) were used to test the following hypotheses: farm women are more traditional in sex-role ideology than nonfarm women; the higher the sex-role traditionalism, the higher the actual fertility; the higher farm than nonfarm fertility will be sustained after age at first marriage, education, marital instability, labor force participation, religion, race, and duration of marriage have been controlled; the farm-nonfarm fertility differential will disappear after these same variables and sex-role ideology have been controlled. Sex-role ideology included dimensions of captured normative orientations re: female rights of access to extrafamilial roles; beliefs about the consequences to a woman and her family of procreation that such norms presuppose; and beliefs regarding innate physiological, psychological, or mental capacities conditioned by gender. Results indicated support for hypotheses I and II and lack of support for hypotheses III and IV; however, it was suggested that although residence had the smallest statistically significant regression weight, the very uneven division of the sample between farm and nonfarm categories (6% vs 94%) might account for an underestimation of the effect of residence, particularly since rural nonfarm was subsumed in the nonfarm category. (JC)

Farm-Nonfarm Differentials in Fertility: The Effects of Compositional and Sex-Role Factors

Nan E. Johnson
Department of Sociology
Michigan State University

C. Shannon Stokes and Rex H. Warland
Department of Agricultural Economics and Rural Sociology
The Pennsylvania State University

Paper for presentation at the annual meeting of the Rural Sociological Society, Madison, Wisconsin, September, 1977.

Introduction

One tradition within demography has viewed rural-urban differences in fertility as a function of the demographic transition (Abu-Lughod, 1964). According to this perspective, no rural-urban differences exist in the initial stage of the demographic transition, when birth rates everywhere are high and uncontrolled. During the transitional phase, rural-urban differences in fertility are thought to emerge when fertility control is first initiated among the urban upper classes. As contraceptive technology is diffused successively to the urban lower classes, the rural-to-urban migrants, and the rural nonmigrants, fertility differentials by rural-urban residence increase. When the birth rate becomes low and controlled in the terminal phase of the demographic transition, economic and cultural dominance of the rural hinterland by the city renders rural and urban differences in fertility nonsignificant.

Despite the predictions of transition theory, a large rural-urban difference in fertility is still observed in those countries of northern and western Europe where the demographic transition has been underway longest (Aalen, 1963; Freedman et al., 1959a; Glass, 1968). The persistence of this differential in the United States has also been documented (Beegle, 1966; Brunner and Kolb, 1933; Duncan, 1950; Duncan and Reiss, 1956; Sydenstricker and Notestein, 1930; Thompson and Jackson, 1940; U.S. Bureau of the Census, 1973a), although notable exceptions have occurred (Goldberg, 1959 and 1960; Freedman and Slesinger, 1961; Duncan, 1965; Slesinger, 1974). Furthermore, a recent study by Rice and Beegle (1972).

found that the rural-urban fertility differential was greater in metropolitan than in nonmetropolitan areas. This finding suggests that as the nation proceeds into the post-industrial stage, rural-urban differences may become more pronounced rather than smaller.

In addition to a continued rural-urban gradient in fertility, a gradient pattern for conservatism in a variety of attitudes, beliefs, and norms has been frequently reported (Glenn and Alston, 1967; Glenn and Hill, 1977; Willits et al., 1974). One study presented evidence that the inverse relationship between population size and social conservatism has grown stronger over time (Willits et al., 1973). A few sociologists have suggested a theoretical linkage between the gradient patterns for social conservatism and fertility, but no national-level studies to date have empirically examined this relationship. Consequently, the purpose of this study is to examine sex-role ideology, a salient aspect of social conservatism, as a critical interpretive link in the residence-fertility relationship.

The residential categories of interest in this study are farm and nonfarm residence. If residence is an indicator of social isolation, farm dwellers should be the most isolated. The stability of the farm-nonfarm fertility differential in juxtaposition to the shrinkage of the rural-urban differential after the end of the postwar baby boom (Rindfuss and Sweet, 1975), supports the distinct importance of farm residence for fertility.

Two Categories of Explanatory Variables

One reason why rural women have higher fertility than urban women is that the two populations have differing social compositions. Since fertility varies by certain social characteristics, such as age at marriage and labor force participation, variations in childbearing between farm and nonfarm women may result from the residential distribution of those social characteristics. A corollary to this point of view is that if the city increases its dominance of the hinterland such that rural and urban populations come to share more similar social characteristics, the fertility differences between the two populations will diminish. The social characteristics seen as accounting for differences in rural-urban fertility may be termed compositional explanations.

A considerable body of theory has been formulated to argue that ecological factors by which rural and urban populations differ give rise to unique norms, beliefs, values and customs which are peculiar to residents within the population, regardless of their social characteristics (Fischer, 1972, 1973a, 1973b, 1975a, 1975b; Simmel, 1951; Willits and Bealer, 1963). If these norms and beliefs govern the process of family formation and the ways in which men and women relate to each other, the norms and beliefs may have causal import for fertility. A logical extension of this paradigm argues that if ecological differences between rural and urban populations do not change through time, the differences in fertility between rural and urban residents will

not diminish. The norms, beliefs, values and customs which may account for differences in fertility between rural and urban women may be termed cultural explanations. In summary, the cultural explanations approach does not deny the utility of compositional factors for explicating human fertility differentials, but it asserts that norms and beliefs must constitute a part of the explanation.

Compositional Factors

There are five social factors by which rural and urban populations are differentially composed in such a manner that higher rural fertility is enhanced. Specifically, female labor force participation and education have displayed inverse relationships with city size and distance from an urban center (Tarver, 1969; 1970). Similarly, gradient patterns have been reported by age at first marriage (U.S. Bureau of the Census, 1973a) and duration of marriage (U.S. Bureau of the Census, 1973b). Farm women (Bumpass and Sweet, 1972) and rural women (Ritchey, 1973) are less prone to marital disruption than are nonfarm and urban women. As absence from the labor force, low educational attainment, young age at first marriage, longer duration of marriage, and lack of marital disruption have each been associated with high fertility in past research, each of these five factors provides an alternative hypothesis to the idea that residence exerts an independent effect upon fertility.

Two factors by which rural and urban populations are differentially composed may suppress the fertility differential between rural and urban areas. One factor is race: blacks are more concentrated in urban than in

rural places of residence (U.S. Bureau of the Census, 1972). The second factor is religion: Catholics are found more frequently in urban than in rural places (Whelpton et al., 1966). Since blacks and Catholics are characterized by higher fertility, their proclivity toward urban residence may operate to minimize the disparity between urban and rural patterns of childbearing.

There are at least three ways by which compositional factors may be said to explain the effect of rural-urban residence upon fertility. For example, Slesinger (1974) found support for the argument that variance in fertility was better explained by duration of marriage, work experience, religion, and education than by size of place, distance from metropolitan center, or the Stoeckel-Beegle size-distance index. In other words, large inverse correlations between fertility and each of the residence measures were obtained because of strong correlations between residence and each of the four compositional variables. As a consequence, the compositional variables may be said to explain the rural-urban fertility differential if the correlation between residence and fertility is not significantly different from zero when the main effects of the compositional variables have been removed from residence.

A second way that the compositional variables may explain the farm-nonfarm differences in fertility is through their interaction. For example, Bumpass (1969) found that the separate effects upon fertility of both age at marriage and education were not uniform across all levels of the other variable but varied together. Specifically, the joint effect of early marriage and low education was found to predict higher fertility

than each individual effect of these two categories considered separately. As a consequence, the fact that farm women are more characterized by joint membership in the early-marriage and low-education categories might explain their higher cumulative fertility. Since this second way in which compositional variables may affect fertility was unexplored by Sresinger, the current study represents an extension of her work.

A third way in which the compositional factors might explain the farm-nonfarm fertility differential is that the form of relationship between a compositional variable and fertility may be different for farm than for nonfarm populations. For instance, Duncan (1965) argued that the pattern of differential fertility in the nonfarm population was produced primarily by couples of farm origin, for whom a strong inverse relationship between education and fertility was found. The same education-fertility pattern was observed for couples currently residing on farms, but a greatly attenuated pattern was indicated for the indigenous nonfarm population. Since these relationships were not substantially altered when race, age, marital history, and labor force status of the wife were controlled, Duncan's findings invite the conclusion that farm-nonfarm differences in fertility might result primarily from differences in the form of the education-fertility relationship by residence. Support for the third type of effect of compositional variables, unlike that for the first two types, could enhance the possibility that cultural explanations must also be sought for farm-nonfarm differences in fertility, because the third type does not address why the form of compositional effect might be different for farm than for nonfarm fertility. Hypothesizing

differences by farm and nonfarm residence in the form of relationship between a compositional variable and fertility is equivalent to hypothesizing a residence-compositional factor interaction term. Inasmuch as the present study takes a broader spectrum of residence-compositional factor interactions into account, it represents an extension of Duncan's earlier work.

Cultural Factors

Drawing upon the earlier formulations of Wirth (1938), Fischer (1972, 1975a) hypothesized that urbanism should create a more articulated system of values and beliefs. Larger cities should have more socially diverse hinterlands from which to draw migrants. Thus, greater urbanism should be associated with greater subcultural variety. As a particular subcultural group becomes more concentrated in a city, a critical mass is attained enabling the group to achieve institutional completeness (e.g., a homosexual nightclub, a foreign-language newspaper, or a parochial school). These institutions become vehicles of communication or places for assemblage and thereby vitalize and intensify the norms and beliefs of the subculture. Although the concomitant strengthening of in-group cohesion will produce resistance to the adoption of alien norms and beliefs, some cultural diffusion is inevitable. The diffusion effects from the city to the hinterland are greatest for peripheral norms and beliefs and slowest for basic items. The mechanism for this relationship is specified by Willits and Bealer:

> . . . the nature of agriculture is such that it demands a high land-to-man ratio which has historically hindered the concentration of farmers into large communities and brought about a low density of population. . .This, in turn, limits the number of potential interacting partners and thus fewer social contacts per person are probable. Limited association leads to a strengthening of previously held values and is thus conducive to great fixity of habits and opinions - in a word, to greater conservatism (Willits and Bealer, 1963: 71).

As the population size and the nature of agriculture have unique implications for the generation of lifestyle, rural and urban populations are postulated to differ in subculture.

One of the lifestyle (cultural) differences that have been found between farm and nonfarm families concerns the relationship between men and women and the division of labor within the household. In both farms and nonfarm households, certain tasks must be performed in order for the family to continue to exist as a group: e.g., cooking meals, washing clothes, and paying bills. The cross-sex sharing of instrumental tasks within the household (stereotypically the "female" chores) has been hypothesized to be more characteristic of nonfarm than of farm residents (Goldberg, 1959). This hypothesis has been tested and supported with data from the 1954-1955 Detroit Area Study (Blood, 1958; Blood and Wolfe, 1960) and a Los Angeles study (Centers et al., 1971). Conjugal role relationships structured by household tasks thus appear to be more segregated on farms and more integrated in other places of residence. It would appear that the sentiments accompanying these instrumental relationships would specify a traditional sex-role ideology among farm residents and an egalitarian sex-role ideology among nonfarm residents.

This study conceives of ideology as being a commitment to a given set of values. As such, ideology is comprised of both norms and beliefs. Sex-differentiating norms obligate persons of a particular gender to perform certain tasks, or proscribe them from performing certain tasks, or accord them rights or privileges on the basis of gender (Holter, 1970). Norms thus specify how the desirable state of affairs should be attained. Sex-differentiating beliefs or values, on the other hand, constitute the justification for the sex-role norms. Holter enumerated three types of beliefs, the presence of at least one being necessary for the survival of sex-role differentiation in a social system: 1) beliefs in innate differences in mental or physical capacities or psychological states by sex; 2) beliefs in sex-role differentiation as reflective of natural or divine law; and 3) beliefs in the efficiency of sex-role differentiation. As a result, norms and beliefs constitute two conceptually different dimensions of sex-role ideology.

That farm populations hold distinctly different norms and beliefs about family life and appropriate behavior for women has been frequently documented. Farm populations are more likely to disapprove of women drinking in public places, more likely to assail premarital sex, less likely to approve of women wearing Bermuda shorts (in 1955), less likely to think that birth control should be available to everyone who wants it, more likely to favor an early age at marriage for both males and females, more likely to prefer large numbers of children, more likely to vote against a divorced political candidate, and more likely to disapprove the use of cosmetics (Glenn and Alston, 1967; Willits et al., 1974).

Respondents from smaller towns show greater intolerance than those from larger urban places with respect to nude photographs, nude actors, and topless waitresses, report a higher acceptable age for unchaperoned dates, and are more likely to feel the impropriety of kissing in public (Fischer, 1975b). It would appear that farm populations are more committed than nonfarm populations to a normative and a belief system prescribing familial roles and proscribing extrafamilial roles to women.

Sex-role ideology appears to have causal import for the size of family of procreation. The content of all other sex roles is predicted upon the sexual differentiation of childbearing and childrearing (Blake, 1972). Therefore, women who adhere more strongly to traditional sex-role ideologies should have larger families. Accordingly, Wrigley (1973) found sex-role egalitarianism to be the best single predictor of smaller family size preferences. Similarly, Scanzoni (1975) found that among highly educated or employed wives, sex-role egalitarianism was the strongest correlate of lower birth intentions. Comparisons of two white, never-married female university student samples drawn in 1971 and 1974 showed that not only did sex-role modernity correlate negatively with birth intentions but also that the relationship intensified over the three-year interval (Scanzoni, 1976a). A study of young married couples (wife aged 18-24) revealed that couple's role modernity was superior to both wife's education and wife's age at first marriage in predicting birth intentions (Scanzoni, 1976b). Hence, sex-role ideology appears to be an emerging explanatory factor for differential fertility.

The following hypotheses represent a summarization and extension of the theoretical and empirical relationships treated above.

H_1: Farm women are more traditional in sex-role ideology than nonfarm women.

H_2: The higher the sex-role traditionalism, the higher the actual fertility.

H_3: The higher farm than nonfarm fertility will be sustained after age at first marriage, education, marital instability, labor force participation, religion, race, and duration of marriage have been controlled.

H_4: The farm-nonfarm fertility differential will disappear after age at first marriage, education, marital instability, labor force participation, religion, race, duration of marriage, and sex-role ideology have been controlled.

Procedures

The data for this inquiry were the 1970 National Fertility Study (NFS II). The data were deemed unusually well suited to the analysis of farm-nonfarm differentials in childbearing for three reasons. First, NFS II was the first national fertility survey to include post-married women. Since marital disruption is more prevalent among nonfarm women, failure to include post-married respondents might yield spurious differences in the number of children born to farm as compared to nonfarm women. Second, the sample contained information on all compositional factors for each respondent. Third, NFS II contained eighteen questions regarding sex-role ideology, the first such inclusion in a national fertility survey. Therefore, the data afforded measures of both the cultural and the compositional variables hypothesized to render farm fertility different from the nonfarm.

The cross-sectional design of the data precluded comparisons of changes in the independent variables to changes in fertility. Consequently, the current status category was employed for both dependent and independent variables. The measure of fertility was the number of children ever born.

The compositional variables were scored in the following way. Residence was coded 0) farm and 1) nonfarm. Age at first marriage was measured in single years. Education was scored: 1) elementary, 1-8 years; 2) high school, 1-3 years; 3) high school, 4 years; 4) some college; 5) college, 4 or more years. Marital instability was coded as 0) first marriage unbroken and 1) first marriage broken. The work categories were 0) not working and 1) working. For current religious preference, Catholics were scored 0) and non-Catholics, 1). The race categories were 0) black and 1) white. Since blacks were double-sampled, it was necessary to proportionally weight the sample by the factors of 0.579 for currently married blacks and 0.432 for post-married blacks.

Since sex-role ideology was conceived to be multidimensional, it was necessary to construct an index of each dimension of sex-role ideology to operationalize a conceptually continuous ranking of respondents from conservative to egalitarian. The 18 sex-role items (Appendix A) were scored in the following manner: 1) strongly agree; 2) agree; 3) uncertain; 4) disagree; 5) strongly disagree. Item reversal for positively worded statements insured that the more egalitarian responses received higher scores.

A factor analysis of the 18 items was done with the principal components method of factoring. An oblique rotation of factors to simple structure was chosen to permit a more flexible patterning of relationships. As Cartwright (1965) has argued, an empirical test of the orthogonality of emergent dimensions is afforded rather than imposed by an oblique rotation. Kaiser's eigenvalue of 1.0 suggested at least two significant factors and Cattel's (1966) scree test yielded three. Those factor loadings in the rotated matrix (Appendix B) that were greater than or equal to 0.30 were deemed statistically significant. Since three of the rotated factors had item loadings meeting this criterion, three factors were chosen as most representative of patterned relationships in the data.

The empirical dimensions that emerged met theoretical expectations. One dimension, composed of six items, captured normative orientations regarding female rights of access to extrafamilial roles. A second dimension, consisting of five items, pertained to beliefs about the consequences to a woman and her family of procreation that such norms presuppose. As such, this belief dimension apparently represented orientations toward the efficiency in work performance by the family of procreation that may predicate a certain division of labor between the sexes. The third dimension, consisting of three items, appeared to tap beliefs regarding innate physiological, psychological, or mental capacities conditioned by gender.

Since the assumption of multiple causation of farm-nonfarm differences in fertility was made, a statistical procedure permitting the examination of unique variance in fertility explained by each predictor variable or by classes of predictor variables was needed. Therefore, linear regression was chosen for Hypothesis 1. Multiple regression was selected for Hypothesis 2, since three measures of sex-role ideology had been identified.

The decision was made to use hierarchical regression for Hypothesis 3 and 4. If sex-role ideology is a critical interpretive link between farm-nonfarm residence and fertility, it was imperative to show that the increment in variance explained by residence was significant after the variance accounted for by the compositional factors had been controlled. Since the principle of hierarchy states that the significance for an interaction term presupposes the significance of its lower-order relatives (Bishop et al., 1975), the order of inclusion levels for Hypothesis 3 became: 1) the seven compositional variables, 2) their 21 two-way interaction terms; 3) the residence factor; and 4) the seven two-way interactions between residence and the compositional factors. For Hypothesis 4, the first two inclusion levels remained the same as for Hypothesis 3. The remaining levels were: 3) the three sex-role variables; 4) the residence factor; 5) the seven interactions between residence and the compositional factors. The significance of the incremental variance in children ever born explained by a factor or a level of factors was tested by an F ratio (Kerlinger and Pedhazur, 1973; Namboodiri et al., 1975).

Findings

The linear regressions of the three measures of sex-role ideology upon residence (Hypothesis 1) are displayed in Table 1. The simple correlation coefficients and standardized regression coefficients showed residence to be most strongly related to norms about females' rights of access to extrafamilial roles. The measures of association further indicated that residence was about equally well related to the belief scale about women's rights to extrafamilial roles and to the measure of beliefs about inborn differences between persons attributable to gender. Although the magnitudes of these relationships were weak (β = 0.08, 0.06, and 0.05, respectively), in each case the F ratio was statistically significant.

[Table 1 about here]

Although the relationship between sex-role ideology and residence was statistically significant, the small magnitude of the relationship reduced the likelihood that it would serve as a major interpretive link in the residence-fertility relationship. Nonetheless, the possibility existed that when the relationships between fertility and the compositional variables were controlled in a multivariate framework, the effect of sex-role ideology upon the residence-fertility relationship might be enhanced.

If sex-role ideology is to be an important interpretive link between farm-nonfarm residence and fertility, a demonstration of the relationship between sex-role ideology and fertility is also necessary. Therefore, Hypothesis 2 posited that greater sex-role traditionalism would be predictive of higher fertility.

Since no intrinsic causal ordering among the three sex-role measures was hypothesized, a standard multiple regression of children ever born upon these three facets of sex-role ideology was employed (Table 2). The F ratios showed that the increment to the regression sum of squares owing to the addition of the variable when the other variables were in the equation was in every case significant at $\alpha = 0.01$. In addition, the relative magnitudes of the standardized regression coefficients indicated that the belief dimension regarding supposed innate differences between persons because of gender ($\beta = -0.18$) was more strongly related to fertility than was the normative dimension or the belief dimension about women's rights to extrafamilial roles ($\beta = -0.04$ in both of the latter cases). Therefore, Hypothesis 2 was supported.

[Table 2 about here]

Although statistical significance was found for all sex-role measures in the test of Hypothesis 2, the weak magnitudes of the correlation coefficients and the standardized regression coefficients for the association between fertility and the normative and belief dimensions about women's rights to extrafamilial roles suggested that these two measures of sex-role ideology would not serve as important interpretive links between residence and children ever born once the effects of the seven compositional variables had been partialled out of these measures of sex-role ideology. The size of the regression coefficient for the factor of beliefs ascribing differences on the basis of gender did suggest, however, that traditionalism for this aspect of sex-role

ideology was associated with larger family sizes. Yet since the normative dimension was most closely linked with farm-nonfarm residence, these findings implied that at least one dimension of sex-role ideology was an important predictor of fertility but that sex-role ideology was not a key interpretive variable for the residence-fertility relationship.

The overall goodness of fit test for the total variance explained by the regression model of Hypothesis 3 yielded a statistically significant F ratio ($F=94.57$, $p < 0.01$) (Table 3). Being over one-third of the total variance in y, the explained variance was quite large in magnitude, as well. The variance explained by the seven compositional factors was statistically significant ($F=448.19$, $p < 0.01$). Furthermore, the 21 two-way interaction terms involving these compositional factors provided an increment to explained variance that was significantly different from zero ($F=7.80$, $p < 0.01$). Of special relevance to Hypothesis 3 is that even when the effects of the compositional variables and the concomitant interactions had first been removed from residence, the increment to explained variance provided by residence was statistically significant ($F=11.38$, $p < 0.01$).[1] Finally, the seven two-way interaction terms involving residence with a compositional variable did not produce a statistically significant increment to explained variance in children

---

[1]The variance due to the seven compositional factors and their associated 21 two-way interactions was removed from residence but not from fertility. The resultant squared semipartial correlation

ever born ($F=1.36$, $p < 0.05$) once the compositional variables, the two-way interactions among the compositional variables, and the residence term has been controlled. Therefore, the arguments that the main or interactive effects of the compositional variables account for the residential difference in fertility were not supported (Slesinger, 1974; Bumpass, 1969). It can also be concluded that the importance of residence for fertility was not explained by a change in the form of relationship between the compositional variables and fertility across farm and nonfarm populations.

[Table 3 about here]

Unfortunately, the introduction of the 28 two-way interaction terms into the regression equation produced multicollinearity, since each multiplicative term was highly correlated with at least one of its main effects. According to Althauser (1971), the effect of multicollinearity, depending upon the size of sample means for a given x_1 and x_2, is deflation or (in rarer cases) inflation of the regression coefficients for the main effects. To circumvent the problem, it was decided to eliminate all the multiplicative terms from the regression equation. This decision was prompted by three considerations.

($r^2_{y(29.12...28)}$) represented the proportional increment to explained variance in fertility accounted for by residence after the seven compositional factors and the 21 interactions had been controlled. The F ratio tested the statistical significance of this semipartial correlation. By contrast, the squared partial correlation between residence and fertility ($r^2_{y29.12...28}$) would have been obtained had the variance due to the compositional factors and the 21 interactions been removed not only from residence but also from fertility. As such, the squared partial correlation would have represented the proportional decrement to unexplained variance in fertility caused by the introduction of residence after the first 28 variables had been controlled.

First, the seven multiplicative terms representing the residence-composition interactions did not attain statistical significance. Consequently, the variance in fertility could be adequately explained by the reduced model of three inclusion levels (R^2 = 36.4 percent). Secondly, the 21 interaction terms representing the second inclusion level explained only 1.8 percent additional variance over that explained by the seven compositional variables alone (R^2 = 34.5 percent). For this reason, deleting the 21 terms would achieve parsimony without large sacrifice of variance explained. Thirdly, the purpose of including the interaction terms as the second and fourth levels in the hierarchical regression was to ascertain whether the effect of residence upon fertility could thereby be made to disappear. Since the effect of residence did not vanish, subsequent elimination of the interaction would not prejudice the conclusion that Hypothesis 3 was supported.

The regression coefficients for Hypothesis 3 (Table 4) were not biased by multicollinearity in the new model, for the largest correlation among independent variables was 0.37 between education and age at first marriage. Duration of marriage was the most strongly related to fertility of the eight predictor variables (β = 0.50). It was also found that whites had fewer children than blacks, the standardized beta for race was -0.14. Current work (β = -0.13) and current religious preference (β = -0.12) were about equally well related to fertility: working women and women professing non-Catholic faiths had fewer children than women not working or women stating a preference for Catholicism. Age at first marriage (β = -0.08) and education

($\beta = -0.08$) were inversely related to fertility, as well. Each of these variables was statistically significant. The findings for the relationships between these six compositional variables and fertility corroborate results from an earlier analysis of these data (Westoff and Ryder, 1977).

[Table 4 about here]

The only unexpected finding for the compositional variables was that instability of first marriages ($\beta = 0.06$) was associated with larger rather than smaller numbers of children. Bogue's (1969) report of an inverse association between marital disruption and fertility was based upon an aggregate-level tabular analysis of the 1960 Census with the use of three control factors (race, age, and residence of women). The difference in findings between Bogue's analysis and the current study may have thus resulted either from differences in data or differences in structural models. In addition, the Freedman et al. (1959b) report was based upon a sample of currently married women. Hence, their findings of an inverse association between marital disruption and fertility may have been biased by the selective reentry to the currently married status category of post-married women having small numbers of children. As Table 4 shows, the positive regression coefficient for instability attained statistical significance ($F=27.9$, $p < 0.01$).

After the seven compositional variables were in the regression equation, the addition of residence yielded an increment of 0.00114 to explained variance, which was statistically significant ($F=10.38$, $p < 0.01$).

Although the magnitude of the standardized beta for residence ($\beta = -0.03$) was the smallest of the eight regression weights, support of Hypothesis 3 confirmed that residualizing residence upon the seven compositional variables did not cause the relationship between residence and fertility to vanish.

In the hierarchical regression for Hypothesis 4, the overall goodness of fit test yielded an F of 88.97, which was statistically significant (Table 5). The structural model for Hypothesis 4 explained 37 percent of the variance. Since the first two inclusion levels (the seven compositional variables and the associated two-way interaction terms, respectively) remained the same as for Hypothesis 3, the F ratios testing the incremental variance explained by each of these two sets of predictors were unchanged. The third level of inclusion was the three measures of sex-role ideology, which became the 29th, 30th, and 31st predictor variables in the regression. After the amount of variance explained by the first 28 variables had been removed from the normative measure regarding extrafamilial female roles, the increment in variance explained for fertility wholly by this factor of sex-role ideology was not significantly different from zero ($F=2.52$, $p > 0.05$). Similarly, the additional variance explained by the belief dimension pertaining to extrafamilial female roles was not significant ($F=0$, $p > 0.05$) after the first 29 variables had been introduced into the regression. A different picture was obtained for the measure of beliefs about innate differences between persons that can be ascribed to gender. Even after the latter sex-role measure

had been residualized on the first 30 variables, its contribution to R^2 was statistically significant ($F=41.64$, $p < 0.01$). These outcomes are consistent with the findings for Hypothesis 2, where the magnitudes of the standardized regression weights suggested that only the latter measure of sex-role ideology would remain an important predictor of fertility, ceteris paribus.

[Table 5 about here]

The fourth level of inclusion (32nd independent variable) in the hierarchical regression was residence. After the amount of variance uniquely explained by the seven compositional variables, their associated interaction terms, and the three sex-role measures had been removed from residence, the latter factor still contributed a significant increment to R^2, ($F=9.96$, $p < 0.01$). Since the addition of the sex-role measures to the regression equation did not cause the farm-nonfarm differential in fertility to vanish, Hypothesis 4 was not supported.

Because the presence of multicollinearity in the hierarchical regression for Hypothesis 4 obviated a comparison of regression weights for the sex-role measures to weights for the other main effects, it was decided to eliminate the interaction terms from the analysis. Multicollinearity was thereby removed, for the largest intercorrelation among the remaining predictor variables was 0.37 (for age at first marriage and education). Three stages of inclusion were observed when the regression was repeated: 1) the seven compositional variables; 2) the three sex-role measures; and 3) residence (Table 6). A comparison of Tables 4 and 6 reveals that the magnitudes of the standardized regression

weights changed only slightly. Duration of marriage remained the best single predictor of children ever born. It is also notable that beliefs about innate gender differences was as good a predictor of children ever born as were marital instability, education, and age at first marriage taken separately.

[Table 6 about here]

Residence had the smallest statistically significant regression weight. Two interpretations of this finding are possible. One is that residence has a negligible effect on fertility. A second interpretation is that given the very uneven division of the sample between farm and nonfarm categories (6 percent and 94 percent, respectively), the small magnitude of the regression coefficient underestimates the effect of residence. The fact that residence continued to exhibit a statistically significant effect despite the large number of predictor variables and the extremely unbalanced sample division lends support to the second interpretation.

Conclusions

The findings of this study point to several profitable areas for future research. One finding was the negative association between fertility and beliefs in differences among persons ascribable to gender. Therefore, one profitable area for future study is the bases of beliefs in ascriptive differences between males and females. Beliefs that gender implies biological, psychological, and mental limitations upon persons may arise from

several sources. One such source, unexplored in the present study, is a conviction that such differences are instituted by natural or divine law.

There are some bases for concluding that farm populations are more fundamental in religious beliefs than the nonfarm. Farm populations have been found more likely to believe in the existence of a heaven, a hell, and a devil, more likely to believe in the divinity of Christ, and more disapproving of religious exogamy and Sabbath labor (Glenn and Alston, 1967; Glenn and Hill, 1977; Willits et al., 1974). As a result, future study could profitably explore the religious bases of sex-role norms and beliefs and their relationship to farm-nonfarm differences in fertility.

Previous studies have found aspects of social conservatism to vary inversely with size of place and directly with distance from an urban center (Glenn and Hill, 1977; Willits et al., 1973 and 1974). Therefore, a second area for future research would be to seek whether a gradient pattern might exist for dimensions of sex-role ideology. If such a gradient pattern is found, then the rural nonfarm population would be more conservative with respect to sex-role norms and beliefs than the urban population. As such, the combination of these two subgroups of the nonfarm population in the present study may account for the failure of sex-role ideology to explain residential differences in fertility.

A third direction for futufe research is the further exploration of rural-urban differences in fertility. The present study focused upon one segment of the rural population: farm residents. Since rural nonfarm

women have higher fertility than urban women (U.S. Bureau of the Census, 1973a), the heterogeneity of the nonfarm population may have understated the magnitude of the residence-fertility relationship reported here.

Beale (1975) recently documented the reversal between 1970-1973 of the nonmetropolitan to metropolitan net migration flow that has characterized the exchange of rural and urban populations. This reversal was accompanied by a widening of the nonmetropolitan-metropolitan differential in fertility (Beale, 1975). Another recent study found that the gap between rural and urban fertility was wider for those under 25 years of age than for those older (Rindfuss and Sweet, 1975). These findings do not suggest a convergence of the rural-urban fertility gap.

Finally, Zelinsky (1971) has argued that a characteristic of post-transitional societies is the emergence of noneconomic motivations for migration. He further speculated that such motivations would play an even larger part in decisions to move. If noneconomic motives do come to dominate migration decisions in post-transitional societies, then fertility decisions a fortiori should be based on noneconomic factors. Consequently, to the extent that the new metropolitan-to-nonmetropolitan migration trend is selective of persons seeking family-intensive lifestyles and valuing traditional sex-roles, the rural-urban fertility differential may be expected to continue. Future studies relating migration and fertility can reveal the extent to which, in a post-industrial society, these demographic processes are responsive to lifestyles and ideologies specialized by residence.

REFERENCES

Aalen, F.H.A.
1963 "A review of recent Irish population trends." Population Studies 17:73-78.

Abu-Lughod, Janet
1964 "Urban-rural differences as a function of the demographic transition." American Journal of Sociology 69:476-490.

Althauser, R.P.
1971 "Multicollinearity and nonadditive regression models." Pp. 453-472 in Hubert M. Blalock, Jr. (ed.), Causal Models in the Social Sciences. Chicago: Aldine-Atherton.

Beale, Calvin L.
1975 The Revival of Population Growth in Nonmetropolitan America. Washington, D.C.: Economic Development Division, Economic Research Service, U.S. Department of Agriculture.

Beegle, J. Allan
1966 "Social structure and changing fertility of the farm population." Rural Sociology 31:415-427.

Bishop, Yvonne M., Stephen E. Fienberg and Paul W. Holland
1975 Discrete Multivariate Analysis: Theory and Practice. Cambridge: The MIT Press.

Blake, Judith
1972 "Coercive pronatalism and American population policy." Pp. 85-109 in Charles F. Westoff and Robert Parke, Jr. (eds.), Aspects of Population Growth Policy. Volume VI of Commission on Population Growth and the American Future research reports. Washington, D.C.: Government Printing Office.

Blood, Robert O., Jr.
1958 "The division of labor in city and farm families." Marriage and Family Living 20:170-174.

_____ and Donald M. Wolfe
1960 Husbands and Wives. New York: The Free Press.

Bogue, Donald J.
1969 Principles of Demography. New York: John Wiley & Sons, Inc.

Brunner, E. de S., and J.H. Kolb
1933 Rural Social Trends. New York: McGraw-Hill.

Bumpass, Larry
1969 "Age of marriage as a variable in socio-economic differentials in fertility." Demography 6:45-54.

Bumpass, Larry, and James A. Sweet
1972 Differentials in marital instability: 1970. American Sociological Review 37:754-766.

Cartwright, Desmond S.
1965 "A misapplication of factor analysis." American Sociological Review 30:249-251.

Cattel, R.B.
1966 Handbook of Multivariate Experimental Psychology. Chicago: Rand McNally.

Centers, Richard, Bertram H. Raven, and Aroldo Rodrigues
1971 "Conjugal power structure: a re-examination." American Sociological Review 36:264-278.

Duncan, O.D., and A.J. Reiss, Jr.
1956 Social Characteristics of Urban and Rural Communities. New York: John Wiley.

1950 "Fertility of the village population in Pennsylvania, 1940." Social Forces 28:304-309.

1965 "Farm background and differential fertility." Demography 2: 240-249.

Fischer, Claude S.
1972 "Urbanism as a way of life: a review and an agenda." Sociological Methods and Research 1:187-242.

1973a "On urban alienations and anomie: powerlessness and social isolation." American Sociological Review 38:311-326.

1973b "Urban malaise." Social Forces 52:221-235.

1975a "Toward a subcultural theory of urbanism." American Journal of Sociology 80:1319-1341.

1975b "The effect of urban life on traditional values." Social Forces 53:420-432.

Freedman, Ronald, Gerhard Baumert, and Martin Bolte
1959a "Expected family size and family size values in West Germany." Population Studies 13:136-150.

_____, and Doris P. Slesinger
1961 "Fertility differentials for the indigenous non-farm population of the United States." Population Studies 15:161-173.

_____, Pascal K. Whelpton, and Arthur A. Campbell
1959b Family Planning, Sterility and Population Growth. New York: McGraw-Hill Book Company.

Glass, D.V.
1968 "Fertility trends in Europe since the Second World War." Population Studies 22:103-146.

Glenn, Norval D., and Jon P. Alston
1967 "Rural-urban differences in reported attitudes and behavior." Southwestern Social Science Quarterly 47:381-400.

_____, and Lester Hill, Jr.
1977 "Rural-urban differences in attitudes and behavior in the United States." The Annals of the American Academy of Political and Social Science 429:36-50.

Goldberg, David
1959 "The fertility of two-generation urbanites." Population Studies 12:214-222.

1960 "Another look at the Indianapolis fertility data." Milbank Memorial Fund Quarterly 38:23-36.

Holter, Harriet
1970 Sex Roles and Social Structure, Oslo: Universitetforlaget.

Rice, Rodger R., and J. Allan Beegle
1972 Differential Fertility in a Metropolitan Society. Morgantown: West Virginia University, Rural Sociological Society. Monograph Series, Number 1.

Rindfuss, Ronald R., and James A. Sweet
1975 "Rural fertility trends and differentials." Family Planning Perspectives 7:264-269.

Ritchey, P. Neal
1973 "Effects of marital status on the fertility of rural-urban and urban-rural migrants." Rural Sociology 38:26-35.

Scanzoni, John H.
1975 Sex Roles, Life Styles, and Childbearing. New York: The Free Press.

1976a "Sex role change and influences on birth intentions." Journal of Marriage and the Family 38:43-58.

1976b "Gender roles and the process of fertility control." Journal of Marriage and the Family 38:677-691.

Slesinger, Doris P.
1974 "The relationship of fertility to measures of metropolitan dominance: a new look." Rural Sociology 39:350-361.

Sydenstricker, Edgar S., and Frank W. Notestein
1930 "Differential fertility according to social class." Journal of the American Statistical Association 25:9-32.

Tarver, James D.
1969 "Gradients of urban influence on the educational, employment, and fertility patterns of women." Rural Sociology 34:356-367.

_____, Cathy Cyrus, Kenneth Kiser, Che-Fu Lee, and Robert Moran
1970 "Urban influence on the fertility and employment patterns of women living in homogeneous areas." Journal of Marriage and the Family 32:237-241.

Thompson, W.S., and N.E. Jackson
1940 "Fertility in rural areas in relation to their distance from cities, 1930." Rural Sociology 5:143-162.

U.S. Bureau of the Census
1972 Census of Population: 1970. General Social and Economic Characteristics. Final Report PC(1)-C 1, United States Summary. Washington, D.C.: U.S. Government Printing Office.

1973a Census of Population: 1970, Subject Report. Age at First Marriage. Final Report PC(2)-4D. Washington, D.C.: U.S. Government Printing Office.

1973b Census of Population: 1970, Detailed Characteristics. Final Report PC(1)-D1. Washington, D.C.: U.S. Government Printing Office.

Westoff, Charles F., and Norman B. Ryder
1977 The Contraceptive Revolution. Princeton: Princeton University Press.

Whelpton, Pascal K., Arthur Campbell, and John E. Patterson
1966 Fertility and Family Planning in the United States. Princeton: Princeton University Press.

Willits, Fern K., and Robert C. Bealer
1963 "The utility of residence for differentiating social conservation in rural youth." Rural Sociology 28:70-80.

_____, _____, and Donald M. Crider
1973 "Leveling of attitudes in mass society: rurality and traditional morality in America." Rural Sociology 38:36-45.

1974 "The ecology of social traditionalism in a rural hinterland." Rural Sociology 39:334-347.

Wirth, Louis
1938 "Urbanism as a way of life." American Journal of Sociology 44:1-24.

Wrigley, Alice P.
1973 The Effects of Sex-Role Ideology on Family Size Preferences. Athens: University of Georgia, unpublished Master's thesis.

Zelinsky, Wilbur
1971 "The hypothesis of the mobility transition." American Geographical Review 61:219-249.

Table 1. Regressions of Three Measures of Sex-Role Ideology Upon Residence.[a]

Dependent Variable	Independent Variable	Simple r	R^2	b	Beta	F	Intercept
Norms about women's rights to extrafamilial roles	Residence	0.08	0.00621	1.15	0.08	37.87[b]	19.22
Beliefs about women's rights to extrafamilial roles	Residence	0.06	0.00310	0.89	0.06	18.82[b]	12.71
Beliefs about innate differences between persons implied by gender	Residence	0.05	0.00225	0.41	0.05	13.64[b]	10.12

[a] Weighted N=6,059

[b] $p<0.01$

Table 2. Standard Multiple Regression of Births Upon Three Measures of Sex-Role Ideology[a]

Independent Variables	Simple r	R^2	b	Beta	F	Intercept
Norms about women's rights to extrafamilial roles	-0.07	0.00527	-0.02	-0.04	11.16[b]	
Beliefs about women's rights to extrafamilial roles	-0.10	0.01168	-0.02	-0.04	7.29[b]	
Beliefs about innate differences between persons implied by gender	-0.20	0.04297	-0.16	-0.18	198.02[b]	4.79

[a]Weighted N=6,059

[b]$p<0.01$

Table 3. Summary of Hierarchical Regression of Children Ever Born Upon Compositional Factors, Compositional Interactions, Residence, and Compositional-Residence Interactions[a]

Independent Variables	R^2 (Cumulative)	F_{HR}[b]
Compositional factors	0.34494	448.19[c]
Compositional interactions	.36253	7.80[c]
Residence	.36375	11.38[c]
Compositional-residence interactions	0.36477	1.36

[a]Weighted N=5,966. Intercept = 3.87. The overall goodness of fit, calculated by F_{HR}, yields 94.57, which at 36 and 5,929 degrees of freedom is significant for $p<0.01$.

[b]Hierarchical regression approach:

$F = \frac{(R_F^2 - R_R^2)/(k_F - k_R)}{(1 - R_F^2)/(N - k_F - 1)}$. F tests the significance of increments to R^2 gained by adding ordered variables R + 1 through F.

[c]$p<0.01$.

Table 4. Hierarchical Regression of Births Upon Compositional Variables and Residence[a].

Independent Variables	Simple r	R^2	b	Beta	F_{SR}	F_{HR}
Race	-0.15	0.02130	-0.87	-0.14	172.88[b]	
Duration of marriage	0.52	0.29296	0.01	0.50	2154.28[b]	
Marital instability	0.11	0.29654	0.27	0.06	27.94[b]	
Education	-0.24	0.31188	-0.14	-0.08	44.11[b]	
Work	-0.09	0.32933	-0.47	-0.13	140.41[b]	
Faith	-0.07	0.33983	-0.51	-0.12	117.92[b]	
Age at first marriage	-0.20	0.34494	-0.05	-0.08	45.18[b]	$F_{1-7} = 448.19^b$
Residence	-0.08	0.34607	-0.26	-0.03	10.35[b]	$F_8 = 10.38^b$

[a]Weighted N=5,966; Intercept=3.85. The overall goodness of fit, calculated by F_{HR}, yields 394.07, which at 8 and 5957 degrees of freedom is significant at $p < 0.01$.

[b]$p < 0.01$

Table 5. Summary of Hierarchical Regression of Children Ever Born Upon Compositional Factors, Compositional Interactions, Sex-Role Measures, Residence, and Compositional-Residence Interactions[a]

Independent Variables	R^2 (Cumulative)	F_{HR}
Compositional factors	0.34494	448.19[b]
Compositional interactions	.36253	7.80[b]
Norms re extrafamilial roles	.36280	2.52
Beliefs re extrafamilial roles	.36280	0
Beliefs re innate differences	.36723	41.64[b]
Residence	.36829	9.96[b]
Compositional-residence interactions	0.36929	1.34

[a] Weighted N=5,966; Intercept = 4.50. The overall goodness of fit yields F = 88.97, which at 39 and 5,926 degrees of freedom is significant for $p<0.01$.

[b] $p<0.01$.

Table 6. Hierarchical Regression of Births Upon Compositional Variables, Sex-Role Measures, and Residence[a]

Independent Variables	Simple r	R^2	b	Beta	F_{SR}	F_{HR}
Race	-0.15	0.02130	-0.83	-0.13	152.60[b]	
Marital Instability	0.11	0.02915	0.26	0.06	25.62[b]	
Education	-0.24	0.07422	-0.10	-0.06	21.34[b]	
Work	-0.09	0.08217	-0.48	-0.13	138.77[b]	
Faith	-0.07	0.08824	-0.50	-0.12	115.00[b]	
Age at first marriage	-0.20	0.10485	-0.05	-0.08	48.00[b]	
Duration of marriage	0.52	0.34494	0.01	0.49	2079.01[b]	$F_{1-7} = 448.19^b$
Norms about extra-familial roles	-0.08	0.34516	-0.01	-0.01	1.15	$F_8 = 2.00$
Beliefs about extra-familial roles	-0.09	0.34516	0.01	0.01	1.55	$F_9 = 0.00$
Beliefs about innate differences	-0.20	0.34983	-0.06	-0.07	41.86[b]	$F_{10} = 42.77^b$
Residence	-0.08	0.35081	-0.24	-0.03	9.00[b]	$F_{11} = 8.99^b$

$F_{8-10} = 14.93^b$

[a] Weighted N=5,966; Intercept=4.45. The F ratio for overall goodness of fit = 292.50, which at 11 and 5,954 degrees of freedom is significant for $p < 0.01$.

[b] $p < 0.01$

Appendix A

SEX-ROLE DIMENSIONS

Dimension 1

A woman should have exactly the same job opportunities as a man.

On the job, men should not refuse to work under women.

Young girls are entitled to as much independence as young boys.

Men and women should be paid the same money if they do the same work.

Women should be considered as seriously as men for jobs as executives or politicians or even President.

There should be free child care centers so that women could take jobs.

A pre-school child is likely to suffer if his mother works.

A working mother can establish as warm and secure a relationship with her children as a mother who does not work.

It is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family.

Women are much happier if they stay at home and take care of their children.

If anything happened to one of the children while the mother was working, she could never forgive herself.

A man can make long-range plans for his life, but a woman has to take things as they come.

You usually find the happiest families are those with a large number of children.

Sex seems to exist mainly for the man's pleasure.

Appendix B

FACTOR ANALYSIS FOR SEX-ROLE IDEOLOGY

Table 7. Rotated Factor (Pattern) Loadings.

Items[a]	Factor 1	Factor 2	Factor 3	Factor 4
VAR001	0.12	0.00	0.34	0.01
VAR002	.87	- .27	- .03	.10
VAR003	.74	- .10	.07	.13
VAR004	.62	- .02	.05	- .20
VAR005	- .16	.75	.03	- .02
VAR006	.14	.28	- .13	- .01
VAR007	.29	.24	- .02	.02
VAR008	- .04	.38	.06	.02
VAR009	.45	.11	.22	- .23
VAR010	.00	.33	- .03	- .09
VAR011	- .16	.54	.10	.16
VAR012	- .07	.65	- .06	- .13
VAR013	.46	- .03	.29	- .06
VAR014	.11	.24	- .24	.16
VAR015	.12	.12	.32	- .13
VAR016	.14	.13	- .05	- .08
VAR017	.04	.31	- .29	.11
VAR018	0.02	0.04	0.54	0.16

[a]See Appendix A.