Using data on 4,667 women from the 1976–77 Iran Fertility Survey, we examine the trend and social correlates of consanguineous marriage in Iran. Based upon William Goode’s theory of modernization, we hypothesize a declining trend in consanguineous marriage over time and negative relationships between consanguinity and measures of social status. Contrary to our expectations, there was a modest increase in the proportion of marriages between cousins in Iran from the 1940s to 1970s. Results from multivariate logistic regressions, however, indicate that many of the measures of individual social status had the expected negative relationships with consanguinity. Overall, the results of this analysis suggest that forces of modernization may be slowly eroding the social bases of consanguinity, while the increased availability of cousins may lead to an increase in consanguinity in the near term.

The 20th century, especially since World War II, has witnessed a transformation of social and economic life in countries around the world. These changes, loosely linked under the rubric of modernization, are hypothesized to have a very strong impact on patterns of marriage and family life. Three decades ago, William Goode (1963) presented an encompassing theory of the impact of industrialization, and modernization more generally, on family structure and conjugal relationships. His basic idea is that the nuclear family, and a set of associated attributes, are more adapted to the high levels of geographic and social mobility of industrial society than are traditional family structures.

While Goode’s thesis has been frequently challenged, there is really no alternative theory of family change in the modern world. Moreover, many of the hypotheses that were explicit or implicit in Goode’s theoretical formulation have found empirical support (Lee, 1987; Thornton & Fricke, 1987). In particular, there is widespread evidence in many developing countries of trends toward later age at marriage and more autonomy in the choice of marital partners (Durch, 1980; Rindfuss & Morgan, 1983). One of the less discussed aspects of Goode’s theory was consanguinity—the marriage between cousins or other close relatives. As with other aspects of traditional marriage patterns, Goode hypothesized a decline in consanguinity with modernization. In this article, we examine the trend and social correlates of consanguinity in Iran with retrospective data from the Iran Fertility Survey (IFS), a national fertility survey conducted in 1977.

DEFINING CONSANGUINITY

Consanguineous marriage appears as an esoteric topic in research on marriage and kinship in West-
ern nations, but it is a central feature of family systems in many parts of the world. A consanguineous marriage is one in which the two partners have at least one ancestor in common, with the ancestor being no more distant than a great-great grandparent (Hafez et al., 1983). For descendants who are of the same generation, a consanguineous marriage would be between one person and a third cousin or a closer relative. Consanguineous marriages are relatively common in many areas of the world, including most countries in the Middle East and South Asia, some countries in sub-Saharan Africa, and (possibly) China (Bittles, Mason, Greene, & Rao, 1991). Because national surveys of family and fertility rarely inquire whether spouses were related prior to marriage, precise knowledge of the prevalence of consanguinity is generally unavailable, but estimates of consanguinity from one-quarter to one-third of all marriages are common in many countries.

The practice of consanguineous marriage is generally considered to be an important issue in anthropological studies of family and kinship systems (Goody, 1976; Holy, 1989; Levi-Strauss, 1969; Murdock, 1949). A marriage between cousins helps to conserve heritable assets within the extended family and also minimizes the risk of incompatibility between marriage partners and families. While less studied in contemporary sociology, the question of consanguinity is relevant to many aspects of comparative sociological theories of family systems. The persistence of cousin marriage and cultural preferences for marriage between cousins in many modernizing societies raises questions about the impact of modernization on family structure. Perhaps the division between traditional family forms and Goode's modern "conjugal family" may not be as clear-cut as once thought. The institution of consanguineous marriage is linked to many other aspects of family life, including the choice of marriage partner, marital relations, and nepotistic behavior within the kin network. Empirical evidence on these issues is modest, and the sociological implications of consanguinity are rarely incorporated into discussions and interpretations of comparative marriage and family systems.

**Modernization and Consanguineous Marriage**

Goode (1963) presented a clear statement of the impact of modernization on the incidence of consanguineous marriage as a consequence of the decline of the institution of arranged marriage. Goode reasoned that in the Middle East, sub-Saharan Africa, India, and China, the incidence of cousin marriage should decrease as individuals begin to enjoy greater freedom in the process of mate selection. In modernizing societies, individuals are no longer restricted to the choices offered by an arranged marriage. Goode summarizes his argument as follows: "It can be predicted that any movement toward a conjugal family and freedom of courtship is likely to reduce the percentage of marriages between close relatives. The range of possible eligibles becomes much wider, and freer social intercourse reduces the simple statistical chance that a given individual will fall in love with and marry a close relative" (1963, pp. 218-219).

The incidence of consanguineous marriage should decrease as modernization progresses and an increasing number of individuals begin to freely choose their mates from a broader pool of potential marriage partners. In his description of changing family systems in the Middle East, Goode observed that arranged marriage and the associated system of paying a brideprice will disappear as the more educated groups begin to adopt Western norms about freedom of mate choice. He also suggested that women with more education and labor force participation will demand more freedom in the process of choosing a marriage partner. For Goode, then, the first individuals to abandon arranged marriage will generally be individuals with high social status—highly educated men and women in the labor force.

The logic of Goode's theory leads to clear empirical expectations as modernization spreads and an increasing number of individuals achieve higher social status (more education, modern occupational roles, etc.). Individuals with higher social status will desire more freedom from traditional society and will tend to marry later in life and have fewer arranged marriages. As fewer individuals have arranged marriages, the theoretical expectation is that the overall incidence of consanguinity should decrease.

Several empirical studies have investigated the social correlates of consanguinity in the Middle East and South Asia and have reported findings that confirm Goode's thesis. Rao and Inbaraj (1977), in a study of a district in Tamil Nadu, South India, found that urban women and men in high-status occupations were less likely to have consanguineous marriages than other women and
men. Venugopal Rao and Murty (1984) found negative relationships between the incidence of consanguinity and both urban residence and socioeconomic status in the state of Andhra Pradesh in South India. In a study of consanguineous marriage in Saudi Arabia, Saedi-Wong, Al-Frayh, and Wong (1989) reported that men and women in Riyadh with more education were less likely to marry their relatives than were persons with less education. In a sample of households in Beirut, Khat (1988) found that husband's occupational status had a negative relationship with consanguinity.

**Consanguineous Marriage in Iran**

Historical sources indicate that marriage between close relatives has been traditionally practiced in Iran (Slotkin, 1949). Several anthropological accounts report a strong Iranian preference for marriage to first cousins. While Iranians observe the prohibitions against close relative marriage mentioned in the Koran (e.g., a man's mother, daughters, sisters, aunts, nieces, and some of his wife's relatives), a man is allowed to marry any of his parallel or cross-cousins (Spooner, 1965; Tapper & Tapper, 1988). Unlike many other populations in the Middle East, Iranians state no specific preference for a man marrying his father's brother's daughter (Tapper & Tapper, 1988). A general "bilateral" preference for marriage with close kin has been observed in many regions of Iran (Barth, 1961; Bradburd, 1984; Spooner, 1965; Tapper, 1979).

Although based on very small samples, several ethnographic studies have reported the incidence of consanguineous marriage among Iranian communities. Bradburd (1984) found that 37% of 108 marriages among the Komachi nomads were consanguineous, with 29% of those marriages being with first cousins. Tapper (1979) found that 27% of 89 marriages among the Shahsevan nomads were with first cousins, with an additional 31% of all marriages being with distant agnates. Fischer (1978) found that 29% of the 381 marriages he investigated in the city of Yazd were consanguineous, with 24% of all marriages being with first cousins.

Other studies of consanguineous marriage in Iran have been based on larger samples. Naderi (1979), in a study of over 9,500 pregnancies in the city of Shiraz, found that 24.5% of the births in his sample came from consanguineous unions. Behnam and Amani (1974), citing figures from the 1966 census of Iran, reported that the incidence of consanguineous marriage ranged from 25.1% in Tehran to 32.8% in some rural areas. Neither of these studies were able to examine relationships between socioeconomic characteristics and consanguinity.

**Modernization in Iran**

The development of the petroleum economy in Iran led to a tremendous expansion of state revenues during the 1950s, 1960s, and 1970s—the era of the so-called “white revolution” or revolution from above. While much of the new wealth generated by the rapid economic growth during this period went to unproductive uses, there was also a very substantial expansion of educational and new occupational opportunities (see the time series statistics for Iran in Mitchell, 1982).

To provide a basic description of social change and modernization in Iran in the decades leading up to the late 1970s, Table 1 shows the distributions of educational attainment and other background characteristics for several birth cohorts of Iranian men and women. These data are drawn from the 1976–77 Iranian Fertility Survey (IFS), the data source used in the subsequent analysis of consanguinity. The IFS samples of women and men in these age groups (20–29, 30–39, and 40–49 in 1977), however, are not fully representative of successive birth cohorts in the Iranian population. The IFS sample included only married women and their husbands. Furthermore, in order to keep consistency with the subsequent analysis, we have restricted the sample to women who were married only once. However, the distributions based on the total IFS sample are almost identical to the ones presented in Table 1. A more serious limitation is that unmarried persons are not included in the sample. For women, this is only a problem for the youngest age group, where a small segment of the most modern women (those who have delayed marriage for a few years) are missed. The sample of men is more biased, given that delayed marriage is more common for men than women. The computed mean years of schooling in Table 1 is an underestimate of the true mean because the top IFS educational category of 13 years of education or more was coded as 13.

Even with these limitations of data, Table 1 shows a modest trend toward modernization in Iran. Although 70% of (married) women, between the ages of 20 and 29, had no formal education in 1977, this figure was a marked decline from those...
for women aged between 30 and 39 and 40 and 49 (80% and 88%, respectively). The proportion of women with urban origins increased from 12% to 30% across the three cohorts. Intercohort changes in the prevalence of employment prior to marriage were minor, but the changes were in the expected direction.

While the husbands between the ages of 30 and 39 in 1977 in Table 1 appear to be more "modern" (in terms of education and urban origins) than husbands aged between 40 and 49; the 20–29 age cohort appears to be more "traditional" than the 30–39 age cohort. The reason for this anomaly is because the IFS sample of married men aged from 20 to 29 is probably more rural and less modern than the entire cohort of men at this age (more modern men in their twenties are more likely to have postponed marriage).

In spite of these inconsistencies, our overall reading of Table 1 is of a slow but real trend towards modernization that should lead to a decline in traditional patterns of marriage and family structure.

MODEL AND HYPOTHESES

Our adaption of Goode's model of modernization and consanguinity is presented in Figure 1. In Goode's framework, arranged marriage is the key variable that mediates the effects of social change and the social status of brides and grooms on consanguineous marriage. While arranged marriage is not measured in the IFS, there are many other IFS variables that can be used to test hypotheses derived from Goode's theory.

The key exogenous variable in this model is the respondent's year of (first) marriage, which is our proxy for the time path of modernization that is hypothesized to condition all the other variables in the model. The primary impact of modernization is to raise the status of women and their spouses, which in turn should reduce consanguinity. Time is allowed to have a direct impact on consanguinity in addition to the indirect paths via the characteristics of brides and grooms. The respondent's background, represented by woman's origin, woman's education, and woman's work before marriage, is hypothesized to influence consanguinity directly and indirectly through her age at marriage.
The wife's attributes may also affect consanguinity indirectly via her husband's characteristics (the logic of putting the wife's characteristics prior to the husband's is an analytical simplification of the assortative mating process). Husband's background, represented by his origin, education, and occupation, is hypothesized to influence consanguinity directly and indirectly through woman's age at marriage. More "modern" husbands may be more likely to marry older women. All of these variables are hypothesized to affect consanguinity either directly or indirectly through subsequent variables.

The hypotheses in Figure 1 can be stated as follows:

1. Women marrying in later decades will have a lower prevalence of consanguinity than women marrying in earlier decades.

The IFS includes women who were first married from the late 1930s to the year of the survey (1977). Assuming a slow (and probably irregular) process of modernization, we would expect the level of consanguinity in Iran to decrease over time as an increasing number of individuals achieve higher social status and (presumably) have fewer arranged marriages. Modernization may have a direct influence on the practice of consanguineous marriage in Iran through cultural diffusion. The diffusion of ideas about individual autonomy and the freedom of mate choice might be measured by the direct impact of period (year of marriage) on consanguinity, net of the effects of the intervening social status variables.

2. Women with an urban origin will have a lower incidence of consanguinity than women with a rural origin.

3. Women whose husbands have an urban origin will have a lower incidence of consanguinity than those married to men with a rural origin.

The effect of urban/rural origin on consanguinity is hypothesized to operate primarily through origin's effect on education. There is a strong correlation between urban origin and education for both men and women in the IFS.

4. Women with more education will have a lower incidence of consanguinity than women with little or no education.

5. Women married to men with more education will have a lower incidence of consanguinity than women whose husbands have little or no education.

Iranian women who stay in school longer should be more likely to enter the labor force and delay marriage. Women who delay marriage should be less likely to have an arranged marriage and therefore less likely to have a consanguineous marriage. Also, women who receive more education may receive more exposure to Western ideas about freedom of mate choice and women's emancipation from family control.
Men with more education in Iran are also more exposed to modern ideas about independent mate selection and consequently may view arranged marriage as undesirable. Educated men may also have greater opportunities for interaction with women who are nonrelatives than do men with less education. Al-Thakeb (1985) suggested this interpretation as the reason why well-educated men in Kuwait were less likely to marry relatives than less educated men.

6. Women who worked before marriage will have a lower incidence of consanguinity than women who did not work.

7. Women married to men who work in high-status occupations will have a lower incidence of consanguinity than those married to men who work in low-status occupations.

Women in Iran who worked before marriage should be more likely to delay marriage and to avoid having a groom chosen for them. Applying Al-Thakeb’s (1985) reasoning to women, it is plausible that working women have greater exposure or contact with unrelated men than do women who do not work. Men who work in high-status occupations may marry at an older age and also be exposed to high-status women who have also postponed marriage.

8. Women who marry at later ages will have a lower incidence of consanguinity than women who marry at younger ages.

In the absence of a variable measuring an arranged marriage, women’s age at first marriage becomes the key intervening variable predicting consanguinity. Age at marriage should mediate at least some of the effects of the other variables on consanguinity (see Figure 1). A woman who marries relatively late (in the Iranian context, this means age 20 or older) may be able to avoid having her marriage arranged. This should increase her chances of marrying a nonrelative.

DATA AND MEASUREMENT

The 1976–77 Iran Fertility Survey (IFS) consisted of a household survey and a survey of individual ever-married women aged from 15 to 50. Using a sampling frame from the 1976 Census, IFS households were selected using a multistage probability sample designed to represent the entire country. From the original listing of 6,056 living quarters, 5,730 households were successfully interviewed after three call-backs to each identified housing unit. From the sample of IFS households, 4,932 eligible respondents, defined as ever-married women between the ages of 15 and 50, were interviewed. Nonresponses for 42 cases rendered an effective sample size of 4,890 ever-married women. For this analysis, the sample was limited to 4,667 ever-married women who were married only once.

The IFS was part of the broader World Fertility Survey Project, with data collection conducted by the Statistical Center of Iran in 1977; analysis and publication of the IFS data were postponed because of the Iranian revolution in 1979. After the IFS data were released to the Shiraz University Population Center in 1984, a descriptive report of fertility based on IFS data was published by Homa Agha (1984), with consultation by Akbar Aghajanian. The Iran Statistical Center has also published a preliminary report on the survey (1986). The current research project, of which this article is a part, is based upon the collaboration of the Iranian Statistical Center and Akbar Aghajanian. The primary focus of the project is the analysis of Iranian fertility trends with IFS data (Aghajanian, 1992; Aghajanian & Gross, 1991; Aghajanian, Gross, & Lewis, 1993; Raftery, Lewis, & Aghajanian, 1993; Raftery, Lewis, Aghajanian, & Kahn, 1992). The IFS is the first nationally representative survey that contains detailed information on fertility, contraceptive knowledge and use, socioeconomic background, and consanguineous marriage for women in Iran. More recent national data on fertility and family patterns in Iran are not available.

The dependent variable of consanguinity is based on a question in the individual IFS questionnaire that asked the respondent if she was a relative of her current or most recent husband. The response categories to this question were: “near relative,” “far relative,” or “no relation.” The Farsi terms used for the response categories in the original questionnaire have similar meanings to the English translations used here. Based on discussions with knowledgeable experts, we think that urban respondents probably interpreted “near relative” as being a first cousin and “far relative” as being a second or third cousin or other relative. In the rural areas of Iran where kinship terms, such as cousin, are often used as terms of address, it is more difficult to assume a common understanding of the degree of relatedness implied by near and far relatives.

To explore the meaning of “near” and “far” relative of the respondent’s spouse, we cross-tabulated the dimension of relatedness (near relative,
far relative, no relation) by many other variables in the data set. Overall, almost 40% of respondents in the IFS sample reported being married to a relative, with about 24% to a near relative and 15% to a far relative. Although the overall level of consanguinity (the sum of the two categories) varied across levels of other variables, the division between near and far relatives was fairly consistent across subgroups of the population (roughly a 60-40 split). Accordingly, we grouped the two categories of near and far together in a dummy variable with all consanguineous marriages coded 1 and all nonconsanguineous marriages coded 0. We use the term consanguinity interchangeably with cousin marriage.

To measure the trend in marital patterns, the calendar year of the respondent's first marriage was constructed from several questions in the individual questionnaire that measured the timing of first marriage of the respondent. Because only respondents age 50 and below are included in the 1977 IPS sample, the estimates of marriages for prior years are based on a restricted age range. For example, the IFS sample of women married in year 1950 are limited to those married at age 23 or younger (50–[1977–1950]). Since most Iranian marriages are contracted before age 20, we feel that the IFS can yield fairly reliable estimates of consanguinity from the late 1940s to the mid-1970s.

For women who were married more than once, the IFS has information on the current or most recent marriage but no information on the consanguinity (and other characteristics) of the first husband. Women who were married more than once are excluded from the following analyses because many of our independent variables relate to the circumstances of the first marriage (year of first marriage, woman's work before first marriage, and woman's age at first marriage). Excluding these women does not significantly reduce the sample size, since 94.7% of ever-married women in the IFS were only married once at the time of the survey (N = 4,667 women). The small number of formerly married women (widowed or divorced) who were married only once are included in the analysis. The level of consanguinity among women in second or higher order marriages (who are excluded from this analysis) is much lower than the sample of women married only once (the numbers are 20% and 40%, respectively). Perhaps the lower incidence of consanguinity among higher order marriages is because such marriages are less likely to be arranged (Huzayyin, 1976).

The Trend in Consanguinity

The first step of our analysis is to examine the trend in consanguinity by respondent's year of first marriage. Figure 2 shows a simple 3-year moving average of the incidence of consanguinity (shown as the percentage of all marriages in the year) from 1946 to 1976. As noted earlier, the IFS-based estimates of consanguinity for earlier years are selective of young marriages (e.g., only marriages to women, age 20 or below, are measured for 1946).

In spite of the selectivity of the sample for the earlier years in the series, the overall upward trend evident for most years from 1946 to 1976 is not an artifact of measurement. The upper cutoff of age 20 in 1946 only excluded a small handful of women married in that year. The one subsequent period with little overall change was the 1960s. In contrast, there were modest (about 5 percentage points) but real rises in consanguinity during the 1950s and the 1970s. This finding is opposite to what might be expected if modernization, representing the central force of change in Goode's hypothesis, were the dominant influence on changing marriage and family patterns. In the balance of this article, we explore patterns of consanguinity across social groups in Iranian society and inquire whether the observed trend may be a function of the changing socioeconomic characteristics of brides and grooms.

The Social Correlates of Consanguinity

Table 2 shows the levels and trends in consanguinity for four background characteristics of the respondents in the IFS: the woman's origin, her education, her work experience before first marriage, and her age at first marriage. The percentage of consanguineous marriages is presented for each category of the four independent variables for the total sample and by four marriage cohorts: the 1940s and before, the 1950s, the 1960s, and the 1970s. These time periods are identified by the respondent's year of marriage. Sample sizes for each category are reported in parentheses beside each percentage.

The incidence of consanguinity is lower for women who grew up in urban areas relative to those who were reared in rural areas (providing positive support for hypothesis 2). Consanguinity has increased across marriage cohorts for both origin groups, but the increase is greater for the rural-origin women. The same general pattern of
an inverse relationship between women's status and consanguinity holds for the other three variables in Table 2 (hypotheses 4, 6, and 8 are supported).

Relatively few Iranian women have any formal schooling, and the deficit is greatest for the oldest age group who were married in the 1940s. Women with some schooling were less likely to marry their cousins than women without any schooling. There has been a general increase in consanguinity over time for women with no schooling and for those with 1 to 5 years of schooling. For the relatively small segment of women with 6 or more years of schooling, there has not been an increase in consanguinity.

The work status before marriage variable shows that it is not formal employment, but the nature of work that makes a difference. Women who worked in agriculture or in production jobs ("blue collar") were just as likely as women who did not work to marry their cousins. For these three categories, there has been an increase (albeit uneven) in consanguinity across marriage cohorts. The most common nonagricultural employment for Iranian women is carpet weaving. Women typically work in their own homes in rural areas in quite traditional settings. It is only for the very small number of women working in white collar or service occupations ("modern sector" employment) before marriage that the incidence of consanguinity decreases over time (only the last two decades have a sufficient number of cases to report figures).

The incidence of consanguinity increases over time for women who married at age 20 or earlier, while the reverse is true for the small numbers of women who married at age 21 or older. In the 1970s, the level of consanguinity among women who married at age 21 or above was only half of the comparable figure for women who married at younger ages.

The patterns of consanguinity by the characteristics of women generally support Goode's thesis that modern social roles lead to a decrease in
consanguinity. The only anomaly is the rise in consanguinity from the 1950s to the 1970s for women in the low- and medium-status categories. The socioeconomic correlates of men and consanguinity, as shown in Table 3, show a more complex pattern.

In Table 3, the incidence of consanguinity is presented by husband's origin, education, current occupation, and age at current marriage. Note that the unit of analysis remains the women respondents (the sample of men is composed of husbands currently married to women from age 15 to 50). The last two independent variables in Table 3 are not exact parallels of the respondent's characteristics. While husband's current occupation is temporally subsequent to marriage, current position is probably a good proxy for his occupational status at the time of marriage (assuming relatively little occupational mobility for men). Because data were not collected on husband's marital history, we only have husband's age at current marriage, not necessarily his first marriage.

The incidence of consanguinity is much lower for women with urban-origin husbands (confirming hypothesis 3). The incidence of consanguinity for the urban-origin sample of husbands has remained roughly stable over time, while the incidence of consanguinity for women who married men with rural origins has risen steadily over the decades.

For husband's education, the expected inverse relationship is not found (contradicting hypothesis 5). The incidence of consanguinity is roughly the same for all three levels of husband's education and there have been increases over time for all levels of husband's education. This unexpected pattern is addressed more fully in the multivariate analysis section and in the concluding section of the article.

The expected relationship between higher social status and lower consanguinity is evident for husband's occupation. There are much higher levels of cousin marriage for women married to men in agricultural and "blue collar" occupations (production, transport, and unskilled labor). While the overall level of consanguinity is lower for women married to men in higher status occupations (professional, administrative, clerical, and sales), the trend is not linear. For some white collar occupations, there was a rise in consanguinity in the 1960s (relative to the 1950s) and then a decrease in the 1970s. There were steady increases in consanguinity across all decades for women married to men in the lower occupational ranks (agriculture and unskilled labor). The incidence of consanguinity is lower for women whose husbands married at 26 or older. There are fluctuations in consanguinity over time across husband's age categories that defy a simple interpretation.
If the women in the IFS sample are divided along the dimension of tradition and modernity, a general conclusion can be drawn from Tables 2 and 3. From the 1940s to the mid-1970s, it appears that the incidence of consanguinity increased for women in the more traditional categories, while consanguinity remained stable or decreased for more modern women. A few exceptions to this general trend can be found in Tables 2 and 3. The two main exceptions are women with urban origins and women with highly educated husbands. The incidence of consanguinity for these two groups of women has generally increased over time.

**Multivariate Analysis**

We now turn to a multivariate analysis of the hypotheses presented in Figure 1. With consanguinity measured as a dichotomous dependent variable (nonconsanguineous marriage = 0, consanguineous marriage = 1), logistic regression is used to estimate the impact of the modernization variables on the natural log of the odds of a consanguineous marriage (Morgan & Teachman, 1988) based on the IFS sample of 4,667 women who have been married only once.

Prior to the regression analysis, all independent variables were examined to determine if statistically significant or substantively important nonlinear relationships with consanguinity were observed. This evaluation was based on the observed bivariate relationships between consanguinity and each value of the independent variables. Based on these preliminary analyses, each independent variable was recoded to best represent the observed nonlinear relationship. The final coding of husband's education was based on an OLS regression where consanguinity was the response variable and dummies for each year of husband's education were included with all of the other independent variables. (The final codings for the independent variables, as well as means and standard deviations, are available upon request.)

A potential problem in multivariate analysis is high intercorrelations among the independent variables in the equations. Although the large sample size of the IFS increases the stability of the estimates even with highly intercorrelated independent variables, we examined all bivariate correlation coefficients to detect potential problems (results available from authors upon request). The only potential problems are the intercorrelations of education and rural/urban origin for both husbands and wives (0.51 and 0.89, re-
spective). Rural women and men were concentrated in the lowest rungs of the educational classification. We have examined the patterns of effects from the multivariate equations estimated here and those from detailed cross-tabulations of consanguinity and these variables. The findings are broadly similar, although there are some subtle interactions that are not evident in the multivariate models. These variations are noted in the appropriate findings below.

The recursive model in Figure 1 can be represented by a set of four structural (logistic regression) equations. The first model includes only year of marriage, which is our proxy for modernization. The total effect of each independent variable on the logit of the probability of consanguinity can be decomposed into direct and indirect effects (Raftery & Hout, 1985). Here, our interest is in how the effect of modernization is mediated through wife’s characteristics (Model 2), husband’s characteristics (Model 3), and the wife’s age at marriage (Model 4).

In addition to the coefficients, Table 4 presents the L-square (the deviance) and the model chi-square for each of the logistic regression equations. The L-square is analogous to the residual sum of squares in OLS regression, while the model chi-square reflects the improvement the equation makes over a model with no predictors (Morgan & Teachman, 1988; Weisburg, 1985). In each equation, dummy variables were included to represent the missing data categories for each independent variable. Each “missing data” dummy variable was set to 0 when the relevant independent variable had a nonmissing value, and set to 1 when the relevant independent variable had a missing value. The coefficients for the missing-variable dummies are not reported in Table 4. The dashes in cells of Table 4 represent the omitted category for a set of nominal categories (the coefficients for the other categories in the set are deviations from the omitted category).

The coefficient for trend (based on the woman’s year of marriage) is positive and significant in all the equations. This result confirms the finding from Figure 1 that the incidence of consanguinity has increased over time in Iran (except for a few small modern groups; see Tables 2 and 3). Interestingly, the impact of modernization on consanguinity is largely direct. Goode’s theory is that modernization raises the status of the population which then leads to a decrease in arranged

| Table 4: Estimated Coefficients from Logistic Regression Models |
|-----------------|-----------------|-----------------|-----------------|
| **Independent Variables** | **Model 1** | **Model 2** | **Model 3** |
| Intercept | -.7512** | -.7666** | -.5528** | -.5565** |
| Woman’s year of marriage | .0139** | .0187** | .0156** | .1068** |
| Woman’s origin (urban) | -.0935 | .0074 | -.0059 |
| Woman’s education 0-3 years |  |  |  |
| 4-8 years | -.3713 | -.2728 | -.2716 |
| 9-11 years | .0524 | .1070 | .1066 |
| 12 or more years | -.5400* | -.5226 | -.4151 |
| Woman’s work before marriage |  |  |  |
| White collar | -.6475* | -.6330* | -.4445 |
| Blue collar | -.0056 | -.0457 | -.0395 |
| Agriculture | -.0599 | -.1724 | -.1667 |
| Did not work |  |  |  |
| Husband’s origin (urban) |  | -.4617** | -.4578** |
| Husband’s education |  |  |  |
| No education |  |  |  |
| 1-6 years | .1730* | .1705* |
| 7-11 years | .1814 | .1897 |
| 12 or more years | .5850** | .5982** |
| Husband’s occupation |  |  |  |
| White collar | -.3533** | -.3480** |
| Blue collar | -.1274 | -.1197 |
| Agriculture |  |  |  |
| Woman’s age at marriage (age ≥ 21) |  |  | -.6005** |
| L-square | 6241.42 | 6184.34 | 6129.52 | 6108.31 |
| Model chi-square | 21.53** | 78.61** | 133.44** | 154.65** |

*Chi-square significant at the .05 level. **Chi-square significant at the .01 level.
marriages and to a decline of traditional family forms such as consanguinity. Only the inclusion of husband's characteristics in model 3 mediates a fraction of the impact of year of marriage.

Net of other variables, respondent's urban/rural origin is not a significant predictor of consanguinity (the educational variable overlaps heavily with rural/urban origin). There is a significant direct effect of the highest education category on lowered consanguinity (there are only non-significant differences across the lower levels of education). The impact of the highest level of female education parallels the effect of women working in high-status white collar occupations. About one-third of the impact of both high-status roles (education and premarital work experience) is mediated by a later age at marriage, but the majority of the impact of modern female roles on consanguinity is direct.

The impact of husband's statuses on consanguinity is peculiar. As observed earlier in the bivariate tables, the impact of urban origins and a white collar occupation is negative. But the net impact of husband's education is positive, with highly educated men more likely to be married to cousins than men with lower levels of education. Finally, woman's age at marriage has the expected effect: Women who married after the age of 20 are much less likely to marry a relative. Although we have no direct evidence, we suspect that a woman's age at marriage is probably highly correlated with whether the marriage was arranged.

One of the difficulties in interpreting the logistic regression coefficients is the coding of the dependent variable (the log of the odds ratio). To provide a more conventional expression of the coefficients, Table 5 shows the impact of the independent variables in the Table 4 equations in terms of the probability of a consanguineous marriage. The effects of a unit change in an independent variable in a logistic regression depends on the value of the independent variable as well as the other independent variable in the equation (see DeMaris. 1990). In Table 5, all of the independent variables are set near or at their average values. The transformation of the coefficients was computed only for variables that are significant at the .05 level or better in Table 4.

The year coefficient in the first model of Table 5 shows that consanguinity rose by 3.4 percentage points every 10 years of the era (assuming a monotonic linear trend). This linear summary of the bivariate relationship is only an approximation of the actual trend presented in Figure 2. The real value of the multivariate analysis, however, is to test how the increasing trend in consanguinity is mediated by the rising level of social and economic characteristics of brides and grooms over time. Model 2 (in Table 5) shows an increase in the year coefficient from Model 1. This means that the underlying rise in consanguinity is actually greater than the observed trend. The modernization of the socioeconomic characteristics of women in more recent marital cohorts has partially suppressed the underlying trend of rising consanguinity. The same effect is evident with the inclusion of female age at marriage in Model 4. What has been the impetus behind the rise in consanguinity over this period if rising levels of female status have worked to lower consanguinity? A partial answer is given in Model 3 with the inclusion of husband's characteristics. The improvement in the status of men (educational attainment) does explain a significant part of the rise in consanguinity over time, but most of the rising trend in consanguinity is unrelated to any of the variables in this analysis.

The importance of modern female roles in lowering the probability of marrying a cousin is illustrated with the total effects of 12 to 14 percentage points for higher education and premarital modern sector employment in Model 2 of Table 5. The transformed coefficients in Table 5 show that women who marry men with 12 or more years of

| Table 5. Effect of a Unit Change in an Independent Variable on the Probability of Consanguinity |
|----------------------------------------------------------|-----|-----|-----|-----|
| Independent Variables | Model 1 | Model 2 | Model 3 | Model 4 |
| Woman's year of marriage | .0034 | .0046 | .0039 | .0042 |
| Woman's education (12 or more years) | -.1241 | | | |
| Woman's work before marriage (white collar) | -.1462 | -.1485 | | |
| Husband's origin | -.1106 | -.1103 | | |
| Husband's education | | | | |
| 1-6 years | .0432 | .0426 | | |
| 12 or more years | .1446 | .1475 | | |
| Husband's occupation (white collar) | -.0856 | -.0847 | | |
| Woman's age at marriage | | | | -.1423 |
TABLE 6. CONSANGUINITY BY WIFE’S AGE AT FIRST MARRIAGE AND HUSBAND’S AGE AT CURRENT MARRIAGE

<table>
<thead>
<tr>
<th>Husband’s Age at Current Marriage</th>
<th>Woman’s Age at First Marriage</th>
<th>Married Relative</th>
<th>Married Relative</th>
<th>Married Relative</th>
<th>Married Relative</th>
<th>Married Relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;15</td>
<td>15–17</td>
<td>&lt;15</td>
<td>50%</td>
<td>52%</td>
<td>48%</td>
<td>35%</td>
</tr>
<tr>
<td>15–17</td>
<td>18–20</td>
<td>52</td>
<td>23%</td>
<td>44</td>
<td>44</td>
<td>37</td>
</tr>
<tr>
<td>18–20</td>
<td>21–25</td>
<td>1</td>
<td>13</td>
<td>26</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>21–25</td>
<td>26+</td>
<td>0</td>
<td>2</td>
<td>9</td>
<td>9</td>
<td>19</td>
</tr>
</tbody>
</table>

Note: Percentages not reported for cells where n < 20; women and men with age at marriage less than 9 are excluded from the table.

schooling are almost 15 percentage points more likely to have a consanguineous marriage than men with no education. This is in contrast to the bivariate finding of a weak relationship between husband’s education and consanguinity in Table 3. A closer examination of detailed cross-tabulations showed that the positive impact of husband’s education on consanguinity is largely confined to the rural sector (where the number of highly educated men is fairly few).

Another very important potential interaction is the independent and joint effects of husband’s and wife’s characteristics on consanguinity. The assumption of additivity in the multivariate model disguises the potential overlapping patterns of influence. To illustrate this issue, Table 6 shows the incidence of consanguinity by husband’s age at current marriage and wife’s age at first marriage.

In general, young brides and grooms are much more likely to marry their cousins. However, even for men and women marrying in the middle age range (18–20), the level of consanguinity is generally well over 40%. It is only for the oldest age categories (women above 21 and men above 26) that the level of consanguinity declines. For men who marry above age 26, there is a significantly lower level of consanguinity, regardless of the age of the bride. Perhaps the delay of marriage means selecting a spouse outside the traditional kin networks. The delayed marriages may also be disproportionately composed of persons with the most modern characteristics. The older category of men (above age 26) may include a significant number of men who are entering their second marriage, which may mean selecting a spouse outside the kinship system. These speculations need to tested in future analyses.

CONCLUSIONS

The results of this study provide mixed support for Goode’s thesis that modernization and higher social status will lead to a decline in consanguineous marriage. Many of the key independent variables, including all of the wife’s characteristics and two of the husband’s attributes (urban origins and occupation) have precisely the effect that Goode predicted. Modernization, from the late 1940s to the mid-1970s, has led to a gradual increase in the proportions of women in Iran with more education, working before marriage, and a later age at marriage. Women in these modern roles are less likely to marry their cousins than are women in more traditional statuses.

However, there are several anomalies with results in unexpected directions. In spite of the rapid economic and social changes in Iranian society from the 1950s to the 1970s, the overall incidence of consanguinity appears to have increased over this time period. More specifically, the incidence appears to be increasing for the more traditional groups in society. The other unexpected finding is that husband’s education seems to be only weakly related to consanguinity (and positive in the rural sector). This is in sharp contrast to wife’s education and husband’s urban/rural origins and occupation, for which higher status leads to lower consanguinity. These unexpected findings deserve some speculation even if we cannot provide satisfactory interpretations.

The time trend of consanguinity in other countries is largely unknown. Khiat (1988) reported that consanguineous marriage has decreased over the last several decades in Beirut, Lebanon. Khoury and Massad (1992), however, reported a stable trend of consanguineous marriage in Jordan from 1900 to 1964. The trend in Iran may not be unusual, but more comparative data are needed to address the question.

One possible explanation for the rise in consanguinity, especially for rural and traditional populations, may be increased availability of first cousins and other relatives of marriagable ages.
The significant reduction of infant and child mortality in Iran from the 1940s to the 1960s certainly increased the pool of eligible cousins in the decades prior to the 1977 IFS. In a context with constant cultural preferences (cousin marriage being the ideal), the increasing availability of cousins of marriageable ages would result in an increasing incidence of consanguineous marriage. There may have been an increasing availability of cousins in urban areas as well, but the effects of availability may have been offset by other changes in socioeconomic status and cultural change resulting from modernization.

In response to an early draft of this article, our colleague, Akbar Aghajanian, suggested that certain historical events in Iran may have been important factors in increasing the desirability of consanguinity. The most important of such factors was the land-reform program implemented in the early 1960s (Lambton, 1969). Land reform allowed many landless families in rural areas access to small plots of land. These families may have used cousin marriage as a means to pool their newly acquired economic resources.

The lack of a negative impact of husband’s education on consanguinity in Iran is unusual, but other studies in the Middle East do not report consistent results. Saedi-Wong et al. (1989) found a negative relationship between husband’s education and consanguinity in Saudi Arabia. Husband’s education had no effect on consanguinity in Khlat’s (1988) study of Beirut. In a survey of households in Kuwait, Al-Thakeb (1985) found that highly educated husbands were less likely to have married their cousins than were men with less education. Khoury and Massad (1992) showed that a nonlinear relationship exists between husband’s education and consanguinity in Jordan. Men in Jordan with no education or a university education have the lowest incidence of consanguineous marriage, while men with primary and secondary education have the highest incidence of consanguinity.

Men with higher education (as with women in the same status) are likely to be exposed to the forces of modernization and have a wide pool of eligible marriage partners to consider beyond the immediate kin network. But families, as well as individuals, have a strong stake in marriage selection in Iranian society. A son with higher education may be a valuable family resource, and families may try to exercise greater control over the selection of his marriage partner (Khoury & Massad, 1992). The families of educated men may use cousin marriage as a way to maintain family property (Goody, 1976). This interpretation rests on the assumption that families consider the selection of spouses for highly educated sons differently than selection for highly educated daughters.

The empirical association between husband’s status and consanguinity in this analysis is also confounded because of multicollinearity—the high correlations between two of the background variables. The positive effect of husband’s education on consanguinity (as reported in Table 4) is largely due to its joint association with rural/urban origins. There is a positive effect of husband’s education among men with rural origins, but the number of highly educated men with rural origins is very few. Among men with urban origins, there is little effect of education on consanguinity. These complex patterns require more analysis than is possible here.

Finally, the rise in consanguinity and the anomalous effect of husband’s education on the probability of consanguinity raise questions about the linear process of modernization and changing family structure. There are certainly systemic pressures in the directions that Goode predicted, but there may be other factors that have shaped the observed trends. Forces of modernization in Iran during this period may have been too tentative to have had the impact that Goode predicted. The impact of the Iranian oil boom was evident in economic levels and government spending, but the changes in the statuses of men and women over this period were very modest. Perhaps a better test of Goode’s modernization thesis would occur in a society that is undergoing a much greater shift in social and economic levels of men and women. A final point to stress is that, during periods of social change, there may be differences between short-term and long-term responses in cultural norms such as a preference for consanguinity.

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