
**Religiosity and Investments
in Spousal Productivity**

(with Shoshana Neuman)

Religiosity, defined as a set of personal attributes, skills, and preferences inspired or emphasized by religious ideology,¹ is expressed in the form of (1) religious activities such as church attendance or observance of religious codes of behavior, and (2) purchase of religious goods and services. These religious activities and goods--hence defined as *religion*--can be analyzed as either consumption or investment. Religiosity is human capital to the extent that religion can be considered as an investment. For instance, religion can provide peace of mind and, consequently, lead to improved health, which in turn may lead to higher labor productivity on the job or in marriage (i.e. in labor and spousal labor, as defined in Chapter 3). Furthermore, religion can also be viewed as investment to the extent that engaging in religious activities today can improve individual satisfaction from such activities in the future.

If religion is consumption, religiosity has no impact on future productivity at home, outside the home, or in leisure defined as time for self. While recognizing the other aspects of religiosity, in this chapter we focus on religiosity as a form of human capital, and more specifically, on spouses helping investments in such human capital.

Spousal labor is similar to labor in many ways. One aspect of such similarity is that people can invest in their human capital raising their pro-

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ductivity both at work (labor productivity) and in marriage (productivity in spousal labor). Some of these human capital investments occur in the process of working, in which case we have on-the-job-training at the workplace and in-marriage-learning in the case of marriage. Individuals learn skills on the job or in a marriage through experience and exposure to co-workers or spouses. One can possibly invest in religiosity as human capital by learning from a spouse's practice of religion. If such investments take place, one expects a positive correlation between individual and spouse's religiosity. As others did before us, we find that when both spouses have a similar religious orientation the husband participates more intensively in religious activities (see Azzi and Ehrenberg 1975, Long and Settle 1977, Ehrenberg 1977, Neuman 1982, Ulbrich and Wallace 1983). While such positive correlation between spouses' religiosity can be interpreted in terms of investment in correlation human capital, it also makes sense as the reflection of compatible preferences in consumption. The advantage of looking at this question from the perspective of investments in spousal productivity is that it helps us derive hypotheses regarding factors influencing the positive correlation between husband's and wife's religiosity. These hypotheses are then tested using a sample of Israeli Jewish couples.

In view of a general lack of adequate measures of religiosity, especially in studies of economic behavior, our empirical work is restricted to an estimation of the impact of wives' religiosity on Jewish husbands' time spent on religious observance. By further exploring the association between spouse's religiosity and individual behavior we possibly find evidence of a post-marital learning process. We also find that the men whose religious observance is strongly correlated to wife's religiosity tend to have higher levels of secular education, which possibly reflects the effect of education on the process of in-marriage-learning.

It is by now well established that economic behavior, such as work and consumption, is affected by family considerations. Ever since Mincer's (1962) pathbreaking work on female labor supply in a family context, wives' labor supply, and very often husbands' labor supply as well, has been modeled as a family decision. Triggered in part by Becker's (1965) and Lancaster's (1966) theory of household allocation of time, economists have been studying an increasing range of economic behavior within a household context. The perspective taken in this book

is a variation on that theme. Instead of families jointly allocating their resources, individual decision-making is conceived of as constrained by spousal availability and characteristics. A number of existing findings can be interpreted either in terms of joint household decision-making or individual decision-making taking account of marriage markets.

- (1) Wives' added worker effect (Mincer 1962) describing an observed tendency for married women to enter the labor force when their husbands are unemployed.
- (2) Some aspects of husbands' labor supply have been shown to vary with wives' labor related characteristics such as her wages or potential wages (Lundberg 1985).
- (3) Benham's (1974) finding that husbands of more educated wives earn higher wages has in part been interpreted as evidence for wives' contribution towards their husband's productivity at work (see Chapter 12). Likewise, one could potentially interpret large observed positive differentials in wages between married and unmarried men as an indication of wives' contribution to their husbands' productivity. Substantiation for such claims found in the sociological literature and alternative interpretations of marital status differentials in earnings are discussed in earlier chapters. Marital differentials in men's earnings are also expected to be related to individual characteristics of both husband and wife, and the type of matching between such characteristics. Marital differentials in men's earnings, men's marital status, and type of matching are probably jointly determined. The economic literature which considers households as given cannot incorporate such simultaneity. In contrast, all these variables can be incorporated simultaneously on the base of the theoretical framework presented in this book, which examines the joint determination of selection of wife's and husband's characteristics and wife's labor supply.
- (4) Economic behavior and marriage are also related in the sense that factors influencing the marriage market, such as the ratio of male

to female marriage eligibles, affects female labor supply (see Part Three).

- (5) Economists working in the household economics tradition have also studied spouses' effects on aspects of behavior not considered as "economic" in a strict sense. For instance, health economist Grossman (1976) has found that wives' schooling has a positive impact on husband's health.

Economists have thus established that spouses' characteristics such as labor force participation, wages and education, affect the economic as well as non-economic behavior of married men and women. One effect on individual behavior that has been neglected is the effect of own and spouse's religiosity.

The lack of attention economists pay to religiosity as a factor influencing economic behavior results in part from a view pervading Western thought which separates religious from worldly matters. Such separation is reflected even in journals such as *The Journal of Political Economy*, which has been associated with the new household economics for many years. The articles it has published which deal with religion have studied religious activities such as church attendance or contributions to charities as dependent variables (Azzi and Ehrenberg 1975, Long and Settle 1977, and Ehrenberg 1977). When economists study the relation between economic behavior and religion, they generally use poor indicators of type and level of religiosity, such as current religious affiliation, or Jewish background (e.g., Friedman 1972, Solomon 1980, Tomes, 1983). Economists have rarely used variables indicating degree or nature of religiosity in terms of depth or type of beliefs or level of skills and attributes taught or emphasized by a religion. Exceptions are Medoff's (1984) study of female relative success at work as a function of religiosity defined as percentage of the population in fundamentalist Christian denominations, Medoff and Skov's (1992) study relating the same measure of religiosity to marriage, divorce, and other demographic variables, Tomes' (1984) research on earnings and religion in which an individual was raised, and Lerner and Chiswick's (1992) study on religion and divorce. Some sociologists, especially those working in the Weberian tradition, have looked more at the content of religiosity as it relates to economic behavior but their contributions also have serious shortcomings (e.g., Greeley 1963).

The following theory analyzes the effect of own religiosity and spouse's characteristics, including religiosity, on economic behavior.

Theory

Within a framework of allocation of time by utility-maximizing individuals, labor supply and consumption are a function of time spent by spouse on various activities as well as of characteristics of self and spouse. The same explanatory factors also affect the amount of time allocated to other dimensions of behavior, often called leisure.

The following model is in the tradition of previous theories of allocation of time such as Becker's (1965). It is different in that it treats individual members of a household as separate maximizers. Although spouse's influence on own behavior has been analyzed in past economic research, it has been done within the theoretical framework of household utility maximization, which assumes the existence and composition of a couple as given. In contrast, in the theory of labor and marriage presented in this book the decision to marry or to stay married is integrated with other choices, such as labor supply or consumption. This model also differs from previous theories of allocation of time to religious activities (e.g., Azzi and Ehrenberg 1975) in that it considers religiosity as a set of attitudes and skills.

Assume an individual i can allocate time to two types of activities, work and spousal labor.² A utility function is defined directly in terms of inputs:

$$U_i = U_i(l_i, h_i, h_j, x_i) \quad (15.1)$$

where $i, j = m$ ($m = \text{male}, f = \text{female}, i \neq j$); l denotes time allocated to labor; h is home-time; and x denotes commercial goods.

Home-time is defined as any time not spent at work (it includes both spousal labor and time for self, in terms of the model presented in Chapter 3). Own labor may generate disutility, i.e. the first derivative of U by l is assumed to be negative whereas the first derivatives of U by the other inputs are generally positive. One of the inputs is time the spouse contributes to the home h_j . Marriage is viewed as an exchange of spousal labor, defined as an activity an individual engages in for his or her spouse's benefit. In terms of equation 15.1, some h_i could

be conceived of as spousal labor, the rest being pure leisure or time for self. (The model defines h_j , spouse's home time, purely as labor benefiting the spouse). All men and women interested in marriage participate in marriage markets, specifically defined as markets for wives' and husbands' spousal labor (see Chapter 3). Equilibrium values of the quasi-wage for spousal labor, w^* , are established in such markets. Individual marriages occur when at market w^* 's the quantity of spousal labor supplied by one spouse equals that quantity demanded by the other spouse. Costs of divorce may keep some marriages alive even if there are potentially preferable matches available in the market. Individual skills and attributes which increase productivity and the utility of both kinds of time enter both the utility function and the following budget constraint:³

$$w_i(A_i)l_i + V_i = p_i x_i + w^*_j(G_j)h_j \quad (15.2)$$

where w is market wage for labor; w^* is market wage for spousal labor; V is non-wage income; p is the price vector for commercial goods, A are skills and attributes improving productivity at work, and G are skills and attributes improving home-time productivity (of both individual i and spouse j). Higher levels of A and G affect individual utility not only directly via productivity in l and h , but can also modify preferences, thus entering directly into equation 15.1.

By solving 15.1 subject to 15.2 and a time constraint, $T = l_i + h_i$, one obtains supplies of time to work and home-time and demands for goods and services. All these individual supplies and demands are functions of the skills and attributes affecting productivity at work and in the home and utility from the various activities, goods and services. Moreover, due to the interdependence of all three functions, spouse's skills and attributes affecting the utility of his time at home also have an impact on all allocative decisions. Any personal attribute influencing own productivity in spousal labor, G_i , or in labor, A_i , or in spouse's productivity G_j which could cause a shift in demand or supply of spousal labor, will influence the decision to marry and marital choice. Both spouses' productivity in spousal labor, G_i , and G_j , are elements by which marriage partners select each other. If higher levels of a particular type of G shift husband's and wife's demand

and supply of spousal labor to the right, selection of partners with highly correlated levels of G will be observed. This is called homogamy in the sociological literature, and positive sorting in Becker's (1974a,1981) theory of marriage.

Skills and attributes which increase spousal productivity are generally expected to lead to homogamy. First, because they simultaneously increase demand and supply of spousal labor. Second, after marriage occurs, an individual may become more productive in spousal labor because he or she benefits from a spouse's skills. Formally, this implies that in utility function 15.1 G_j enters as an independent term, not only as an influence on h_j 's productivity. Spouse j could also have a direct impact on i 's activity levels and on i 's productivity (see Chapter 12).

Any productivity-enhancing trait of a spouse, such as education, health, or religiosity, can be related to an individual's performance at work or in consumption due to a sorting mechanism or via a post-marriage effect, whereby spouse's j attributes G_j influence individual i 's productivity (in-marriage-learning) or behavior.

It is desirable to differentiate between selectivity in marriage and active contributions by spouses, in view of the many potential implications involved. For instance, if wives with given attributes actively encourage their husband's careers, that would add to the benefits men derive from marriage. Marriage would be viewed more in terms of an investment than as consumption, as it is generally viewed by economists.

In an attempt to disentangle selectivity from direct contributions by spouses, one can take account of marital duration and changes in individual behavior over time. This has been attempted by Kenny (1983) in the case of the association between marital status and earnings. As mentioned by Kenny (1983), this is no proof of the existence of investments in marriage.

Religiosity

The economics of human resources principally emphasizes two kinds of human capital A and G : education and investment in health. (As pointed out by Grossman (1976), investments in health and education are interrelated).

People's mental attitudes can also influence utility and productivity at work and in the home, as has been pointed out by behavioral scientists and

economists such as Leibenstein (1981). Religiosity as defined here is part of these mental attitudes and can also be viewed as a component of human capital A and G . For instance, belief in the puritan ethic can drive somebody to be a good worker on the job or at home. Consequently, own and spouse's religiosity could shift supplies of labor and demand for goods.

Moreover, one expects interactions between various types of skills individuals acquire, such as skills obtained through education, health and religiosity. For instance, religiosity and health could reinforce each other (a healthy soul in a healthy body), and education could weaken religiosity if values acquired through education stand in contradiction with religious tenets. The effect of a particular element of human capital on a particular activity or good need not necessarily be positive. The sign and impact of religiosity will depend on the values embodied in a religion (for instance, whether it encourages work effort), individual characteristics, and possible interaction effects between those two.

Religiosity is expected to influence work and consumption. It certainly is expected to influence time individuals spend "in the home," in the general sense of time not spent at work. In particular, people with more religious attitudes will generally spend more time on religious activities, a component of h . The time intensity involved with the implementation of a particular brand of religiosity may vary widely. For instance, Jewish religiosity, which we will study in the empirical section, implies many time-consuming activities, especially from men.

Next, this perspective is used to derive a number of predictions regarding the relationship between spouse's religiosity and individual time devoted to religious activities. This human capital perspective is valuable as a basis for interpreting the empirical results regarding the effect of wife's religiosity on husband's religious activities which are presented in the next section. The following empirical analysis attempts to separate between these two kinds of causality in the case of the well-known positive association between a husband's and a wife's religiosity. This positive association between a husband's and a wife's religiosity, which has been observed in the literature, could possibly result from the two kinds of causality mentioned above. First, there may exist a tendency for positive sorting, i.e., homogamy. Religious partners may select each other to avoid potential conflicts over values or to increase the household's productivity in the

production of services of a religious nature, including intergenerational (utility) transfers from grown-up children pursuing their parents' lifestyle. Such an approach is consistent with that of Ulbrich and Wallace (1983) who regard a situation where both spouses are of the same denomination "as enhancing the consumption benefits (joint consumption) or reducing the costs (marital discord)." Similarly, Azzi and Ehrenberg (1975) argue that "The social value of religious activity is probably higher for families in which both spouses are of the same religion."

Alternatively, a person could influence his or her spouse's level of religiosity through a process of investment in the partner, i.e. in-marriage-learning. Such investment could be direct through formal or informal religious teachings, or indirect in the form of encouragement, making time available for religious practice, or exposure to a role-model. This alternative explanation would reinforce the hypothesis that wives can influence their husband's productivity in the labor market and in health production.

We now look at religious activity, spouse's religiosity, marital duration and (secular) education.

Religiosity and Marital Duration. As mentioned above, if changes in individual behavior occur during the duration of a marriage, this could possibly mean that investments occur in marriage (although this is no proof). We consider religious activities as a component of h_i and religiosity of i and j as components of G_i and G_j . If there are no direct effects of G_j on h_i , but solely a selectivity effect, then at time 0, when the marriage starts

$$h_{i0} = h_{i0}(G_i, G_j) \tag{15.3}$$

where the selection of G_j reflects selectivity by homogamy. Similarly, at a later time T in the course of the marriage

$$h_{iT} = h_{iT}(G_i, G_j) \tag{15.4}$$

The effect of G_j on h_{i0} is not expected to differ from its effects on h_{iT} . But, if G_j has a direct effect on h_i it is predicted to grow over time with marital duration. Consequently, under such a scenario the effect of G_j on h_{iT} would be larger than

that on h_{i0} .

In light of this discussion, and the gender differentiation inherent in Judaism, the following hypothesis will be tested.⁴

Hypothesis K₂₃

The husband's religious activities are likely to be positively related to marital duration and wife's religiosity.

If this hypothesis is confirmed that could possibly mean that the longer a marriage survives, i.e., the larger T , the more G_j , spouse's religiosity, has an opportunity to influence h_{iT} , observed religious activities at time T . This would be evidence of a direct investment by spouses in their partner's skills and preferences. Alternatively, confirmation of the hypothesis could also reflect the longer duration of marriage between partners who selected each other for their similar characteristics.

Religiosity and Education. Another potential way to check whether spouse's G has a direct effect on individual behavior is to consider interactions between different types of G , in particular, education and religiosity. From a perspective of religiosity as human capital, it is expected that (1) own secular education could weaken own religiosity if it develops an alternative set of secular values, and (2) education of both spouses can enhance communication between spouses and consequently facilitate any direct spousal influence and in-marriage-learning. Effects (1) and (2) go in opposite directions. Effect (2) relates to the interaction between the two spouses' education and one spouse's religiosity, and is more likely to occur at high levels of both spouses' education, if communication on ideological matters requires a certain level of intellectual sophistication. If that is the case,

Hypothesis K₂₄

The relation between husband's observance and wife's religiosity is expected to be strongest amongst educated people.

Given effects (1) and (2), the relation posited in Hypothesis K₂₄ may not

be linear.

Data Analysis

The data for the present study were obtained from an unpublished survey of some 700 Jewish workers in Israel carried out by "Israel-Public Opinion Research Ltd." in June 1968. Respondents answered a battery of questions related to various areas of every day life, with an emphasis on religious activities. Information was also obtained regarding the socio-economic background of respondents, including age, number of children, schooling, family income, continent of birth and period of immigration.

For reasons mentioned above, we restricted our sample to men. In addition, we selected men defining themselves as either secular or traditional in order to increase the potential range of wife's influence on husband's religiosity.

The dependent variable is "time allocated to religious activity." This was measured by summing the estimated number of yearly hours devoted by respondents to each of a series of religious activities (see Neuman 1982, 1986). Means and variances are given in Table 15.1.

The independent variables include a dummy for wife being defined as religious (as opposed to secular or traditional), dummies concerning length of residence in Israel, and continent of origin.

Two independent variables are of particular interest to this study: duration of marriage and schooling. Duration of marriage and age were strongly correlated so we could not include them both simultaneously.⁵ Information on schooling was available only for the husband, but from other studies we know that wife's and husband's schooling are strong correlated (see Becker, 1981, for instance). The lack of information on spouse's education makes it even more likely that at higher levels of education the positive interaction between education and spouse's religiosity will tend to dominate the negative correlation between own education and own religiosity as reflected in the selection of a religious spouse. The more educated the husband, the more it is likely that the wife has the minimum level of education required for value communication, the basis of an in-marriage-learning effect.

Table 15.2 presents regressions of husband's religious practice. From

column 1 it can be seen that when the wife is defined as religious the husband spends significantly more hours practicing Judaism. The next three columns explore this relationship between wife's and husband's religiosity in an attempt to test Hypotheses K_{23} and K_{24} .

Columns 2 and 3 illustrate how a wife's religiosity possibly affects her husband's hours of practice as a function of the duration of marriage. Regression 2 shows that the entire effect of wife's religiosity depends on the duration of marriage: an interaction term of wife's religiosity and duration of marriage is highly significant, leaving wife's religiosity as a separate term without any explanatory power. The coefficient of duration of marriage is significantly positive, reflecting mainly the influence of age on religiosity.⁶

Regression 3 tells us more about the relationship between wife's and husband's religiosity and duration of marriage. Here we constructed three categories of marital duration. It can be seen that if a couple is married ten years or less the wife's religiosity is not significantly related to husband's religious practice. If the couple has been married for between eleven and twenty years a religious wife adds close to 80 annual hours to the husband's religious practice, the coefficient being statistically significant. (This is a large amount considering that the sample's average annual hours of religious practice stands at 121.) Even more impressive is the addition of 214 annual hours of practice if the wife is religious and the couple has been married over twenty years. This effect is considerably stronger than the separate effect of age. The findings in regressions 2 and 3 possibly confirm Hypothesis K_{23} . It does not necessarily prove that the investment-encouragement explanation is more applicable than the selectivity hypothesis, however, for reasons discussed above.

The results presented in regression 4 strengthen the in-marriage-learning explanation. Here we separate the effect of wife's religiosity by husband's (secular) education. It is found that the men whose religious observance is strongly correlated to marriage to a religious wife all belong to the more educated group with thirteen years of schooling or more. It is also possible that it is the wife who did the in-marriage-learning, and that her definition as "religious" results from being married to an observant Jew.

This finding stands out in light of the generally negative effect of own

schooling on husband's religiosity. In all regressions the coefficient of schooling is strongly negative. As pointed out by Neuman (1982) this can be the consequence of higher time costs since education and income are positively correlated and we did not have any information on income. Moreover, the negative coefficient of schooling could reflect secular-scientific views of the world which may conflict with a religious outlook. However, it can be seen from regression 4 that men married to a religious wife and having over 13 years of schooling spent more time practicing Jewish commandments than people with four years of schooling.

The presence of a religious wife thus overrides the negative impact of schooling. A possible explanation for this may be the readier means of communication between educated spouses--assuming the wife's education is strongly correlated to the husband's, as is usually the case--thus enabling influence on a spouse's religious practice.

Due to limited sample size, it was not practicable to create further interaction terms, taking account simultaneously of wife's religiosity, duration of marriage and husband's years of schooling.

Conclusions

This paper first addresses in general terms the relationship between individual behavior (including economic behavior), marriage, and religiosity. Traditional economics insufficiently explores the possible impact of marriage and marriage markets on individual behavior. Such deficiency results in part from ignoring processes of in-marriage-learning, the equivalent of On-the-Job-Training at the workplace. Another weakness of traditional economics lies in the insufficient attention it pays to attitudinal variables such as religiosity. This paper focuses on identifying possible evidence of in-marriage-learning of religiosity.

An analysis of Israeli Jewish couples indicates that spouses may teach each other some religiosity during marriage. There seems to be a long run process of religiosity formation, whereby a spouse trains or encourages a partner with limited initial skills, and more so, the more educated the couple. More research is necessary in order to disentangle this investment in human capital explanation presented here from an alternative explanation based on associative matching.

The significance of these results extends beyond the scope of religious studies, as similar processes on in-marriage-learning could teach spouses a variety of skills and attitudes, including ones that are more directly relevant to economic behavior.

Notes

1. This view of religiosity corresponds partially to Tomes' (1985) concept of religiosity as religious capital (see also Iannaccone 1990).
2. This model is simpler than the model presented in Chapter 3, in which a person chooses between three uses of time: work l , work in the home h , and time for self s , where work in the home benefits a spouse. Here h_i and s_i are aggregated.
3. Such skills and attributes are assumed to be at least in part of a "general" nature, which is why they can raise a person's wage or marital compensation (see Chapter 13).
4. Jewish men are commanded to observe many more time-consuming laws, such as prayer in the synagogue, phylacteries, etc. than are Jewish women.
5. This strong correlation is due to the classification of age at marriage into a small number of categories and the concentration of most respondents into the category of age at marriage in the early twenties.
6. Neuman (1982, 1986) discusses the effect of age on religious practice both at a theoretical and empirical level.