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# Religious Practice: A Human Capital Approach\*

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This study uses the economic concepts of household production and human capital to develop and test a new model of religious participation. The model explains observed patterns in denominational mobility, religious intermarriage, conversion ages, the relationship between church attendance and contributions, and the influence of upbringing and interfaith marriage on levels of religious participation.

## THEORETICAL BACKGROUND

The past few decades have seen major progress in the social scientific study of religion. The body of data on religious behavior has grown immensely; the statistical techniques and computing power needed to analyze these data have grown even more; and as a consequence, many of the basic facts of religious behavior have become known. Unfortunately, these empirical gains have not been matched by theoretical ones (Stark and Bainbridge 1987). If empirical research is to avoid diminishing returns, it must develop together with conceptual models general enough to account for a range of related behaviors and precise enough to meaningfully test.

The economic concepts of household production and human capital may provide the basis for such a model, one that explains observed patterns in denominational mobility, religious intermarriage, conversion ages, the relationship between church attendance and contributions, and the influence of upbringing and interfaith marriage on levels of religious participation. This paper (1) reviews how economists have used the concepts of household production and human capital, (2) develops a model of religious practice based upon these concepts, (3) derives the predictions that follow from the model, and (4) tests the predictions against observed behavior. The paper draws heavily from my unpublished dissertation (Iannaccone 1984).<sup>1</sup>

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## *Household Production and Human Capital*

The household production approach, sometimes called "the new home economics," was pioneered by Gary Becker in the early 1960s (Becker 1964, 1965; Becker and Michael 1973). Since then it has greatly expanded the boundaries of economics, enabling economists to analyze "nonmarket" behaviors traditionally deemed beyond their reach: fertility, education, marriage and divorce, health, discrimination, and even crime (Becker 1976; Hirschleifer 1985). Its central feature is that families are viewed as a quasi-firms engaged in the production of "household commodities." These commodities may be as concrete as meals and laundry or as abstract as relaxation and love. Unlike the products of a commercial firm, most household commodities are consumed by family members rather than being sold. But like the products of a firm, household commodities can only be produced with scarce resources; they require inputs of purchased goods, household labor, and human skill. For example, a traditional, home-cooked meal is produced when a family member combines purchased inputs (such as meat, milk, and flour), with machine services (of sink, stove, refrigerator), and his or her own skilled labor to produce a valued output, which is promptly consumed by family members. As this example suggests, a fair amount of household production is just a scaled-down version of market production. But the real strength of the household production approach lies in its applicability to abstract commodities such as recreational enjoyment, relaxation, health, and childrearing. So, for example, even though we can not quantify the relaxation and enjoyment that come from recreational activities, we may usefully speak of households "producing" this commodity by combining purchased inputs (such as ski equipment, automobile services, or VCR's, TV's, and stereos) with their own skilled labor and time.

Productive skills enter analyses of both commercial and household production because people's skills critically affect the quality and quantity of what they produce (Becker 1964, 1981). Such skills are just as important in childrearing and home maintenance as in construction and banking. Economists often refer to productivity enhancing skills as "human capital." They do so (1) because human skill and physical capital both are needed to turn raw labor and physical inputs into valued commodities, and (2) because people typically accumulate their skills through a process of investment (via education and practice) that parallels the investment that firms make in physical equipment. The importance of human capital is underscored by studies which find that economic progress in developing countries is more often constrained by work force inadequacies, such as low levels of health, education, and training, than by limited access to modern equipment and technology (Krueger 1968, Hogendorn 1987).

Human capital derives from a variety of sources: native ability, general education that contributes to one's productivity across the board, and so-called "specific" education or training that enhances the ability to perform specific tasks. Cooking skills provide a concrete example of each source: native ability may endow one with a fine palate or ability to memorize complex recipes; general education helps one to plan nutritious meals, buy wisely, and benefit from cook books; and specific training teaches one specific recipes, cooking techniques, and so forth. General education and specific skills likewise affect one's ability to produce abstract commodities such as recreation and childrearing. In the home as in the workplace, most general training is acquired through schooling, and most specific training is acquired "on the job" through experience, experimentation, and the imitation of others.

## *Religious Production and Religious Capital*

Religious practice can also be viewed as a productive process. Purchased goods, household time, and human capital affect a family's capacity to "produce" religious satisfaction just as they affect its capacity to produce meals, health, offspring, and recreational enjoyment. To be sure, religious products are complex and largely unobservable (though possibly no more so than recreational enjoyment). Nevertheless, the *inputs* to religious production are measurable and indeed are already routinely measured by researchers. These inputs include purchased goods, such as Sunday attire and transportation, sacrificial offerings, and money contributions which finance a church's operation and facilitate its charitable works. They also include family members' time and labor, such as time spent attending and traveling to and from church services, devotional time spent praying, meditating, and reading scriptures, and time and effort required for religious charity or other conduct motivated by religious concerns. Human capital, particularly human capital pertaining specifically to one's religion, comprises a third class of inputs. It is the input class most central to my analysis.

Although we are all familiar with the concept of a skilled clergy, we sometimes dismiss rank and file church members as passive consumers of religion. The household production approach reminds us that church members do not merely rely upon the skills of experts, but also invoke their own skills and experience to produce religious satisfaction. The skills and experience specific to one's religion includes religious knowledge, familiarity with church ritual and doctrine, and friendships with fellow worshipers. It is easy to see that these skills and experiences, which I will call *religious* human capital, are an important determinant of one's ability to produce and appreciate religious commodities. For example, the quality of fellowship experienced within a congregation depends strongly on what has been invested in these relationships, and over time this fellowship can become a major source of religious satisfaction and a major motive for continued participation (Hoge 1981; Olson 1988). Likewise, it is difficult if not impossible to appreciate religious services without first becoming familiar with the doctrines, rituals, and traditions that underpin them. It is also true that religious capital is an important product of religious activity. Many religious activities are explicitly "marketed" as a type of personal investment: religious services are designed not only to inspire or entertain the participants but also to instruct them; religious acts of charity and love are supposed not only to better the lot of others but also to better the actor as well; and in one way or another virtually every religion promises improved prospects in this life or the next.

These examples illustrate a fundamental interaction between religious capital and religious participation. Religious capital is both a prerequisite for and consequence of most religious activity. Religious capital -- familiarity with a religion's doctrines, rituals, traditions, and members -- enhances the satisfaction one receives from participation in that religion and so increases the likelihood and probable level of one's religious participation. Conversely, religious participation is the single most important means of augmenting one's stock of religious human capital. Religious activities yield a stock of specialized skills that enhances the satisfaction received from subsequent religious activities. In this last respect, religion is like many other household activities that involve learning by doing.

## APPLYING AND TESTING THE HUMAN CAPITAL MODEL

In religion as in economics the concepts of household production and human capital prove their value by generating testable predictions. Some of these predictions provide theoretical explanations for facts that are already well-known but not well-understood. Others suggest new lines of empirical research. The discussion below concerns predictions about denominational mobility, religious intermarriage, conversion, and religious participation. The purpose is to illustrate the value of an approach rather than to prove any particular hypothesis. Hence, the treatment of each subject is brief, limited to a statement of the model's predictions and a summary of the empirical evidence relating to them.

### *Denominational Mobility*

Religious training, unlike general education and occupational training, is received directly from parents and the religious institutions they support. Hence, children are more likely to remain within their parents' denominations than to remain within their parents' occupations. Most of children's religious human capital is built up in a context determined and favored by their parents. As children mature and decide for themselves what beliefs they will accept and what church they will attend, they naturally gravitate to those of their parents. And even those who do switch religions will tend to switch to religions that are similar to the one in which they were raised. Hence, the likelihood of conversion between particular religious groups should be greater the more similar the groups, and that overall rates of conversion to and from a particular group should be lower the more nearly unique the group.

*Empirical Evidence:* These predictions are confirmed by Kluegel's (1980) analysis of denominational mobility. Drawing on merged data from five years of NORC General Social Surveys, Kluegel cross-classified about six thousand white adult respondents by their current denomination and "background" denomination (in which they were raised) and analyzed the resulting matrix with log linear methods. Members of all denominations showed a strong tendency to maintain their background affiliation and this tendency was stronger in groups that have fewer close substitutes. The two most distinctive major religious groups in America, Jews and Catholics, had retention rates of 87% and 85% respectively. The less distinctive, Protestant denominations had lower retention rates, ranging from 78% for Lutherans to 55% for Disciples of Christ. And those raised with no religious affiliation, and hence little or no religious capital, remained unaffiliated only 38% of the time. Moreover, those who had changed religious affiliation manifested a clear affinity for denominations that were similar to their background denomination.<sup>2</sup> Similar patterns appear in Mueller's (1971) study of intergenerational religious mobility.<sup>3</sup>

### *Conversion Ages*

The human capital model predicts that religious switching, like job changes, will tend to occur early in the life-cycle as people search for the best match between their skills and the context in which they produce religious commodities. Over time the gains from further switching diminish as the potential improvement in matches diminishes and the remaining years in which to capitalize on that improvement decrease, whereas the costs of switching increase, as one accumulates more capital specific to a particular context. Conversions among older people should be very rare.

*Empirical Evidence:* These predictions are strongly confirmed by empirical studies. Three studies conducted about the turn of the century found that people made their first personal religious commitments at a mean age of 16 or 17 (Pressey and Kuhlen 1957). Apparently, these patterns have not changed much over time. A 1928 study of 1207 people found that religious "awakenings" usually began at age 12, but clear-cut conversion experiences occurred at a mean age of 16 (Clark 1929). And in 1954, the modal age of "converts" at Billy Graham crusades was 15 (Argyle and Beit-Hallahmi 1975). Not surprisingly, the typical religious commitment in all these studies was a personal affirmation of the religion in which the subject had been raised. Decisions to join a different church usually come later. For example, my own analysis of the 1964 and 1973 N.O.R.C. surveys of Catholic Americans found a modal age of conversion to Catholicism (among Catholic respondents raised in non-Catholic households) of 20 and a median age of 25 (figure 1). A similar pattern was observed in a study of 210 Catholic converts (Hoge 1981). The basic conclusion is clear: the decisions that lead to new religious commitments cluster in the early part of the life-cycle. Eleventh hour conversions of aging sinners preparing at last to meet their Maker are mostly mythical.

**[FIGURE 1 ABOUT HERE]**

### *Religious Inter-marriage*

A household can produce religious commodities more efficiently when both husband and wife share the same religion. Single-faith household benefit from "economies of scale." A single car drives everyone to church; there is no question as to how time and money contributions will be allocated over different religions; it is not necessary to debate the religion in which one's children will be raised. (The magnitude of these costs is underscored by Becker, Landes, and Michael [1977] and Schneider [1989], who find significantly higher rates of divorce for intermarried couples even when other traits are held constant.) Hence, the same forces that lead people to remain with the religion of their parents also lead them to choose mates from within their religion. Moreover, even those who do intermarry will have a strong incentive to later adopt the religion of their spouse (or vice versa). The efficiency gains from such marital realignments will tend to be greater when the less religious spouse converts to the religion of the more religious spouse.‡

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‡ Cut from the published version: Just as specific, context-attuned religious capital inhibits intergenerational mobility, so too it discourages religious intermarriage. As long as it is costly for different household members to worship in different contexts there will be an advantage to marrying "within one's faith." It is easy to think of reasons why worshiping, or even believing, differently should be costly: inputs such as transportation which would otherwise be jointly productive can only be used in a single context, parents now have to decide and possibly debate which context children will be raised in, spouses must decide on how money contributions are to be allocated between churches, and so forth.

To model religious intermarriage assume that husband and wife each have a religious human capital profile  $\{S_{@-(j)}(C)\}$  which is maximal at  $C^*$  and decreasing as  $|C_{@-(j)} - C^*|$  increases. For simplicity assume that both members of the household must engage in religious activities within the same context. Then, other things being equal, people would prefer marriage partners whose

*Empirical Evidence:* Empirical studies find patterns in religious intermarriage very similar to those of intergenerational religious mobility.<sup>4</sup> In particular, the tendency to marry within one's denomination is always very strong, *intramarriage* rates are higher in denominations with fewer close substitutes, and the *intermarriage* that does occur tends to be between people from relatively similar religions. These patterns have been identified in both Canadian and U.S. data (Travis 1976; Johnson 1980).<sup>56</sup>

### *Intermarriage and Participation*

Empirical studies consistently find rates of church attendance to be much higher among marriage partners sharing the same religion (Hoge and Roozen 1979). The reason for this finding, however, has been unclear, prompting Hoge and Roozen to remark that "a convincing explanation, if found in future research, would probably have far-reaching implications for understanding motivations for church participation today" (1979: 47).

The household production model provides such an explanation for shared-faith marriage's higher rates of church attendance. Partners of the same religion can produce religious commodities more efficiently. Their religious activities tend to be *complementary*, lowering the overall costs and raising the overall benefits of religious participation. In interfaith marriages, complementarity is replaced by competitive (or at best neutral) use of family resources. Since this argument applies to any religious activity that admits a sharing of partners' resources, we would also expect more contributions and perhaps even more prayer and Bible-reading in shared-faith marriages. On the other hand, a shared faith should have only indirect effect on individual belief.

*Empirical Evidence:* I have tested and confirmed these predictions with regression analysis of data from three surveys: NORC's 1963 and 1974 Catholic American Surveys (Greeley, McCreeley, and McCourt 1976); Glock and Stark's 1963 survey of Northern California church members (Glock and Stark 1966); and the 1978-1987 General Social Surveys. The regressions' dependent variables included household church contributions, the respondent's frequency of church attendance, prayer, and Bible reading. The list of independent variables, designed to control for a large number of exogenous effects, included the standard socio-economic and demographic variables as well as several religious background variables. Because the results tended to be so consistent from one survey to the next, I will present only a few of the regressions below. (A more extensive set of tables is available upon request.) Consider, for example, tables 1 and 2 which report results for

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religious capital is attuned to the same context as their own, since for any C in  $[C_{-(1)}, C_{-(2)}]$   $R(X, T_{-(1)}, T_{-(2)}, S_{-(1)}(C), S_{-(2)}(C))$  will increase as  $@_w[C_{-(1)} - C_{-(2)}]$  decreases. Indeed, it is also true that the optimal level of household religious commodity production and, if demand is elastic, the optimal level of religious participation will decline as spouse's religious differences  $@_w(|C_{-(1)} - C_{-(2)}|)$  increase since partners with less similar religious backgrounds will find religious commodities most costly to produce. However, the mere observation that couples from different religious backgrounds tend to be less religiously active than couples from the same background is not a proof of this assertion, since people with higher past levels of participation, and hence higher S profiles, will have a stronger incentive too marry within their religion. This leads to a selection bias when intermarried couples are compared to intramarried.

married respondents in the 1974 American Catholic survey and 1963 Northern California Church Member survey. The variable MARSAME is a dummy variable that equals one if both respondent and spouse were of the same denomination and zero otherwise. Hence, its coefficient equals the effect that a shared faith has on religious participation after controlling for all the other variables in the regression. As predicted, the effect is large, positive, and significant throughout. In the first two columns of table 1, MARSAME increases family contributions by 71 dollars per year (relative to a mean of \$193) and increases the (Catholic) respondent's frequency of mass attendance by 11.8 services per year (relative to a mean of 39). In table 2, the corresponding effects are 86 dollars per year and 9.2 services per year.

**[TABLES 1 AND 2 ABOUT HERE]**

There is, however, an alternative explanation for these results that has more to do with sample selection bias than production efficiency. People who are more serious about their religion, and so more likely to participate in it, may well be more likely to marry in their faith. If much of this sorting goes on, members of shared-faith marriages will average higher rates of religious participation than their interfaith counterparts *even if marriage itself has no impact on an individual person's participation*. Although the household production model predicts some sorting (since people desiring high levels of religious participation gain more than others from a shared-faith marriage), the model also predicts higher rates of participation in shared-faith marriages *even if no sorting occurred*. Stated differently, the model predicts that members of shared-faith marriages will not only participate more than members of inter-faith marriages, but also more than they themselves would have had they remained single. Hence, we can empirically measure the relative importance of pure sorting versus pure efficiency effects by comparing religious participation rates among single, interfaith, and shared-faith respondents. Under pure sorting, average participation rates for single people should equal those of married people as a whole, with interfaith marriages averaging less and shared-faith marriages averaging more. Under pure efficiency, average participation rates for single people should be less than those of married people as a whole, with interfaith marriages averaging about the same and shared-faith marriages averaging more.<sup>7</sup>

**[TABLES 3 AND 4 ABOUT HERE]**

The results in tables 3 and 4 indicate that production efficiency has an impact that is independent of and stronger than the impact of sorting alone. The sample includes both married and single General Social Survey respondents between the ages of 18 and 43.<sup>8</sup> The two independent variables of key interest are, MARRIED, which equals 1 if the respondent was married, and MARSAME, which equals 1 if the respondent has a spouse of the same denomination. The remaining independent variables merely control for other effects. Since MARRIED and MARSAME must both equal zero when the respondent is single, the participation rates of single people form the baseline for the regressions. The regression coefficient for MARRIED equals the difference between the participation rates of *interfaith* married respondents and single respondents. The sum of the regression coefficients for MARRIED and MARSAME equals the difference between the participation rates of *shared-faith* married respondents and single respondents. Note that for every measure of religious *participation* -- attendance, contributions, and prayer -- interfaith, married respondents participate only slightly (and never significantly) less than single respondents, whereas shared-faith, married respondents participate substantially (and significantly) more than single

respondents. On the other hand, in regressions measuring belief (in the Bible and in an afterlife) all effects are insignificant. Both these sets of results are consistent with the "efficiency" model but contradict the pure "sorting" model.

### *Religious Upbringing*

Since religious capital is accumulated largely as a by-product of religious participation, and since religious capital provides an incentive for further religious participation, the household production model predicts that people's adult rates of religious participation will be strongly correlated with their childhood religious participation and training.

*Empirical Evidence:* It comes as no surprise that strong religious upbringing is a "leading indicator" of adult religious participation. Nevertheless, it is worth noting that the regressions in tables 1 through 4 support this prediction as well. In the 1974 Catholic American survey (table 1), both childhood religious instruction and parents' frequency of mass attendance (while the respondent was growing up) have positive effects on the respondents' current contributions and mass attendance. The effect of childhood religious instruction is also positive in the 1963 Church Member study (table 2) which did not include information on parental church attendance. And the effect of parental church attendance is again positive in the General Social Surveys (table 3) which do not include information on childhood religious instruction.

### *Time Versus Money*

The concept of "input substitution" underpins many of the most distinctive and important predictions of household production theory. Virtually all production processes, whether household or commercial, require both purchased inputs and labor inputs. But the *ratio* of these inputs can often be varied. Home cooked meals and restaurant meals can be equally good (or bad), but the former require much greater inputs of household time relative to purchased goods. In like manner, lawns can be watered by hand or by automated sprinklers, trips can be taken by bus or by plane, and children can be cared for by parents or preschools. In each of these cases, the efficient method of production will depend on the monetary value of the household's time. The higher the value of time, the more likely it is that the household will substitute time-saving, "money-intensive" forms of production for money-saving, "time-intensive" forms. Hence, it comes as no surprise that people with high wage rates are more likely to dine out, install sprinklers, take planes, and have children in preschools.

Applied to religion the concept of input substitution yields a uniquely economic prediction: people with high monetary values of time will conserve on their time by engaging in money-intensive religious practices. In particular, their money contributions will be high relative to their rates of attendance and vice versa. People with low monetary values of time will adopt more time-intensive practices and so do the opposite. These predictions provide a strong test of the proposed model since they have no precedent within traditional models of religious participation.

*Empirical Evidence:* The three surveys discussed above support the prediction that religious participation is more "money-intensive" among people with high values of time. The regressions in the third columns of tables 1, 2, and 3 show that income is one of the strongest predictors of the ratio of attendance to contributions. As people become richer, they contribute more dollars per

service attended and, conversely, attend less per dollar contributed. Hence, higher income leads to participation that is more money-intensive and less time-intensive. This finding must be kept in proper perspective, however. People's participation in religious activities becomes less time-intensive (and hence more money-intensive) whenever their time inputs decrease *relative* to their money inputs. But this relative decrease need not be accompanied by a decrease in the *absolute* amount of time devoted to religious activity. So, for example, the attendance regressions in tables 1, 2, 3 show that income has a positive, albeit statistically insignificant, effect on absolute levels of attendance. In other words, the attendance/contribution ratio decreases simply because contributions have increased much more rapidly than attendance. This leads one to ask whether the concept of substitution between time and money really has relevance. Might not the regression results could simply reflect people allocating to religion a fixed fraction of their time (e.g, one morning per week) and a fixed fraction of their income (e.g., 5 percent per year)?

Figures 2 and 3 help to distinguish between these two competing interpretations by providing a different view of the data. Figure 2 plots respondents' average rates of contributions and church attendance as a function of their ages. Notice that attendance and contributions are in no sense static over the the life cycle -- people do not merely allocate a fixed fraction of their time to religion, nor do they merely allocate a fixed fraction of their income. Attendance displays a strong, albeit somewhat irregular, upward trend.<sup>9</sup> Contributions increase steadily and far more rapidly than income between ages 20 and 40, and thereafter trend irregularly downward. Despite these trends and irregularities, the average *ratio* of attendance to contributions (plotted in figure 3) reveals a life-cycle pattern that is both regular and consistent with the household production model: compared to people in their prime-earning, middle years, the young and the old attend more relative to each dollar they contribute.<sup>10</sup> Conversely, the age groups with the highest monetary values of time contribute the greatest number of dollars per hour of church attendance.

### [FIGURES 2 AND 3 ABOUT HERE]

In short, the observed effects across both age groups and income strata are quite consistent with the conjecture that people substitute money for time in the production of religious commodities. However, better data are needed to get beyond mere consistency. I will comment briefly on kinds of data that I have in mind, starting with information on individual respondents and then proceeding to households and congregations.

(1) Individuals: Results like those reported above would benefit from more precise economic information and more detailed information about religious activities. Economists stress that household income constitutes a very crude measure of an individual's monetary value of time. Far better measures result when the respondent's own wage rate and hours of work are distinguished from nonlabor income and the earnings of other family members. Likewise, overall levels of church attendance and contributions convey little information about substitution between time and money. Much more could be inferred using information on how time and money are allocated among specific religious and secular activities. (Given the growing number of "time budget" studies being conducted by social scientists, this information may soon be available.)

(2) Households: Research on the economics of the family reveals a fair amount of "input substitution" among family members (Becker 1981). That is, family members with relatively high

values of time often contribute much of their earnings but little of their own time to various household activities while other members, with lower values of time and/or fewer hours of employment, do the opposite. Some economists have suggested that a similar division of labor applies to the family's religious activities. In particular, they have argued that traditional differences in wages and rates of employment help explain why women attend church more frequently than men (Azzi and Ehrenberg 1975; Ehrenberg 1977). Others disagree (Long and Settle 1977; Ulbrich and Wallace 1984). The issue will probably remain unsettled until we obtain more joint data on husbands and wives that detail the religious activities and work status of each.

(3) Congregations: Congregational studies should provide additional evidence regarding substitution between religious time and money. For example one might inventory congregations to see whether richer congregations consistently opt for time-saving, money-intensive, practices. Examples of these might include shorter services, more reliance on professional staff -- clergy, custodians, choir directors, paid soloists, etc. -- larger and more costly facilities (permitting less use of members' homes for special meetings), more reliance on purchased goods and services and less reliance on volunteered labor (e.g., catered meals in place of pot-lucks). Anecdotal accounts would suggest that these practices are in fact more prevalent among richer congregations. A careful, comparative study is needed to determine whether the anecdotes reflect a broad, overall pattern.<sup>§</sup>

## CONCLUSION

The economic concepts of household production and human capital generate a powerful model of religious participation. Although the model side-steps questions about what religion "really" is, it nevertheless illuminates a great many issues: denominational mobility, religious intermarriage, the timing of conversions, the influence of religious upbringing, the ratio of attendance to contributions, and the impact of interfaith marriage.<sup>11</sup>

In each case, the model's predictions receive strong empirical support. Conversions are concentrated in the early stages of the life cycle, as people search for the best match between their religious skills and the context in which they produce religious commodities. Religious mobility, like career mobility, becomes progressively less likely as people age. Moreover, it is not just the timing but also the patterns of mobility that fit the model's predictions. People switch denominations in ways that preserve the value of their religious human capital. Rates of intergenerational mobility

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<sup>§</sup> Cut from the published version: Since religious activity is both cause and consequence of religious human capital, religious participation will tend to increase with age. As time passes people's stock of religious capital tends to grow. Since this stock of capital complements participation, participation therefore will tend to grow as well. On the other hand the *rate* of growth should tend to diminish with age, as both the stock of capital and level of participation approach a long-run steady-state.

In the General Social Survey data, older people clearly attend church more often than younger people. The trend is not uniform, but it definitely significant overall. Other researchers have also observed this effect, and the general consensus is that is not merely a cohort effect, but rather is truly related to aging.

tend to be low, particularly for people raised in distinctive religious traditions, and the switching that does occur tends to be among similar denominations. Religious intermarriage displays similar patterns. People seek out partners whose religious human capital complements their own, and the productive efficiency inherent in shared-faith marriages leads to higher levels of church attendance and contributions. Religious upbringing, probably the most important source of religious human capital, is a major determinant of religious belief and behavior. Finally, there is evidence, albeit inconclusive, that money and time substitute for one another in the production of religious commodities. People with high monetary values of time display higher ratios of contributions to attendance, suggesting that they engage in more "money-intensive" forms of religious activity.

None of these findings is, by itself, very surprising. What is surprising, however, is that so many different findings emerge as predictions of a single model. The concepts of household production and human capital deserve researchers' attention precisely because they explain so much of what we already know about religious participation. They also deserve attention because they raise new empirical questions, such as those concerning the substitution of money for time. Indeed, the human capital approach to religious participation illustrates the threefold contribution of economic theory to the scientific study of religion: integrating numerous predictions within a single conceptual framework; providing theoretical explanations for observed empirical regularities; and generating new hypotheses to guide future empirical research.

## Notes

<sup>1</sup> The dissertation, in turn, builds on Stigler and Becker's (1977) discussion of "consumption capital" and "rational addiction." Recently, Andrew Greeley (1989: 122 - 125) has also invoked these concepts to explain intergenerational stability of religious choice.

<sup>2</sup> Mobility was limited by three lines of cleavage. Foremost was the Christian-Jewish cleavage. Individuals from Christian backgrounds were much more likely to switch to another Christian group than to become Jewish. Next in importance was the Catholic-Protestant cleavage. Finally, mobility among Protestant Christians denominations manifested significant patterns of affinity and aversion based on theology, history, and geographical concentration.

<sup>3</sup> Mueller applied a factor analytic technique to data from a national study designed by Glock and Stark and conducted by the National Opinion Research Center. Respondents were cross classified according to their current religious affiliation and that of their father when they were growing up. There was, of course, a strong tendency for children to be of the same religion as their parents. But changes in denomination, when they did occur, revealed four underlying dimensions of denominational similarity. In order of importance, these were: (1) a Protestant-Catholic cleavage; (2) a dimension of "accessibility," which reflected both socioeconomic similarities and geographic concentrations; (3) a high-low liturgical dimension; and (4) a dimension of theological orthodoxy.

<sup>4</sup> This is to be expected, since most intergenerational mobility is due to one spouse adopting the religious affiliation of the other.

<sup>5</sup> The Bureau of Canadian Statistics keeps record of the religious affiliation of brides and grooms married each year in Canada. The data are published in frequency tables, cross classified by denomination of groom and bride, in the *Canada Year Book*. Using log linear methods Travis analyzes patterns of Canadian religious intermarriage for the years 1934 through 1969. Throughout the period there was a strong and significant tendency for people to marry within their religious grouping. Moreover, "the denominations could be clustered into groups within which homogamy was roughly of the same order. From high to low, they were (1) Jews, (2) Mennonites, (3) Greek Orthodox, Ukrainian Catholics, and Pentecostals, (4) Roman Catholics, Baptists, Presbyterians, Lutherans, and 'Other,' and (5) Anglicans and United Church of Canada." The intramarriage rates ranged from nearly 90% among Jews to less than 50% among members of the United Church of Canada. (Log linear methods adjust these rates to take account of the differences in group sizes.) Evidently, the more nearly unique the religion the greater the propensity toward endogamy.

Among those who married out of their religious grouping there were highly significant patterns of religious intermarriage. These may be interpreted as reflecting a tendency for persons to intermarry in such a way as to preserve similarities along some underlying dimensions of denominational attributes. Travis notes that "[i]f one were to know the year in which a marriage partner were married, his or her religious denomination, and the fact that a heterogeneous marriage was formed, then one could predict the denomination of the spouse and never be in error more than 12 percent of the time" (1976: 66). In particular, "almost two thirds of the interdenominational variance of marriages was due to the association between the three Catholic groups, Roman Catholics, Greek Orthodox, and Ukrainian Catholics" (1976: 69). Applying Brown's (1974) method for the analysis of two-way contingency tables to this same data, I have also found evidence of affinities among liberal Protestants (Presbyterian, Anglican, and United Church of Canada) and conservative Protestants (Baptists, Sect members, and Lutherans). Multidimensional scaling seems to indicate that the underlying dimensions of affinities and dissimilarities are: (1) a Jewish-Christian cleavage, (2) a Protestant-Catholic cleavage, (3) a liberal-conservative dimension of doctrinal orthodoxy, and (4) a high-low dimension of ritualism and liturgy.

<sup>6</sup> Johnson (1980) uses log linear methods to study religious assortative marriage in the United States. His data are derived from three sets of cross sectional surveys: the 1973, 1974, 1975, and 1976 NORC General Social Surveys; the 1960 Growth of American Families survey; and the 1958, 1959, and 1966 Detroit Area Study surveys of the University of Michigan. Analyzing the religious origins of nearly 7,000 married couples, Johnson, like Travis, finds that the tendency to in-marry is always strong but varies significantly from one denomination to the next. There are also significant patterns in religious intermarriage. The patterns seem to identify a simple, linear ordering of Christian denominations: (1) Baptists and other fundamentalists; (2) Methodists; (3) Presbyterians, Congregationalists, and Episcopalians; (4) Lutherans; and (5) Catholics. ("Others"--Jews, Quakers, members of the Eastern Orthodox church, persons with no religious preference, etc., were treated as a separate category.) However, it is quite possible that a finer taxonomy which segregated individuals into more than six categories would have revealed more than one dimension of religious differences. Although Johnson does not attempt to demonstrate the reason for this ordering, he notes that it may reflect "cognitive distance," or "Low Church-High Church" ritualistic differences, or "regional loyalties, prejudices, or ties." (1980: 81-82.)

<sup>7</sup> The test could be invalidated if other unobserved factors affect the relative participation rates of married and unmarried people, e.g. if older people participate more and married people tend to be older than single people. However, the likelihood of this problem is minimized by including a large number of controls (such as age) in the regressions.

<sup>8</sup> Since church participation and the probability of being married both tend to rise with age, the age restriction was imposed to reduce the likelihood of confounding these effects. Age group dummies were included among the independent variables for the same reason.

<sup>9</sup> For the purpose of my analysis it does not matter whether the observed increase is due to age, period, or cohort effects. Nevertheless, studies suggest that most of the observed trend is in fact related to age (Argyle and Beit-Hallahmi 1975, Roozen 1980, Hout and Greeley 1987).

<sup>10</sup> Note, in particular, that attendance/contributions ratio is nearly the same for people in their 30's and 60's, despite the fact that the latter attend twice as frequently as the former.

<sup>11</sup> Such side-stepping is quite common and arguably beneficial in economic discourse, since it facilitates the construction and application of abstract theories. For example, agricultural economists rarely worry about the essential characteristics of apples or why people enjoy eating them. Yet, by studying the external forces that govern the supply of and demand for apples -- weather, price, income, and familiarity with the product, and so forth -- they generate valuable insights and information.

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**TABLE 1:**  
**PARTICIPATION REGRESSIONS, 1974 CATHOLIC SURVEY**

| Variable   | CONTRIBUTE |        | ATTEND    |        | RATIO (A/C) |        |
|------------|------------|--------|-----------|--------|-------------|--------|
|            | coeff      | t-stat | coeff     | t-stat | coeff       | t-stat |
| MARSAME    | 70.984***  | 4.60   | 11.836*** | 5.25   | -0.105**    | -2.64  |
| RLGINSTR   | 3.313*     | 2.14   | 0.509*    | 2.25   | -.000149    | -0.04  |
| PCHURCH    | 0.512      | 1.63   | 0.219***  | 4.80   | .000909     | 1.19   |
| NOINCOME   | 172.257*** | 3.58   | 6.199     | 0.88   | -0.425***   | -3.30  |
| INCOME     | 9.025***   | 9.73   | 0.019     | 0.14   | -0.034***   | -4.53  |
| HEDUC      | 4.124      | 1.75   | 0.231     | 0.67   | -0.007      | -1.35  |
| AGE        | 3.702***   | 7.66   | 0.316***  | 4.47   | -0.018*     | -2.47  |
| SEX        | -0.912     | -0.07  | 7.232***  | 4.13   | 0.103***    | 3.70   |
| NONWHITE   | -36.259    | -1.83  | -0.723    | -0.25  | 0.252***    | 5.34   |
| NKIDS      | 4.646      | 1.17   | -0.020    | -0.03  | -0.023*     | -2.38  |
| BELIEF     | 35.256**   | 2.96   | 12.591*** | 7.23   | 0.039       | 1.40   |
| NBHD       | -25.373    | -0.95  | -2.725    | -0.69  | -0.035      | -0.56  |
| RAISECA    | -5.044     | -0.12  | -1.068    | -0.18  | -0.036      | -0.37  |
| PCATH      | -64.239    | -1.62  | -11.243*  | -1.94  | 0.025       | 0.26   |
| (CONSTANT) | -194.256   | -4.02  | 4.122     | 0.58   | 1.276       | 7.64   |
| R-squared  | .39        |        | .28       |        | .31         |        |
| Cases      | 555        |        | 555       |        | 456         |        |

**NOTES.**

Source: N.O.R.C. American Catholic Survey, 1974

Sample: All married respondents Variable definitions:

AGE = respondent's age, ATTEND = yearly number of masses attended.

BELIEF = 9-item additive scale of respondent's strength of religious belief.

CONTRIB = yearly contributions to church (excluding Catholic school tuition and contributions).

HEDUC = years of education of family head

INCOME = yearly income (thousands).

MARSAME = equals 1 if respondent and spouse of same religion,

NBHD = fraction of neighbors catholic when growing up

NKIDS = number of preschool or school-age children,

NOINCOME = dummy (1 if income not reported, 0 otherwise),

NONWHITE = dummy (1 if respondent is nonwhite, 0 otherwise),

PCATH = dummy (1 if either parent catholic, 0 otherwise),

PCHURCH = mean of parents' yearly mass attendance,

RAISECA = dummy (1 if respondent was raised a catholic, 0 otherwise),

RATIO = time intensity of religious participation--ATTEND/CONTRIB,

RLGINSTR = respondent's religious instruction scale score

SEX = sex of respondent--1 if female, 0 if male

**TABLE 2:**  
**PARTICIPATION REGRESSIONS, 1963 NORTHERN CALIFORNIA SURVEY**

| Variable   | CONTRIBUTE  |        | ATTEND    |        | RATIO (A/C) |        |
|------------|-------------|--------|-----------|--------|-------------|--------|
|            | coeff       | t-stat | coeff     | t-stat | coeff       | t-stat |
| MARSAME    | 86.530***   | 8.36   | 2.144**   | 2.73   | -0.074***   | -5.61  |
| RLGINSTR   | 5.465**     | 2.62   | 0.340*    | 2.15   | -0.002      | -1.09  |
| NOINCOME   | -81.633***  | -3.68  | -1.917    | -1.14  | 0.044       | 1.56   |
| INCOME     | 23.630***   | 17.82  | 0.064     | 0.64   | -0.062***   | -7.49  |
| REDUC      | 3.446       | 1.93   | 0.654***  | 4.84   | .000528     | 0.23   |
| AGE        | 1.788***    | 4.28   | 0.159***  | 5.04   | -0.002***   | -3.88  |
| SEX        | -32.642***  | -3.59  | 1.386*    | 2.01   | 0.036***    | 3.11   |
| NKIDS      | -0.492      | -0.14  | 0.805***  | 3.16   | 0.003       | 0.87   |
| BELIEF     | 71.000***   | 8.18   | 9.136***  | 13.87  | 0.019       | 1.76   |
| EXPERIENCE | 54.393***   | 7.55   | 3.198***  | 5.85   | -0.004      | -0.51  |
| SICKTIME   | -2.802      | -1.71  | -0.522*** | -4.21  | 0.003       | 1.53   |
| LIBERAL    | -58.537***  | -5.26  | -0.606    | -0.71  | 0.027       | 1.91   |
| CONSERV    | 33.505      | 1.90   | -0.181    | -0.13  | -0.020      | -0.88  |
| CATHOLIC   | -191.861*** | -14.33 | 2.240*    | 2.20   | 0.234***    | 13.64  |
| (CONSTANT) | -63.597     | -1.74  | 19.101    | 6.91   | 0.701       | 11.10  |
| R-squared  | .33         |        | .24       |        | .21         |        |
| Cases      | 2186        |        | 2186      |        | 2186        |        |

**NOTES.**

Source: 1963 Northern California Church Member Study

Sample: All married respondents

Variable definitions:

AGE = respondent's age.

ATTEND = yearly number of masses attended.

BELIEF = 9-item Z-scale of respondent's strength of religious belief.

CONTRIB = yearly contributions to church.

EXPERIENCE = 3-item Z-scale of respondent's religious experiences.

INCOME = yearly income (thousands).

LIBERAL, CONSERV, CATHOLIC = denominational dummy variables.

MARSAME = equals 1 if respondent and spouse of same religion.

NKIDS = number of preschool or school-age children.

NOINCOME = dummy (1 if income not reported, 0 otherwise).

RATIO = time intensity of religious participation, ATTEND/CONTRIB.

REDUC = respondent's years of education.

RLGINSTR = respondent's religious instruction scale score.

SEX = sex of respondent--1 if female, 0 if male.

SICKTIME = respondent's number of sick days in last year.

**TABLE 3:**  
**RELIGIOUS PARTICIPATION, GENERAL SOCIAL SURVEYS**

|            | ATTEND    |        | CONTRIBUTE  |        | RATIO (A/C) |        |
|------------|-----------|--------|-------------|--------|-------------|--------|
|            | coeff     | t-stat | coeff       | t-stat | coeff       | t-stat |
| MARRIED    | -3.888    | -1.32  | -170.851    | -.97   | .002        | .00    |
| MARSAME    | 17.032*** | 11.29  | 352.056***  | 3.93   | -.149       | -1.21  |
| MAATTEND   | .140***   | 5.40   | NA          | NA     | NA          | NA     |
| PAATTEND   | .110***   | 4.32   | NA          | NA     | NA          | NA     |
| AGE20      | 1.591     | .79    | -87.751     | -.74   | .708***     | 4.34   |
| AGE30      | .166      | .10    | -167.148    | -1.71  | -.043       | -.32   |
| AGE35      | 3.684*    | 2.16   | -247.96*    | -2.45  | -.014       | -.10   |
| AGE40      | 4.689*    | 2.45   | 31.313      | .27    | -.066       | -.42   |
| SEX        | 5.278*    | 2.47   | 77.833      | .61    | -.107       | -.62   |
| EDUC       | 1.143***  | 4.65   | 34.576*     | 2.40   | .008        | .44    |
| INCOME     | .072      | 1.19   | 2.032       | .56    | -.009*      | -2.00  |
| MARSEX     | .253      | .09    | -140.653    | -.92   | .257        | 1.23   |
| MARINC     | -.074     | -1.01  | 9.820*      | 2.24   | .004        | .69    |
| MODERATE   | 8.223***  | 4.35   | 118.281     | 1.06   | -.049       | -.32   |
| NOBAPT     | 8.686*    | 2.49   | 68.227      | .33    | -.030       | -.10   |
| SOBAPT     | 14.606*** | 5.40   | -7.338      | -.04   | .144        | .66    |
| CONSERV    | 13.118*** | 4.85   | 467.617**   | 2.94   | -.015       | -.07   |
| SECT       | 34.691*** | 13.84  | 399.277**   | 2.76   | .097        | .49    |
| MORMON     | 22.935*** | 6.38   | 1494.057*** | 7.02   | -.069       | -.23   |
| CATHOLIC   | 10.686*** | 6.48   | -17.645     | -.18   | .275*       | 2.08   |
| (Constant) | -21.131   | -5.05  | -430.765    | -1.74  | .168        | .50    |
| R-squared  | .277      |        | .252        |        | .126        |        |
| Cases      | 1963      |        | 495         |        | 339         |        |

*NOTES.*

Source: General Social Surveys, 1983 - 1987.

Sample: All non-whites, aged 45 or younger, currently married or never married.

Variable definitions:

AGE20, AGE25, AGE30, AGE35, AGE40, dummy variables equal to 1 or 0 depending on respondent's age rounds to the nearest 5 years; ATTEND (mean = 23.6), average number of religious services that respondent attends each year including both week-end and weekday services; CONTRIBUTE (mean = \$376), household's contribution in 1986 dollars; EDUC (mean = 13.2), respondent's highest year of school completed; INCOME, Household's 1986-real income (thousands); MARRIED, equals 1 if respondent is currently married; MARSAME, equals 1 if respondent has spouse of same religion; MAATTEND, PAATTEND, respondent's parents' frequency of church attendance. These items were not included in the survey which asked about contributions; MARSEX, MARINC interaction dummies = MARRIED x SEX and MARRIED x INCOME, respectively; MODERATE, CONSERV, SECT, MORMON, CATHOLIC, SOBAPT (Southern Baptist), NOBAPT (Baptist, Non-Southern), denominational dummy variables; RATIO = time intensity of religious participation, ATTEND/CONTRIB; SEX, equals 1 is respondent is female.

**TABLE 4:**  
**PRAYER AND BELIEF, GENERAL SOCIAL SURVEYS**

|            | PRAY     |        | AFTERLIFE |        | BIBLE    |        |
|------------|----------|--------|-----------|--------|----------|--------|
|            | coeff    | t-stat | coeff     | t-stat | coeff    | t-stat |
| MARRIED    | -.547    | -.64   | .046      | .90    | .184     | 1.39   |
| MARSAME    | 2.238*** | 5.15   | .018      | .69    | .010     | .15    |
| MAATTEND   | .027***  | 3.68   | .001**    | 2.83   | .001     | 1.13   |
| PAATTEND   | .008     | 1.12   | .00063    | 1.41   | .001     | 1.16   |
| AGE20      | -.551    | -.95   | -.026     | -.75   | .034     | .37    |
| AGE30      | .279     | .59    | -.014     | -.50   | -.050    | -.68   |
| AGE35      | .870     | 1.77   | -.011     | -.37   | .001     | .01    |
| AGE40      | 1.556**  | 2.82   | -.036     | -1.08  | .012     | .14    |
| SEX        | 1.668**  | 2.71   | .042      | 1.13   | .089     | .93    |
| EDUC       | .128     | 1.82   | .004      | .98    | -.057*** | -5.21  |
| INCOME     | -.012    | -.70   | .001      | 1.31   | .001     | .37    |
| MARSEX     | 1.240    | 1.68   | .011      | .25    | .056     | .48    |
| MARINC     | -.014    | -.66   | -.001     | -.90   | -.003    | -1.16  |
| MODERATE   | 1.913*** | 3.51   | .146***   | 4.45   | .427***  | 5.02   |
| NOBAPT     | .890     | .88    | .166**    | 2.73   | .269     | 1.71   |
| SOBAPT     | 2.101**  | 2.69   | .193***   | 4.11   | .398***  | 3.27   |
| CONSERV    | 3.485*** | 4.47   | .209***   | 4.44   | .784***  | 6.44   |
| SECT       | 5.367*** | 7.42   | .121**    | 2.77   | .567***  | 5.01   |
| MORMON     | 5.958*** | 5.75   | .277***   | 4.42   | .328*    | 2.02   |
| CATHOLIC   | 1.299**  | 2.73   | .126***   | 4.40   | .205**   | 2.76   |
| (Constant) | -.392    | -.32   | .496      | 20.63  | .365     | 8.67   |
| R-Square   | .17      |        | .07       |        | .24      |        |
| Cases      | 1567     |        | 1448      |        | 536      |        |

**NOTES.**

Source: General Social Surveys, 1983 - 1987.

Sample: All non-whites, aged 45 or younger, currently married or never married.

Variable definitions:

AFTERLIFE, equals 1 if respondent believes in an afterlife, 0 otherwise; AGE20, AGE25, AGE30, AGE35, AGE40, dummy variables equal to 1 or 0 depending on respondent's age rounds to the nearest 5 years; BIBLE, equals 1 if respondent believes the Bible is the literal word of God, 0 otherwise; EDUC (mean = 13.2), respondent's highest year of school completed; INCOME, Household's 1986-real income (thousands); MAATTEND, PAATTEND, respondent's parents' frequency of church attendance. These items were not included in the survey which asked about contributions; MARRIED, equals 1 if respondent is currently married; MARSAME, equals 1 if respondent has spouse of same religion; MARSEX, MARINC interaction dummies = MARRIED x SEX and MARRIED x INCOME, respectively; MODERATE, CONSERV, SECT, MORMON, CATHOLIC, SOBAPT (Southern Baptist), NOBAPT (Baptist, Non-Southern), denominational dummy variables; PRAY, respondent's frequency of prayer per week; SEX, equals 1 is respondent is female.