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The Economics of Misbehavior, Love, and
Marriage Contract Enforcement

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ABSTRACT

Individuals allocate time between production of goods shared by family members and goods consumed only by the individual. Individuals are inclined to misbehave by giving less time to production of shared goods than is preferred by the family. In some cultures, strict family control reduces misbehavior. Marriage for love is an innovation in marriage contract enforcement adopted by cultures with specific characteristics. Analysis of cultures in the Human Relations Area Files supports the theory.

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I. Introduction

Traditional economic theory treats families as a single unit with a combined "household" utility function. More recently, economists have recognized that a family can usefully be described by assuming each member maximizes an individual utility function.

The seminal contributor to the economic theory of the family is Becker (1973, 1974, 1981). Becker exploits the notion that individuals can produce and consume more when married than when single. Becker then shows how the sorting of mates to achieve this increased consumption can be modeled as a market.

Other authors extend Becker's research. Peters (1986) looks at factors affecting the costs and benefits of divorce. Johnson and Skinner (1986) analyze changes in female U.S. labor force participation rates. Boulier and Rosenzweig (1984) examine U.S. statistics on education, length of life, and other factors influencing marriage and household behavior. Grossbard-Shechtman (1984) models supply and demand for husbands and wives and predicts cultural differences in bridewealth, dowry, age at marriage, and labor force participation. Pollak (1985) likens marriage to the merger of firms and explores the role of transactions costs in family production.

Some researchers apply game theory to marriage. Manser and Brown (1980) and McElroy and Horney (1981) treat

marriage as a two-person cooperative game where spouses allocate time between private goods, shared goods, and leisure. Roth (1984) models mate search, concluding that individuals do not gain from misrepresenting themselves.

Both anthropology and sociology possess substantial and mature literatures on marriage. Some researchers from these disciplines view marriage in a manner akin to the later economists. Blau (1964) introduces the idea that mutual exchange is the basis for all social interaction, including marriage. In a classic cross-cultural analysis, Levi-Strauss (1969) shows how the exchange of wives and valuable assets cements kinship ties. Goody and Tambiah (1973) compile cultural information on bridewealth and dowry. Goody (1976) uses the cultural data in the Ethnographic Atlas to test hypotheses about family behavior.

II. A Model of Family Allocation of Time

The economic theory of marriage introduced by Becker assumes individuals can devote a fixed vector of inputs to production of household goods inside a marriage or can remain single and devote the same fixed vector of inputs to production of household goods outside a marriage. Individuals marry because the vector of inputs yields more joint output in a marriage than the sum of individual outputs when single. This output includes "products" like companionship and the joys of children. Enforcement of an explicit or implicit marriage contract is unimportant in

Becker's theory since spouses are assumed to maximize joint product and make transfers within the family to provide appropriate compensation.

The model presented in this paper departs from previous work by allowing individuals in a marriage to allocate time between production of own goods and production of household goods. Individuals do not automatically maximize joint family output and the family must enforce proper spouse behavior in much the same way firms enforce proper worker behavior in the face of worker temptation to shirk.

The possibility of differences between individual and family preferences is easiest to see in an arranged marriage. Since the marriage occurs without the consent of at least one spouse, that spouse's interests are more clearly different from the interests of the family than when marriage is voluntary.

Arranged marriage an easy example to use in understanding the model. More importantly, arranged marriage is common, being the norm in about half of the world's cultures. In an additional twenty percent of cultures, arranged marriage is an accepted alternative (Broude and Greene, 1983).

Most clearly in an arranged marriage, a family (F) chooses to accept a mate (M) if the increase in production or utility from doing so exceeds the compensation to the mate plus appropriate transaction and enforcement costs. Although applied here to arranged marriage, the model is

perfectly general. For example, each individual in a childless two-person marriage can be considered both "family" and "mate". The problem of differences between family and individual preferences is also present with children and when other relatives live in a household.

A mate can devote time to production of household goods, shared within the household, or can devote time to production of own goods, consumed only by the mate, leisure being an example of the latter. Household goods (P) are produced using inputs of time from both M and F , $P=P(m_p, f_p)$. More formally, inputs and outputs are each vectors representing the variety of uses of time and the variety of value-producing outputs. Positive but diminishing marginal products of both time inputs is assumed, as is a diminishing marginal rate of substitution between time inputs.

The function P is measured in some common unit of value. Unlike this model, Becker and others (Peters, 1986) use a production function where time and other inputs produce goods which are then combined into one composite household good. The use here of value functions allows time to be allocated to both individual and household goods and is equivalent to the indirect utility functions used by McElroy and Horney (1981) and by Manser and Brown (1980).

Goods are distributed in the household by changing the share of the household good given to family and mate. For now, assume the family sets the share. An equivalent assumption is to say that the share is set by market forces

in a way that maximizes joint family output. The share of the household good P allocated to the mate is given by s , the remainder of which $(1-s)$ goes to the family.

For reasons clear later, let share s be a function of parameter z which the family actually chooses, $s=s(z)$. s has a maximum equal to one (when $s'=0$, $s''<0$) and a minimum equal to zero (when $s'=0$, $s''>0$). For convenience, the maximum occurs when $z=1$ and the minimum when $z=0$.

Production of own goods is a function of individual time inputs. Y is the value of goods produced by F for F , $Y=Y(f_y)$, and X is the value of goods produced by M for M , $X=X(m_x)$. Positive but diminishing marginal product is assumed for both functions.

Following the new theory marriage, the interests of the family are separate from those of any particular member. Since F controls distribution of household good P and controls time allocations by M , F maximizes family value with respect to z , m_x , m_p , f_y , and f_p . The family is constrained by total time available to M and F and is constrained because F must assure that M receives income I at least equal to that available in another marriage, $sP+X \geq I$. If the next best alternative for M is to remain single, $I=X(M)$. The cost of divorce and remarriage is not explicitly included. Either I is net of these costs or the calculation is made before marriage.

The constrained maximization equation for the family is the following:

$$(a) \quad V_f = (1-s)P + Y - \lambda_1(m_p + m_x - M) \\ - \lambda_2(f_p + f_y - F) + \lambda_3(X + sP - I)$$

If the compensation constraint I is binding, M receives compensation equal to the best alternative and the maximization problem is solved using $\lambda_3 > 0$. The first order conditions with respect to z , m_x , and m_p follow:

$$(b) \quad \frac{\partial V_f}{\partial z} = - \frac{\partial s(P)}{\partial z} + \lambda_3 \frac{\partial s(P)}{\partial z} = 0$$

$$(c) \quad \frac{\partial V_f}{\partial m_x} = - \lambda_1 + \lambda_3 \frac{\partial X}{\partial m_x} = 0$$

$$(d) \quad \frac{\partial V_f}{\partial m_p} = (1-s) \frac{\partial P}{\partial m_p} - \lambda_1 + \lambda_3 (s) \frac{\partial P}{\partial m_p} = 0$$

The multipliers λ_1 and λ_2 are the marginal values to F of additional time for M and F. λ_3 is the marginal cost to F at equilibrium of an increase in the alternative income I to M. Given that $\lambda_3 > 0$ and since $\partial s / \partial z$ and P are positive, condition (b) shows λ_3 must equal one. The marginal cost to F of an increase in I by one dollar is one dollar, the amount F's income falls.

A sufficiently large $\partial V_f / \partial f_p$ or small $\partial V_f / \partial f_y$ induces F to devote all available time to production of household goods; "I simply have no time to myself." Similar conditions make F require M to devote all time to household production. Using a different model, Becker (1981) outlines in detail the conditions which encourage this total household specialization.

Since $\lambda_3=1$, conditions (c) and (d) simplify:

$$(e) \quad - \frac{\frac{\partial X}{\partial m_x}}{\frac{\partial P}{\partial m_p}} = -1$$

The left side of this equation is the slope of an isovalue curve from the function $V_f(m_x, m_p, \dots) = V_f^0$, holding other independent variables constant. At equilibrium, the slope of this functions equals the slope of M's time constraint (-1).

III. Conflicting Incentives

In the economic theory of the firm, individuals earn higher income by allowing themselves to be organized by an entrepreneur in a way that reduces otherwise considerable transaction costs. Such an arrangement also exploits economies of scale and promotes gains from specialization.

One important restraint on the gain from forming a firm is the cost of monitoring and enforcing appropriate behavior by workers. Workers have higher income because they are organized in firms, but once organized in firms, each worker has an incentive to shirk assigned responsibilities and so increase individual utility.

Because a family member only receives a share of the output produced with that member's time, the member has different preferences than those of the family. If M can choose own time allocations freely, M maximizes the

following function with respect to m_x and m_p . Since F distributes household goods, M takes the share of household goods s as given.

$$(f) \quad V_m = sP + X - \lambda(m_p + m_x - M)$$

The marginal value to M of additional time for M is λ . Notice that λ is in general not equal to λ_1 from maximization for F. The value of M's time is different for M than for F.

Rarrange the first order conditions:

$$(g) \quad - \frac{\frac{\partial X}{\partial m_x}}{(s) \frac{\partial P}{\partial m_p}} = -1$$

As before, the left side of this equation is the slope of an isovalue curve, this time from the function $V_m(m_x, m_p) = V_m^0$. Once again, the slope of this function equals the slope of M's time constraint (-1).

This equation would be identical to maximization for F were it not for the presence of the share term s in the denominator. The equilibrium marginal rate of substitution between time inputs is different for M because M receives only a share of the household good P.

M chooses less time for household production than is preferred by the family. In order to achieve a slope equal to (minus) one in condition (g), the numerator must be smaller than for condition (e), implying smaller marginal product of own production time and so more time is given to own production. Likewise, the marginal product of time for

the household must be larger for condition (g) than for (e), so less time is given to household production. Figure 1 compares isovalue graphs for M and F.

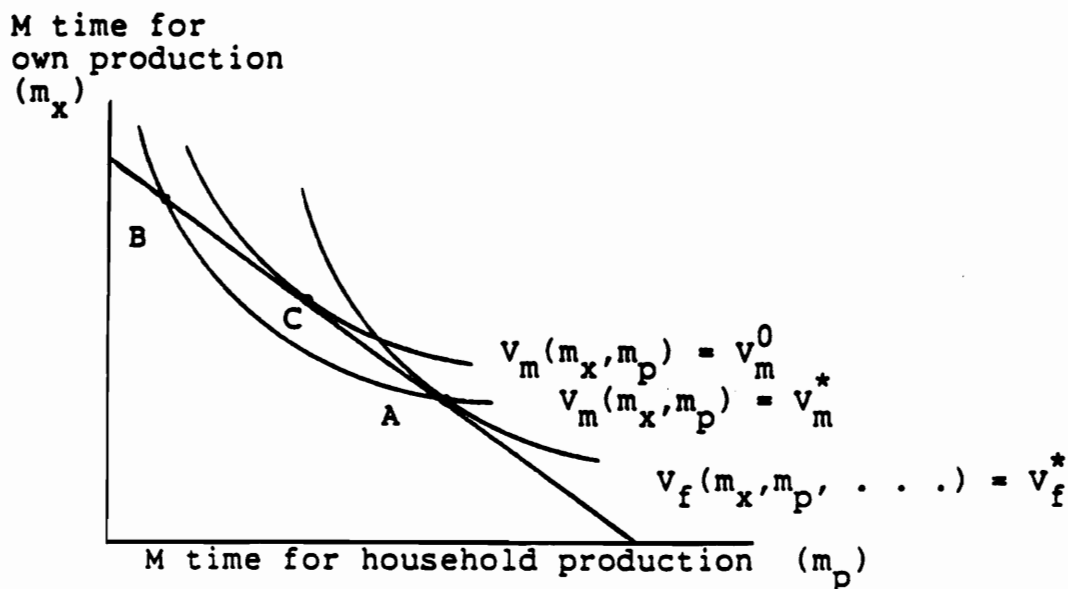


Figure 1. Comparing M and F Choices

Note that an isovalue curve for M passing through F's equilibrium point A has a slope equal to $-s$. This is shown simply by multiplying both sides of equation (g) by s and using the amounts of m_x and m_p which maximize value for F.

As the share given to M approaches one, the difference between optimal choices for M and F are reduced ($-s$ gets closer to -1). Thus, as the mate's share of household goods gets larger, the mate is less tempted to misbehave. If household goods are shared equally, members of larger households have greater temptation to misbehave.

Remember that the term "misbehavior" is used here without value judgement, only implying behavior different

than what the family prefers. Obviously, a mate does not view the difference in preferences as misbehavior.

The difference in time inputs chosen by F for M and those chosen by M for M is also influenced by the convexity of the isovalue function, the rate at which the marginal rate of substitution between time inputs changes. The equilibrium for M (point C) is always between points A and B in Figure 1. As the isovalue functions become more convex, the range of equilibrium points for M, and thus the difference between equilibrium points for M and F decreases.

The important component determining convexity of the isovalue function is the degree to which time inputs substitute between own and household production. If time inputs are easily substituted, the isovalue function is relatively flat, and M has relatively greater tendency to misbehave. A spouses ability to substitute time inputs depends in turn on the family's ability to monitor appropriate spouse behavior. For example, if each family member possesses specialized skills, other members find monitoring appropriate behavior difficult. The same holds if much labor takes place outside the household. A clear implication here is that family member misbehavior is more likely *ceteris paribus* in technically complex cultures with significant labor outside the household.

The time inputs of M preferred by M are different than those preferred by F for any distribution of household goods other than giving all of them to M, ($s=1$). This suggests

that M is tempted to misbehave regardless of the agreed distribution of household goods. A change in distribution (or, for that matter, a fixed payment) cannot be used to "bribe" M into behaving properly, although it can be used to reduce the temptation to misbehave. Becker's model incorrectly assumes transfers among family members can be made in a way that assures optimal behavior. The model here shows how contractual enforcement rather than side payments are necessary in a family.

How does the family make certain that a mate entering the family behaves properly? As mentioned, one method is for the family to control the choice of a mate. Interestingly, in some cultures, the bridewealth paid at marriage is refundable if the wife misbehaves. Since bridewealth is usually paid to a number of the wife's blood relatives, those relatives try to make the wife behave properly to protect the payments (Kottak, 1978).

Marriage arrangement is only one method employed to assure proper behavior, however. Families in some cultures completely isolate the wife at home. Wives of the Pakhtun of Pakistan are virtual prisoners (Lindholm and Lindholm, 1982) and the practice is common in other Islamic cultures. Cheung (1972) explains how the Chinese practice of binding women's feet is used to reducing the wife's ability to produce outside the household. That a wife is often isolated in order to prevent sexual misbehavior is consistent with this notion.

Religion is another tool to enforce strict marriage contract compliance. The bible encourages good behavior by the wife: "As the church is subject to Christ, so let wives also be subject to their husbands" (Ephesians, 5:24). The Koran is more concise: "Virtuous women are obedient, . . . " (Surah iv. i:-). By implication, cultures with religions which actively promote appropriate human behavior need rely less on other enforcement methods *ceteris paribus*.

IV. Love

To this point, the model of behavior in a marriage treats participants as selfish individuals interested only in increased consumption of own and their share of household goods. The model shows how this type of self-interest causes behavior desired by a family to diverge from that preferred by a mate. However, at least in modern western countries, couples ideally marry for love rather than simple material self-interest.

The presence of passion or romantic love is widely recognized in cultures and throughout history. However, love as a primary reason to marry appears only recently in history and is relatively uncommon among cultures even in the modern era.

The practice of marriage for love emerges in a limited fashion among the upper class in the latter stages of the Roman Empire and among some early Christians (Lantz, 1982; Goody, 1983:151). The courtly love of the Feudal period is

a dramatic form of love but is celibate. Upper class Europeans recognize marriage for love beginning in the seventeenth century. Although the practice spreads gradually to all classes in Europe and to the United States, marriage for love dominates western society only by the latter nineteenth century (Lantz, 1982).

Economists acknowledge the presence of love in marriage. However, like Peters (1986), most authors assume love is one output produced by a married couple. Becker (1981) shows how love by the head of a family can convert individual maximization to joint household maximization. Becker also recognizes the importance of love and caring in reducing the cost of enforcing appropriate family member behavior but does not outline the specific effects on the temptation to misbehave.

Economists have a simple technique to introduce love and caring into individual decision-making. Let the utility of M depend in part on the utility of F: $U_m = U_m(\text{own goods, household goods, } U_f)$. Changing the utility function to the value (inverse demand) functions used in this model, let θ be a function which converts value received by F to value received by M. Because value to F increases value to M, $\partial\theta/\partial V_f > 0$. Given the constraint on M's time, M's maximization equation becomes the following:

$$(h) \quad V_m = sP + X + \theta(V_f) - \lambda(m_p + m_x - M)$$

Rearrange the implied first order conditions:

$$(i) \quad - \frac{\frac{\partial X}{\partial m_x}}{(s) \frac{\partial P}{\partial m_p} + \frac{\partial \theta (1-s)}{\partial V_f} \frac{\partial P}{\partial m_p}} = -1$$

As before, M equates the marginal rate of substitution between time inputs to the slope of the time budget line. If M doesn't care about F, $\partial \theta / \partial V_f = 0$ and the ratio simplifies to that in equation (g). Without love, M is inclined to misbehave by devoting less time to household production than is preferred by the family.

By contrast, if M does care for F, the desire by M to misbehave is reduced or even eliminated. Consider the case where $\partial \theta / \partial V_f = 1$, that is, where M is indifferent between a dollar in value received by M or by F. Becker (1973) terms this situation "full caring". The denominator of (i) simplifies to $\partial P / \partial m_p$ and the resulting equilibrium is identical to that preferred by F in equation (e). If a mate considers own value to be the same as family value, the mate has no desire to misbehave.

"Full" caring is only one case, of course. If M cares less than fully about the family, $\partial \theta / \partial V_f < 1$. Here M's equilibrium response is between no caring and full caring since the slope of the equilibrium condition lies between those given by the extreme conditions (e) and (g). The desire to misbehave is tempered by love for the family.

If M considers own value of less importance than family value, $\partial \theta / \partial V_f > 1$. In this case, M is inclined to misbehave by devoting more time to production of household goods

(including companionship) than is preferred by F. A curious possibility. Can a lover try too hard to please? Certainly, and the popular media occasionally feature the result in tragic terms.

V. Love and Marriage Contract Innovation

The preceding section highlights the role of love in reducing the tendency of family members to misbehave by giving too little time to household production. Thus, love is an innovation in marriage contract enforcement, a substitute to other methods of assuring proper behavior.

That love and coercion are substitutes is an important implication of the theory but is insufficient itself to constitute a unique contribution. It is the other implications and their application to available cultural data that distinguish this research. In particular, the model allows an examination of the factors influencing the methods employed to enforce implicit marriage contracts.

Marriage for love seems to be an ideal alternative to coercion. Most obviously, marriage for love eliminates any monitoring and enforcement costs. Given its obvious advantages, why wasn't marriage for love invented earlier? Why doesn't marriage for love now dominate all cultures?

As with contract enforcement in general, the method employed to enforce a marriage contract depends on the ability to monitor behavior, the temptation to misbehave, and the ability to apply coercion or alter incentives. One

method used to assure proper behavior in ordinary contracts is uncommon in families: direct payment in money or goods. In fact, it is precisely because families possess an advantage in various non-market enforcement methods that they rarely use market alternatives (Pollak, 1985).

Full love eliminates the temptation to misbehave and so makes monitoring and coercion unnecessary. Love is a useful tool when monitoring behavior and applying other incentives is difficult. For example, when labor skills are specialized, family members without those particular specialized skills find monitoring more difficult. Also, as production moves out of the household, love gains a comparative advantage for marriage contract enforcement.

Marriage for love has costs, however. Search costs are higher since emotional compatibility is more difficult to find than simple productive skills. Marriage for love also faces higher decision costs after marriage. In an arranged marriage, distribution of household goods is typically made by family elders. Marriage for love more often encourages a cooperative decision about distribution, although cultural rules and religion provide accepted standards.

VI. Empirical Results

The hypothesis proposed in this paper is that societies promote the method of marriage contract enforcement best adapted to available production technology, incentives to misbehave, and methods of coercion. In other words, the

degree of coercion employed to enforce the marriage contract is a function of the ease with which love can be used and factors like job specialization, work outside the home, and family organization.

The Human Relations Area Files provides a unique opportunity to test the model. The Human Relations Area Files (HRAF) is a comprehensive source of information on human culture. The HRAF provides a detailed index and system of cross-referencing seven hundred categories of information from ethnographies written by anthropologists about more than three hundred cultures.

Some of this textual material has been coded by sociologists and anthropologists, the first important example being the Ethnographic Atlas (Murdock, 1967). Subsequent researchers have coded material for a subset of one hundred eighty-six cultures in the HRAF. The subset is labelled the Standard Cross-Cultural Sample and its cultures are chosen according to a variety of criteria including that all cultural types be represented, that territories not overlap, and that relatively comprehensive information be available (Murdock and White, 1969; Lagace, 1977).

The model implies that the degree of family coercion is a decreasing function of the use of marriage for love, a decreasing function of specialized labor skills, a decreasing function of work outside the household, a decreasing function of religious power, and an increasing function of family size. Estimates of these variables are

available for some of the cultures in the Standard Cross-Cultural Sample. Refer to the appendix for detailed definitions.

The dependent variable W-ARRANGE indicates the degree to which a woman's marriage is arranged by the family. GODS indicates the degree to which gods actively intervene in society. LOVE indicates the importance of romantic love. LOVE does not indicate the importance of conjugal love after marriage nor the importance of parental love of children. If they emerge at all, these forms of love tend to become important sometime after the wedding. MONEY indicates the complexity of currency. CRAFTS indicates the degree of specialized technical skills. FAMILY indicates the complexity of the family structure.

TABLE 1
MULTINOMIAL PROBIT WITH WOMEN'S ARRANGED MARRIAGE

	LOVE	CRAFTS	MONEY	GODS	FAMILY	INHERIT	n
(1)	-0.26 (4.53)	-0.26 (2.64)	0.24 (2.70)	-0.08 (1.22)	0.02 (0.47)	.	85
(2)	-0.26 (4.59)	-0.25 (2.60)	0.25 (2.79)	-0.08 (1.35)	.	.	86
(3)	-0.40 (3.58)	-0.26 (1.71)	0.43 (2.71)	-0.12 (1.18)	0.05 (0.61)	-0.49 (1.64)	35
(4)	-0.22 (1.15)	65

Dependent variable is W-ARRANGE. n is the number of observations for which complete data are available. Figures in parenthesis are the absolute value of the ratio of the coefficient and its asymptotic standard deviation, distributed normally for large samples.

Table 1 summarizes a series of multinomial probit equations using coded SCCS data. Multinomial probit is employed rather than multiple regression because the dependent variable is categorical and not continuous. As such, interpretation of the coefficients is awkward. They represent changes in the probability of a value for the dependent variable for increases in the independent variables, where independent variables are measured in standard deviations. Of real interest are the signs on the coefficients and their asymptotic significance.

Equations (1) and (2) show that the model's predictions are generally confirmed. Arranged marriage and love are strong substitutes. Further, an increase in craft specialization reduces the importance of arranged marriage.

Interestingly, arranged marriage and the complexity of money are directly related. The development of money is an important component of an industrial economy, just the sort of economy that favors wage labor outside the household. If work takes place outside the household, appropriate behavior is difficult for the family to monitor. On the other hand, money is easily measured and redistributed within the family, so the use of currency makes it easier for families to monitor member behavior. Further, the wage labor permitted by a well-developed currency means that market contracts are being used to monitor worker behavior. The market is replacing family enforcement.

The results also show that religion is a (weak) substitute for family enforcement. Finally, the complexity of the family structure does not significantly affect family choice of arranged marriage. In the case of family complexity, perhaps the difficulty of promoting love in a large family is offset by the potential for love to reduce monitoring costs with a large versus small family.

Equations (3) and (4) examine the hypothesis proposed by Goody (1976) that arranged marriage for women is in part a function of the degree to which women can inherit. Goody suggests that when women inherit, the family wishes to assert more control over mate choice. Although plausible, the data here do not confirm Goody's hypothesis.

The variable INHERIT measures the degree to which women versus men inherit valuable goods or property. The sign of the coefficient in equation (3) is the opposite of Goody's prediction but only marginally significant. Equation (4) isolates the INHERIT variable to increase the number of observations. The coefficient still has a negative sign and is statistically insignificant.

A more general view of Goody's hypothesis is also explored here. Here arranged marriage for either sex is a function of the degree to which they control valuable assets, including inheritance. The implied equations would also be of interest to researchers who emphasize the distribution of men's and women's power in a family, Berk (1985) being an example. Here the sex that has control over

family activities is less likely to experience arranged marriage and the other sex is more likely to experience arranged marriage.

Table 2 presents multinomial probit coefficients with the importance of arranged marriage for women and for men as independent variables. The dependent variables measure the degree to which women versus men inherit, control the household, control men's output, control jointly produced output, and control women's output. With the exception of the variable C-MENWOM, these factors also appear not to affect mate choice. In addition, the Goody and "power" hypotheses predict opposite signs for this variable in the two equations.

TABLE 2
ALTERNATIVE HYPOTHESIS ABOUT ARRANGED MARRIAGE

	Independent Variable	INHERIT	C-HOUSE	C-MEN	C-MENWOM	C-WOMEN	n
(5)	W-ARRANGE	-0.09 (0.29)	-0.15 (0.61)	-0.10 (0.30)	-0.74 (2.18)	-0.11 (0.36)	49
(6)	M-ARRANGE	-0.11 (0.38)	-0.39 (1.52)	0.26 (0.75)	-1.17 (3.33)	0.27 (0.83)	51

n is the number of observations for which complete data are available. Figures in parenthesis are the absolute value of the ratio of the coefficient and its asymptotic standard deviation, distributed normally in large samples.

The theories of Goody and the "power" researchers imply that marriage arrangement for women should substitute for marriage arrangement for men, representing two obvious

groups who can control valuable assets. The model presented in this paper shows how the decision to employ arranged marriage is determined largely by factors outside the family, factors like production technology and economic complexity. As such, the degree of marriage arrangement should be similar for both sexes in a given culture. The Pearson rank correlation coefficient between W-ARRANGE and M-ARRANGE is 0.65 with a standard error of 0.068, confirming the model's implication.

VII. Caveats

Although the statistical results lend an encouraging degree of support to the model, several caveats are in order. First, as is often the case, the regression variables do not always exactly correspond to measures in the theory. FAMILY, for example, measures the complexity of the family rather than the number of family members.

A second problem involves the coding process itself. Coders read text about a culture and assign a number according to some prearranged scheme. Such a process is obviously subjective. Some researchers address this problem by employing multiple coders, Ellis, Lee, and Petersen (1978) being an example.

A final potential problem, aside from the relatively small fraction of culture in the sample for which complete data are available, is that the Standard Cross-Cultural Sample is not a random sample. As mentioned, cultures are

chosen based on other criteria. This is a serious problem if the sample is biased in some way. For example, because of the emphasis of anthropological research, modern western industrial cultures may be underrepresented.

These problems ought not prevent economics researchers from exploiting the Human Relations Area Files. We claim our theories apply universally but typically restrict our empirical investigation to modern industrial societies. Research like this represents an attempt to redress the imbalance.

VIII. Summary

The model presented here adapts the theory of marriage by allowing a spouse to allocate time between production of own goods, consumed by the spouse, and production of household goods, shared by family members. Because household goods are shared, a spouse is tempted to misbehave by using more time for own production than is preferred by the family. The temptation to misbehave cannot be eliminated by altering shares of household goods or by other transfers.

The temptation to misbehave is reduced if a spouse "cares for" or "loves" the family. Thus, love can be a useful method of assuring contractual compliance in a marriage. Full caring eliminates misbehavior.

Regression analysis of variables coded from the Standard Cross-Cultural Sample of the Human Relations Area Files supports the theory. Arranged marriage and marriage for

love are substitutes. Arranged marriage is less likely in cultures where technical specialization makes family member monitoring more difficult. Because it makes monitoring easier and permits market contracting, cultures with a complete money system are more likely to promote arranged marriage. Religion also reduces the requirement for family enforcement. Family complexity has insignificant effect on the degree of marriage choice.

This paper represents a first and important attempt to exploit with economic theory the Human Relations Area Files. As such, this paper points to any number of areas for future research. As one example, empirical tests of the theory of marriage would benefit from additional variables coding information on love after marriage, the degree of coercion enforcing behavior within households, and the nature of work within and outside the household.

Appendix: VARIABLES USED IN STATISTICAL ANALYSIS

Name	Source	Range	Definition
C-HOUSE	(5)	1-4	Which sex controls dwellings? One indicates men only. Four indicates women only.
C-MEN	(5)	1-4	Which sex controls products of men's labor? One indicates men only. Four indicates women only.
C-MENWOM	(5)	1-4	Which sex controls products produced jointly by men and women? One indicates men only, four women only.
C-WOMEN	(5)	1-4	Which sex controls products of women's labor? One indicates men only. Four indicates women only.
W-ARRANGE	(1)	1-6	Degree to which a woman's marriage is arranged. Six indicates parents choose partner and woman cannot easily object.
GODS	(2)	2-10	Degree to which gods actively intervene in society. Ten indicates active and supportive of human morality.
INHERIT	(5)	1-4	Which sex inherits valuable property? One indicates men, four women.
LOVE	(2)	2-10	Importance of romantic love. Ten indicates very important.
M-ARRANGE	(1)	1-6	Degree to which a man's marriage is arranged. Six indicates parents choose partner and man cannot easily object.
MONEY	(3)	1-5	Complexity of currency in the economy. Five indicates a fully developed and specialized currency.
CRAFTS	(4)	1-5	Degree of craft specialization. Four indicates a variety of specialists, including smiths, weavers, and potters.

(1) Broude and Greene, 1983. (2) Ellis, Lee, and Petersen, 1978. (3) Murdock and Morrow, 1970. (4) Murdock and Provost, 1973. (5) Whyte, 1978.

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