

**Women's Labor Force Participation and Status Exchange in Intermarriage:
A Model and Evidence for Hawaii¹**

Shoshana Grossbard-Shechtman
Department of Economics
San Diego State University
San Diego, CA 92182-4485
Tel 619 5945468 fax 619 5945062
shosh@mail.sdsu.edu

and

Xuanning Fu
Office of Academic Programs
University of California, Merced
Fresno, CA 93710
xuanning.fu@ucop.edu

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Women's labor force participation, ethnic status and interracial marriage are examined in this paper to test Grossbard-Shechtman's marriage market theory. Perceived racial and ethnic group status is found to be an important attribute in market exchange that combines marriage and working outside the home. Caucasian women, who have a higher perceived ethnic status, tend not to work when they marry men of a lower perceived ethnic status, while the opposite is found of women who have a lower perceived group status and who marry into a higher-status group. This is especially of women with low education, while highly educated women are less affected by compensating differentials at marriage as related to ethnic status of the couple. Ethnic groups that have a recent immigration history also have a different pattern of intermarriage and women's labor force participation.

In this paper we link marriage market conditions characterizing various ethnic groups to women's labor market participation using Grossbard-Shechtman's marriage market theory. Theoretically derived predictions are tested using marriage certificate data from the state of Hawaii. We focus on four racial/ethnic groups (Caucasian, Hawaiian, Japanese, and Filipino) and pay special attention to how cross-group marriages are related to women's labor force participation. We anticipate that perceived racial and ethnic group status will be an important attribute in the exchange-based process of mate selection. For instance, if Caucasian women obtain higher values in marriage markets than women from other groups, we expect this to reduce their relative need to participate in the labor force, especially if they have low education and work principally out of economic necessity. Hawaii is a good place to test our predictions, as the island is characterized by high rates of intermarriage: during the last decade the outmarriage rate stood at around 46% (Fu and Heaton 1997).

Theoretical perspectives: the literature

Marriage and labor supply are inter-related to the extent that marriage involves household production and that spouses supply labor to both household production and paid labor force. Economic theories concerning women's labor supply and marriage have drawn from Mincer (1962), Becker (1965) and Grossbard-Shechtman (1984; 1993). These economic explanations of mate selection and labor market participation both draw on rational choice models and marriage market analysis. To the extent that they are based on rational choice, economic theories are similar to other theoretical perspectives on mate selection based on rational choice models (e.g. Blau, Blum & Schwartz 1982; Blau & Schwartz 1984).

Most theories that explain why people marry out of their racial groups and whom they

outmarry incorporate the concept of rational choice. Choice of spouse often reflects racial/ethnic proximity, cultural preference and exchange of socioeconomic status. Choice of spouse also varies with availability, in turn a function of relative group size, number of groups, degree of ethnic residential concentration², and sex ratios for the marriageable population in each group (Blau, Blum and Schwartz 1982; Gurak and Fitzpatrick 1982; Blau and Schwartz 1984; Schoen 1986; Spickard 1989).³

Our focus here is on what sociologists have called status exchange in marriage and what has been called compensating differentials in marriage in Grossbard-Shechtman (1993). We will briefly present our arguments on individual choices and status exchange in marriage, assuming rational decision-making in mate selection and the existence of marriage markets. If the availability of marriageable men and women is assumed as given, the likelihood that individuals will marry out of their group largely becomes a function of their individual resources. Sociologists have analyzed this process in terms of exchange theory and found that the greater the demand for a social attribute, the higher its price will be in a given social exchange setting (Edwards 1969; Blau, Becker and Fitzpatrick 1984; Schoen and Wooldredge 1989). In the context of marriage formation, individuals with highly desirable attributes will obtain the best returns to their market value if they secure a marriage partner who also has desirable attributes (Wallace and Wolf 1991). Those who lack a highly desirable social attribute may be willing to pay a price in exchange for this attribute in a mate. This explains the tendency for homogamy: couples tend to be alike in most aspects of their demographic and social characteristics, including race, ethnicity, age, religious beliefs, political views, socioeconomic status, physical attractiveness, etc. It also explains why in the case of a couple with dissimilar characteristics, an exchange of attributes tends to "make up the imbalance."

When applied to intermarriage, exchange theory can be viewed as a barter theory or a

bargaining theory. Bargaining theories have gained wide acceptance in the economics literature on marriage in the last twenty years, starting with Manser and Brown (1980) and McElroy and Horney (1981).⁴ Exchange theories and bargaining theories of marriage examine exchange and allocation of goods in a marriage: people trade a set of attributes for a spouse's set of attributes. Potential mates with few desirable attributes in the marriage market can possibly marry their match. Otherwise, they need to pay a price, usually measured in terms of marriage to a spouse from a less prestigious group or to a spouse who lacks other desirable attributes such as education or high income.

In the context of individual choice between ethnic exogamy (outmarriage) and endogamy (ingroup marriage), exchange theory implies that members of lower status minorities who marry into the dominant group will exchange their inferior ethnic status for their partner's inferior status in another area (Spickard 1989). For instance, there could be an exchange in marriage between minority men of high achievements and Caucasian women of low achievements, as such a marriage signals greater prestige for the husband and brings higher material rewards to the wife (Davis 1941; Merton 1941; Blau 1964; Edwards 1969; Campbell 1971; Heer 1974; Schoen and Wooldredge 1989; Kalmijn 1993). Furthermore, this theory implies that the lower a particular ethnic group on a status hierarchy of ethnic groups, the higher the price the members of that group are likely to pay to marry out. The same insights follow from bargaining theory.

Like exchange theory and bargaining theory, competitive marriage market analysis assumes rational choice and exchange (Becker 1981; Grossbard-Shechtman 1993). Competitive marriage market analysis also recognizes that a price mechanism may help organize marriage markets. More specifically, marriage markets have two sides: aggregate demand and aggregate supply. In such models, men with the same characteristics compete with each other on the same side of the market, and so do women on the other side of the market. Markets then establish equilibrium prices that are

a function of aggregate demand and supply.

To the extent that the price is paid in terms of a personal attribute valued in the marriage market, competitive marriage market analysis leads to the same conclusion as does exchange theory: a member of a less prestigious group pays a price for marrying a member of a more prestigious group, the price being paid in terms of higher income or other desirable characteristics. To the extent that the price for a desirable spouse is paid in terms of one's own similar desirable characteristic, most marriages will be homogamous. For instance, women from an ethnic group in relatively high demand, and who therefore command a high "price", may marry men who pay that price through barter of the same valuable characteristic, e.g. men who are from the same ethnic group.

In addition to the same conclusions as exchange theory or bargaining theory, competitive marriage market theory also leads to implications that are not typically derived from exchange theory. According to a competitive marriage market model, prices may be paid not only in the form of barter but also in the form of a monetary transfer similar to wage payments in labor markets. The analogy with competitive labor market analysis goes as follows: in the labor market, workers of different skills supply their labor to potential employers offering different work environments, and the wage mechanism will allocate the workers across employers. Employers who offer more pleasant working conditions will pay lower monetary wages. Employers with an unpleasant workplace will have to pay compensating differentials in wage to attract the same workers, as they are competing with employers offering pleasant work conditions. Similarly, in the marriage market individuals with highly desirable characteristics may get paid by obtaining extra access to their spouse's income or by giving a lower transfer of their own income to their spouse (Grossbard-Shechtman and Neuman 1988; Grossbard-Shechtman and Neideffer 1997). The price paid to offset undesirable characteristics is called *a compensating differential in marriage*.⁵

To a large extent we can still assume traditional gender roles in today's households. It continues to be the case, even in the contemporary United States, that wives are more involved in household production than are husbands (Hersch 1997). Given traditional gender roles, compensating differentials imply that men who come from groups perceived as less desirable will make above-average transfers of their earned income to a wife coming from a more desirable group. Also, for women who come from groups perceived as less desirable and who prefer a traditional marriage, compensating differentials may take the form of below-average receipts of income transfers from their husband.

When estimating compensating differentials in labor markets, economists use wage data. In the case of compensating differentials in marriage markets, we cannot measure compensating differentials in marriage directly since information on monetary transfers within marriages is very difficult to obtain. It was certainly not available in our marriage registry data. However, we can measure labor supply, and that supply is a function of the opportunity costs of working. Assuming people prefer not to work, the more a person obtains an income from being married, the less that person is likely to work for pay.

Previous studies of women's labor market activities and status exchange through marriage have mostly focused on women already in marriage. In this article we examine women's labor market activities and marriage-related status exchange at the time of marriage. This strategy can help reveal conditions of status exchange because such exchanges are more directly manifested at the time of marital formation (Grossbard-Shechtman & Neideffer 1997; Fu & Heaton 1997).

Theoretical model

Let us call time and efforts spent in household production benefiting a spouse "Work-In-

Marriage.”⁶ It is assumed that there are markets for Work-In-Marriage supplied by people belonging to different gender and ethnic groups, and that these markets are competitive and lead to the establishment of market-clearing quasi-wages for Work-In-Marriage supplied by women and men with varying characteristics. For markets for Work-In-Marriage to operate it is necessary to assume that Work-In-Marriage is not spouse-specific but can benefit any potential spouse participating in the same marriage market.

Consider the following choices by a spouse/producer who works in marriage: labor force participation, household production benefiting oneself, or work in married household production (Work-In-Marriage). For simplicity, let us assume that people are influenced by traditional gender roles and that the spouse/producer is a woman. Other than income from a husband, it is assumed that there is no other form of income available to women. The woman considers time/goods trade-offs in terms of her own productivity and consumption preferences. It is assumed that her husband enjoys the exact same goods that she produces (i.e. there is joint consumption and the goods that she produces are household public goods) and that he is willing to pay the marriage market clearing quasi-wage for Work-In-Marriage in order to motivate her to produce these goods. The woman may also have non-work income Y , from sources such as income transfers from her husband that are not conditional on Work-In-Marriage, such as savings or lottery prizes. It is also assumed that paid work in the labor force has no intrinsic value.

It is assumed that an actual or potential Work-In-Marriage worker, let us say a woman, is maximizing a utility function $U(x)$, where x stands for goods. The total amount of goods that she can consume as a result of an hour of household production is the sum of the goods that she

produces in the household defined as x_m , plus the commercial goods x_c that she purchases, i.e. $x = x_c + x_m$. Assume the following production function for x_m , $x_m = f(m)$, with $f' > 0$ and $f'' < 0$. She maximizes her utility subject to a time constraint $T = l + s + m$, where l is labor, s is household production benefiting oneself and m is Work-In-Marriage, Work-In-Marriage. She also has a budget constraint, $x_c = ym + wl + Y$, where w is wage and y is quasi-wage for Work-In-Marriage established in the marriage market to which this woman belongs and possibly including compensating differentials in marriage. It is assumed that the price of commercial goods is 1.

Maximization leads to first order conditions:

$$w = MU_s / MU_x = y + f' \quad (1)$$

The equality on the left is the first order condition in Robbins' (1930) time/goods tradeoff and corresponds to the point where the budget constraint with slope w is tangent to the indifference curve denoting preferences for time and goods. The equality on the right of this first order condition states that the marginal rate of substitution between time and goods also has to equal the sum of y , the quasi-wage for Work-In-Marriage, and the marginal productivity of Work-In-Marriage (m) from the perspective of the Work-In-Marriage worker. That sum is the total personal benefit that the woman derives from engaging in an hour of Work-In-Marriage: she enjoys that hour of household production directly at a level f' in terms of the home-produced goods she produces and consumes. In addition, she benefits from being paid at a rate y for engaging in that hour of Work-In-Marriage which allows her to buy commercial goods (In the extreme case of a person who engages in Work-In-Marriage without enjoying any of the goods that she produces, her only gain from Work-In-Marriage would consist of the wage y that she

earns and of the goods that she can buy with her ensuing earnings). She will either work in paid employment l or in Work-In-Marriage, depending on whether w exceeds $y + f'$ or not.⁷

In equilibrium, an individual capable of Work-In-Marriage is indifferent between work for pay in the labor force and Work-In-Marriage if

$$w = y + f'. \quad (2)$$

From the perspective of a rational choice model, marriage is a choice (Becker 1973; 1981). In this model, the decision to supply labor in marriage is also a choice that implies the choice of marriage versus no-marriage. The higher the quasi-wage y , the more it is likely that a Work-In-Marriage supplier will stay home. Given traditional gender roles, women are more likely to supply Work-In-Marriage than men.

We now introduce various ethnic or racial groups into the model, each group of Work-In-Marriage suppliers having its own marriage market. A woman's own group status will affect the quasi-wage for Work-In-Marriage that she can obtain: relative to women from high prestige groups, members of a group whose status is perceived as lower are likely to be less in demand and therefore will be offered lower quasi-wages for Work-In-Marriage. These low status women are therefore more likely to participate in the labor force.

Formally, consider a choice of husbands of type A or B, and assume that type A is considered more attractive than type B. Overall, one expects $y_A + f'_A = y_B + f'_B$, i.e. the total package that women of given characteristics get by marrying men of type A or B will be the same. If many women feel that type A is more attractive than type B, on average the following will hold: $f'_A > f'_B$. Competition in markets for women's Work-In-Marriage will create compensating differentials

$$y_B - y_A > 0,$$

so that $y_A + f'_A = y_B + f'_B$ continues to hold. This implies that the less attractive men of type B have

to pay a higher quasi-wage in order to obtain the Work-In-Marriage of women of given quality.

Since a lower quasi-wage y implies a higher likelihood of participating in the labor force, it follows that women who marry more attractive men of type A are more likely to participate in the labor force than women who marry less attractive men of type B. This prediction can be tested as we can measure a number of characteristics that make people attractive in marriage, such as age at marriage, education, number of prior marriages, job prestige, income, and perceived physical attractiveness.

Why various groups are valued differently is a matter of speculation. Marriage market discrimination against racial/ethnic minorities could be the result of a desire to assimilate into the White majority. It could also be that there is statistical discrimination against members of groups that usually are less successful in terms of income and education. Given that in the U.S. Whites are the majority group, both arguments lead us to predict higher Work-In-Marriage values for White women than for non-White women, and thus compensating differentials in marriage benefiting White (Caucasian) men and women. Given such discrimination, non-Caucasian men who marry Caucasian women will have to pay compensating differentials, which are likely to keep more Caucasian women out of the labor force than if they marry endogamously. More specifically, we derive the following prediction:

Prediction 1: Caucasian women working out of financial necessity and marrying out of their ethnic group are less likely to participate in the labor force than Caucasian women who work for the same reasons and married endogamously.

Our study of marriage data in Hawaii offers an opportunity to further examine compensating

differentials in marriage. In Hawaii, no ethnic group has the numerical majority: Caucasians, Hawaiians, Japanese and Filipinos are the four largest groups. They make up over 80% of the state population, which also includes some Blacks, Hispanics, other Asians and other Pacific islanders. If quasi-wage differentials in Work-In-Marriage markets are based solely on statistical discrimination regarding income and education, one expects compensating differentials to apply only to groups with average incomes lower than that of Caucasians, such as Black, Hawaiian, and Hispanics, but not to Japanese-Americans, a group with higher average education and income than that of Caucasians.

Nationally, from 1985 to 1995 (the period that covers our data) about 74% of White persons of 25 years of age or older completed at least 4 years of high school, while the comparable percentages for Blacks and Hispanics are only about 60% and 49% (U. S. Bureau of the Census 1997). These percentages gradually increased from 1985 to 1995, but the gaps among the groups remained relatively unchanged. During the same period, the median household income was significantly higher for Whites than for Hispanics and Blacks, with little change over time (U. S. Bureau of the Census 1998). Pacific Islanders, including Hawaiians, had a socioeconomic status comparable to that of Blacks (Hawaii State Data Book 1993-94). In contrast, Asian Americans have been doing better than their White counterparts. Asians are the only group that had both a higher proportion of educated population (high school or more) and a higher household income than Whites (U. S. Bureau of the Census 1997; 1998). Therefore, from the point of view of income/education based statistical discrimination, one does not expect discrimination against Japanese Americans in Hawaii's marriage markets. However, if discrimination is a function of racial preferences unrelated to income and education, let us say it is a function of Caucasian looks being valued more than Japanese looks, one expects

compensating differentials in marriage benefiting White men relative to Japanese men, and Prediction 1 would hold for all exogamously married Caucasian women, even if Caucasian women marry into a non-Caucasian group with higher average income or education.

If there are three or more groups in the marriage market, compensating differentials in marriages of high status women—let us say Caucasians—will vary with the perceived status of the group to which the husband belongs. Consequently, we predict that

Prediction 2. The lower the perceived status of the husband's group, the higher the compensating differentials that a Caucasian wife is expected to receive in marriage, and the lower her predicted participation in the labor force if she works out of financial necessity. If discrimination is based on a group's expected earnings, we expect Black or Hawaiian men to be valued less than Caucasian men but Japanese-American men will be valued at least as much as Caucasian men. Given compensating differentials in marriage Caucasian women married to Blacks and Hawaiians will be less likely to participate in the labor force than endogamously married Caucasian women, but that is not expected to be the case with Caucasian women married to Japanese-Americans.

In both of the above predictions "Caucasian women" can be substituted with women from any ethnic group that has a high perceived social status in the marriage market. For the group that seems to be at the lower end of the status scale in Hawaii, the Hawaiians, one expects Predictions 1 and 2 to be reversed. Women who marry outside their group are expected to be paid lower quasi-wages for Work-In-Marriage and therefore to participate in the labor force more. As for ethnic groups who possibly have intermediate status, such as Japanese or Filipino, it will be important to separate the various types of exogamy depending on whether women marry

a Caucasian, a Hawaiian or an African American.

So far it was assumed that traditional gender roles prevail, and that work in the labor force is an activity that tradition-bound women would rather avoid, if they can afford to. Paid work only appeared in women's utility function as a source of income, and not for its intrinsic value. In reality, however, married women often choose to participate in the labor force out of career commitment. This implies utility functions that include satisfaction from paid work. The more a woman is educated, the more she is likely to enjoy work and to want to participate in the labor force.⁸ Therefore, the predictions above are applicable to women with few years of schooling more than to highly educated women. This leads to a third prediction:

Prediction 3. Among Caucasian women, the interaction of exogamy and education will be positively associated with labor force participation. In other words, for Caucasian women, the negative coefficient of outmarriage in a labor force participation regression will be smaller (in absolute value) for highly educated women than for less educated women.

Likewise, for Hawaiian women, the positive coefficient of outmarriage will be smaller for highly educated women than for less educated women. In sum, our previous two predictions are more likely to apply to women of lower educational achievements. An alternative interpretation of the effect of an interaction term between exogamy and education is that educated women discriminate less against minority husbands.

Other factors that influence the labor supply decision

Past economic studies of women's labor market supply have included the following variables: a woman's own market wage, husband's wage, number of children (Mincer 1962),

education, previous marriages, religion (Becker 1973; Heckman 1974; Chiswick 1988; Lehrer 1995; Grossbard-Shechtman & Neuman 1998), attitudes toward women working outside the home (Oppenheimer 1994), or sex ratio (Grossbard-Shechtman & Neideffer 1997, Grossbard-Shechtman & Granger 1998). In this study, we examine labor supply of women at time of marriage from marriage registry data. We do not have data on children, religion, attitudes towards working women, or sex ratios, but include wage estimators, education, and number of previous marriages. It is expected that women's labor force participation will be positively associated with own wage, education and previous marriages, and negatively associated with husband's income.

We will also be testing another prediction that follows from a compensating differentials analysis based on a market analysis of marriage. To the extent that being substantially older than one's spouse is a characteristic valued negatively in marriage markets (if for no other reason, it increases the likelihood that the person becomes a widow or widower), it follows that a husband much older than his wife will have to compensate his wife for her Work-In-Marriage more than a comparable man closer to his wife's age, and therefore women married to substantially older husbands are expected to participate less in the paid labor market. Grossbard-Shechtman and Neuman (1988) derived this prediction and found evidence to support it using a sample of married Israeli women with a high school education or less.

Data and methods

Our analysis is based on marriages registered in the state of Hawaii from 1983 to 1994. Data on marriage certificates were obtained from the Office of Health Status Monitoring, Department of Health, State of Hawaii (HSMDH 1995). From 1983 to 1994, there were 117,428 resident marriages registered in the state of Hawaii (a resident marriage has at least one spouse who is a Hawaii

resident). Grooms and brides in the data are classified into 18 ethnic groups based on their self-reported entry on the marriage certificates, but the majority of them (81.4% of grooms and 82.4% of brides) come from the four large groups of Caucasians, Japanese, Filipinos and Hawaiians (native Hawaiians and Part-Hawaiians combined). The rest are Black, Chinese, Korean, Vietnamese, Indian, Samoan, Native American, Mexican, Cuban, Portuguese, Puerto Rican, Guamanian, Other Asians, and Other Pacific Islanders. Because these small groups have very few cases of intermarriage between one another, we will focus our analysis on brides from the four large groups. However, we will use six groups of grooms: the four large groups and two reference groups: Blacks and “Other”, which combines all the other 13 groups. Despite their small group size Blacks are used in the analysis as a separate reference category because Black/Caucasian marriages have been extensively studied and it is important to compare our results with those in the literature. However, given the small number of intermarriages between Blacks and the other three groups (Japanese, Filipinos and Hawaiians), our results regarding brides from these groups who marry Blacks should be interpreted cautiously.

Our analysis will focus on how mate selection affects bride’s labor market participation at time of marriage, controlling for both groom and bride’s education, occupation and other selected demographic variables, including racial background, age at marriage, and number of prior marriages. One drawback of our data is the absence of an income variable. Instead, we use occupation to approximate job prestige. Occupation recorded in Hawaii’s marriage certificates has nine categories, as presented in Appendix 1. We assign Treiman’s occupation prestige scores to these job categories (Treiman 1977; Fu & Heaton 1997), and use the scores as an interval variable in our analysis.⁹ There exist substantial differences across Hawaii’s ethnic groups as far as occupational prestige and educational achievement is concerned (Labov & Jacob 1986; Parkman & Sawyer 1967; Fu &

Heaton 1997). The Japanese grooms and brides have the highest percentage in professional and managerial jobs, followed by Caucasians. Hawaiians and Filipinos are roughly equal in their distribution by job categories, while the majority of Blacks are in the military. Brides of all groups are much more likely not to be employed at the time of marriage than grooms, reflecting the popularity of traditional gender roles in Hawaii during this period.

Education is a continuous variable in the marriage certificate data that counts number of years of completed schooling, from zero to seventeen. Its first 17 values (0-16) are actual numbers of years, but the last value (17) summarizes all graduate degrees, which typically take longer than one year to complete. To better represent years of schooling, we assign a numeric value of 18.5 in place of 17, assuming that on average it takes two and a half years for one to complete graduate school (for master's and doctorate degrees combined). Similar to occupational prestige, educational achievement is also highly stratified across groups: the Japanese and the Caucasians have proportionally more brides and grooms with college and graduate degrees than the other groups. The difference in education between genders is minimal: grooms and brides of the same ethnic group basically have the same education.

To test the age difference prediction, we created a variable of age difference indicating an age gap above the average husband-wife age difference in one's group (The husband is on average 2.5 to 3.2 years older than the wife across the four groups).¹⁰ The value of this variable is set to zero if the husband is younger than his wife, or he is older by less than one year above the average age difference between husband and wife for her ethnic group. The value of this variable becomes a positive whole number when the husband is older than his wife by at least one year above her group average husband-wife age difference.

Since our dependent variable is a dummy for occupation categories (no occupation vs. all the

other categories), bride's actual job prestige cannot be used as an explanatory variable in the model. Instead we include bride's estimated job prestige that was estimated with a linear regression model. This is an already accepted method of job prestige estimation (See Gronau, 1981 and Grossbard-Shechtman & Neuman, 1988). The explanatory variables that we included in the estimated job prestige regression are the same that are included in estimated wage equations that are a standard procedure in labor supply estimations: education, age, age square, the interaction of age and education, and state residency status.¹¹ Those currently enrolled in college are excluded from our regressions of estimated prestige. We limit our entire analysis to women ages 18 to 40, as most brides are younger than 40. All models include interaction terms between groom's ethnicity and bride's education to test for prediction 3 (regarding the association between labor supply, outmarriage, and education).¹²

Because the dependent variable in our study is whether or not a woman is in the labor force at the time of marriage, logistic regression seems to be the appropriate method of analysis. The dependent variable is coded 1 if the bride is in the labor force at the time of marriage and 0 if she is not. Explanatory variables in the model include age at marriage, age difference between couples, education, number of marriages, groom's job prestige score, and bride's estimated job prestige score. Interaction between these predictors will also be considered in the model.

For each ethnic group of brides, we estimated two logit regressions of labor force participation. In the first regression model, we included a dummy for outmarriage and interaction terms between outmarriage and all the other right hand side variables. In the second regression models, we distinguished between various forms of outmarriage depending on the specific ethnicity of the groom. The first set of models are reported in Table 1, and the second set of models are reported in Table 2. The latter models also include interaction terms between groom's ethnicity and

bride's education, as we expect our predictions to hold better for women with low education.

Findings

Simple Tabulations

For each of the four groups of brides that were analyzed, Appendices 2 to 5 report the means and standard deviations of the explanatory variables included in our logistic analysis. They also cross-tabulate many of the bride's characteristics by groom's characteristic. Take Appendix 2 for example, the "Total" column is for all Caucasian brides and their grooms, while the "All outmarriage" column includes only outmarrying Caucasian brides. The average number of years of education is 13.56 for all Caucasian brides, 13.66 for those who married Caucasian husbands and 13.30 for those who married non-Caucasian husbands. The average education for the husbands of Caucasian brides is 13.59, 13.66 and 13.43, respectively for the above three marriage types. Appendix 3 to 5 are similarly arranged for the other three groups (Hawaiians, Japanese and Filipinos).

It is evident that mate selection is somewhat stratified by socioeconomic status across groups. Caucasian brides who marry Caucasian or Japanese husbands have educational achievement and job prestige higher than their group average, but those who marry Hawaiians or Filipinos have lower than average education and job prestige. Conversely, Caucasian and Japanese husbands tend to have higher socioeconomic status than those from other ethnic groups. Status matching is apparent in mate selection. It is also important to note that outmarrying Caucasian brides on average have lower education and job prestige than those who marry within their ethnic group.

Hawaiian brides who marry Caucasian and Japanese husbands, as seen in Appendix 3, have higher education and job prestige than those who marry ingroup or marry into other groups. These

results almost present a mirror image of the patterns for Caucasians. Status matching is closely observed regardless of the particular ethnic group that the brides and the grooms marry into. The outmarrying Japanese brides (Appendix 4) in general have lower socioeconomic status than inmarrying brides. However, Japanese brides who marry Caucasian husbands have higher education and job prestige than those outmarrying into other groups. The demographic characteristics of the Filipino brides as shown in Appendix 5 are rather similar to these for Hawaiians, especially their education and job prestige (slightly higher than Hawaiians but lower than Caucasians and Japanese). However, Filipino brides who marry Caucasian husbands have lower job status than those marrying ingroup, a pattern opposite to that of Hawaiians. Those who marry Japanese husbands have the highest job prestige and education among all Filipino brides.

Logistic models

Probabilities of a bride's labor force participation are presented in Tables 1 and 2, in two different logistic regression models. The dependent variable in the models is whether or not the bride is employed for pay at time of registering for marriage. Each column presents results for a different group of brides. Table 1 presents results of regressions of a bride's probability of labor force participation including the variable 'outmarriage', and full interaction models where every single variable is interacted with outmarriage .

[Tables 1 and 2 here]

Table 2 includes dummies for 5 possible ethnicities for the groom, and interaction terms between these ethnicity dummies and years of education of the bride. We discuss results for each group of brides separately.

Caucasians.

Column 1 in Table 1 reports a full interaction model that includes interactions between

outmarriage and all the other predictor variables, as it was estimated for Caucasian women. The results reveal that for Caucasian women at low levels of education there was a strong negative correlation between likelihood of labor force participation and marriage outside one's group. This is consistent with prediction 1. It is also possible that alternative explanations, including explanations based on reverse causality, explain this result. If this finding is explained along the lines proposed in the theoretical section, Caucasian women with low education tend to obtain extra monetary compensations when they marry men from other ethnic groups, thereby avoiding labor force participation more often.

The positive coefficient of an interaction of bride's education and groom's ethnicity implies that prediction 1 is supported only when Caucasian women have low education. This is consistent with prediction 3. The underlying assumption was that prediction 1 is limited to situations where traditional gender roles and racial prejudices are most prevalent, and that education frees people from prejudice and gender role rigidity. The total association between outmarriage and woman's labor supply is the sum of the linearized coefficient of outmarriage and that of outmarriage interacted with bride's education. We find that outmarriage and labor force participation of the bride are negatively associated among Caucasian women only if the women have 14 years of education or less.¹³

The findings reported in Column 1 of Table 2 imply that husbands from different ethnic groups are paying different outmarriage compensations. Only when a Caucasian woman of low education marries a husband who is Hawaiian, Filipino, or Black, is outmarriage associated with a lower propensity to work for pay at the time of marriage. In contrast, low education Caucasian women who marry a Japanese husband appear as likely to work as Caucasian women who marry a Caucasian husband (the coefficient of Japanese groom is insignificant), suggesting that Caucasian

and Japanese men have similar status in the eyes of Caucasian women living in Hawaii, and that a group's average income and education have an important influence on a group's relative status. These variations in bride's labor force participation can be interpreted as evidence of status-related compensating differentials in marriage market value, and are consistent with Prediction 2.

Interaction terms between groom's ethnicity and bride's education (Table 2 column 1) indicate that for Caucasian women marrying Hawaiians, Filipinos, and Blacks, the total coefficient of groom's ethnicity changes from negative to positive when women have more years of schooling. These changes in the sign of the education variable are in accord with Prediction 3. We also find that the higher the groom's education, the less outmarriage is likely to be associated with lower labor force participation of women.

Other coefficients reported in Tables 1 and 2 are also interesting. A bride is more likely to be in the labor force at the time of marriage if she has a high estimated job prestige and if she is marrying a husband with high job prestige. This holds for brides of all four ethnic groups, regardless of groom's ethnicity. For Caucasian women, the effect of the bride's education is positive, and so is that of the groom's. However, the compounded effect of brides' and groom's education is negatively associated with bride's labor participation.¹⁴ Bride's age at marriage has a negative effect, i.e., the older the bride, the less she is likely to work, but this effect is not linear and reverses itself at older ages.

The greater the age difference between husband and wife --that is, when the husband is older than his wife above the norm of two years-- the less it is likely that the bride works for pay. This is another finding that applies to brides of all ethnic groups. This possibly indicates differential compensation in the marriage market, where potential husbands who are a lot older than their brides pay a price for bringing these extra years to the marriage. Given this differential compensation, the

wife who so wishes is more likely to afford not to work. Grossbard-Shechtman and Neuman (1988) had found a similar result for Israel. In a similar vein, Browning, et al (1994) found that women married to older husbands purchase more consumption goods that benefit them, and Woolley (forthcoming) reports that women married to older husbands have more control over the couple's money.

Hawaiians. From column 2 in Table 1 it appears that for Hawaiian women the coefficient of 'outmarriage' is not significantly different from zero in a full interaction regression model. However, the coefficient of 'outmarriage and education' is significantly negative. The linearized coefficient of this interaction term equals $-.0027$. With each year of education, a Hawaiian woman who outmarries reduces her likelihood of being in the labor force. The effect of the interaction between education and the outmarriage dummy is the opposite of what we found in the Caucasian model.

From Table 2, column 2, we learn that the relationship between Hawaiian wives' labor force participation and outmarriage depends on the particular ethnicity of the husband. Hawaiian brides who marry a Japanese husband have basically the same probability of working outside the home as those inmarrying (the coefficient is not significant), suggesting that Hawaiian and Japanese husbands are ranked rather equally in the marriage market among Hawaiian women. Exogamously married Hawaiian women appear to pay compensating differentials only when they marry Caucasian men. If they marry Filipino or Black husbands, they are significantly less likely to participate in the labor force, an indication that Filipino and Black husbands pay compensating differentials to their Hawaiian wives, which possibly reflects Hawaiians' prejudice against these groups.

Table 2 also shows that groom's ethnicity matters when interaction terms between groom's ethnicity and bride's education are included. In fact, when we ran simple models including

outmarriage and no such interaction, outmarriage was not significant. This implies that the low probabilities of labor force participation of Hawaiian brides marrying grooms from what appear to be lower status groups are limited to brides with low education. Likewise, outmarriage to Caucasian grooms is associated with higher labor force participation only if the bride has low education. At high levels of education, compensating differentials in marriage are eliminated.

Most of the control variables have effects on Hawaiian brides' labor force participation that are similar to those found for Caucasian brides. Notable exceptions are that bride's age and number of marriages are not significant in the regressions for Hawaiian women. However, the interaction between bride's age and outmarriage is significant.

Japanese. Our results for Japanese women are similar to those for Hawaiian women in the sense that overall the 'outmarriage' variable is not significant in Table 1 column 3. However, the interaction term between outmarriage and bride's education is positive, as was the case in the regression for Caucasian women. More insights can be derived from looking at the decomposition of groom's ethnicity introduced in Table 2, column 3. It appears from our results that Japanese women who marry Caucasians have a higher probability of working in the labor force. This is an indication that measured socioeconomic status is not the only factor at play in the marriage market. Although Japanese in general have a higher educational achievement and job prestige than Caucasians, judging from our results this does not mean that the Japanese have a higher perceived status than Caucasians in Hawaii. Comparing our results for Japanese women married endogamously and married to Caucasian men, it appears that Caucasians have a perceived status that commands compensating differentials in the marriage market that is not explained by measured group differences in education and job prestige.

As for outmarriage to other ethnic groups, the coefficients reported in Table 2 column 3 are

mostly insignificant. Another exception is the negative coefficient of bride's education and black. Highly educated Japanese brides married to Black grooms appear less likely to participate in the labor force than highly educated endogamously married Japanese brides, possibly implying that Black grooms marrying Japanese brides pay compensating differentials.

Filipinos. Filipino brides seem to have a unique pattern of labor force participation. In contrast to the other three groups, bride's education is associated with lower labor force participation for Filipinos. Whereas Caucasian brides in their second marriage are less likely to participate in the labor force, the opposite is true among Filipino brides. These differences prompted us to further examine the Filipinos in Hawaii. In contrast to the other racial/ethnic groups in Hawaii, a large fraction of the Filipinos are recent immigrants. The majority of Hawaiian and Japanese brides (99.0% and 69.4%) have at least one parent who was born in Hawaii, while this percentage for Filipino brides is only 36.6%. The Hawaiians and Japanese embrace the local island culture more closely than the Filipinos, whose family roots in the islands are not as deep. Filipinos speak a different first language, have a much lower socioeconomic status upon landing in their host country, and typically take menial jobs with low pay.

This knowledge helped us to explain the following finding: outmarrying Filipino brides are less likely to participate in the labor force (see Table 2, column 4), which is different from what we had expected for a group of comparatively low status. We also find that outmarrying Filipino brides who are more educated participate more in the labor force. These results are in fact influenced by the high representation of relatively recent Filipino arrivals to Hawaii. Intermarried Filipino women may have arrived recently as brides and may have fewer contacts and less knowledge of English than endogamously married Filipino women, thus being less likely to participate in the labor force. Similarly, it was found that women who had immigrated earlier to Israel or were born in Israel were

less likely to participate in the labor force (Grossbard-Shechtman & Neuman 1988). However, if they are highly educated, those newly arrived brides may know English better and be more likely to find jobs. When we estimated our model for a sub-sample that only included first generation Filipino brides, we obtained results similar to those reported in Table 2. However, in testing another sub-sample that only had Filipino women whose parents were born in Hawaii and who therefore are culturally similar to the rest of the Hawaiian population, we obtained findings similar to those we found for Hawaiian brides. To compare the influence of parents' birthplace on patterns of mate selection and labor force participation, we performed the same test on Caucasian and Japanese brides as we did on Filipino brides, but found no effect.

In sum, Prediction 1 derived in the previous section was supported by our data analysis for Caucasians, Hawaiians, Japanese brides, and assimilated Filipino brides. However, it was not supported by data for Filipino brides who had either migrated or were children of recent immigrants. Our interpretation of the results is as follows: due to ethnic discrimination and the marriage market mechanism, husbands from low-status groups seem to pay compensating differentials when they outmarry wives from a group of higher status. Relative to wives from lower status groups, wives from higher status groups then have more opportunities not to work in the labor force at the time of marriage. As we predicted (Prediction 3) this finding is mostly limited to brides of lower education, who are most likely to prefer traditional gender roles, and to work out of financial necessity rather than for career considerations. Wives of a lower status group, the Hawaiians, also appear to pay compensating differentials when marrying Caucasian husbands. Again, this finding is limited to women with lower education who are less motivated by the intrinsic values of work. Using data on women's labor force participation, we also found evidence suggesting a ranking of the various ethnicities in Hawaii (Prediction 2). Accordingly, the Japanese are either like Caucasians, or ranked

between Caucasians and Hawaiians and Blacks.

An alternative explanation for the results for Hawaiian and Japanese women is inspired by network theory.¹⁵ Women who are in the labor force are more likely to outmarry because they meet more people from other ethnic groups. Women who do not work are more likely to stay in their local neighborhood and to marry men from the same ethnicity. However, such explanation based on reversed causality and network theory would not explain (1) why Caucasian women who participate in the labor force are less likely to outmarry, and (2) why our exogamy findings hold better for women with low education. In contrast, predictions 1 to 3 simultaneously help explain the behavior of Caucasian women and that of women who are generally considered as being part of minorities, and we explain the important educational interaction terms reported here.

Conclusions

In this article we tested predictions regarding compensating differentials in marriage and women's labor force participation, predictions that follow from a marriage market analysis. According to this analysis, and assuming a preference for household production benefiting oneself, women from higher status ethnic groups who marry exogamously are less likely to participate in the labor force than women from that same group who are marrying endogamously. Tradition-bound women from ethnic groups with higher status who marry tradition-bound men seem to translate their group's relative market value into a stay-home lifestyle. In accordance with this prediction, we found that in Hawaii Caucasian women were less likely to participate in the labor force if they married out of their ethnic group, an indication that they earn compensating differentials in the marriage market in line with their perceived higher status in Hawaii. Our findings also support the prediction derived in this article that if there are three or more groups in the marriage market, the compensating

differentials received by outmarrying women from a high status group are likely to vary with the relative perceived status of their husband's group. In the context of Hawaii, higher compensating differentials appear to be paid by Black, Hawaiian or Filipino men marrying Caucasian women relative to the differentials paid by Japanese men marrying Caucasian women. Likewise, our findings suggest patterns for Hawaiian and Japanese women depending on the groom's ethnicity and consistent with what other studies indicate about the relative marriageability of the various ethnic groups.

Our findings are consistent with a pattern of status compensation in outmarriage that allows brides of low education from a high-status group not to work in the labor force at the time of marriage. What allows brides to obtain such compensation is the status values assigned to various ethnic groups by all participants in Hawaii's marriage market. These assigned values appear to be correlated with measured socioeconomic status, but not always. For instance, after controlling for education and job prestige, we found that Japanese brides who marry Caucasian men appear to pay compensating differentials in comparison to inmarrying Japanese brides. If such compensations indeed occur, they would not be based on inferior accomplishments of the Japanese in Hawaii. In fact, on average the Japanese in Hawaii have higher education and job prestige than Caucasians. (This is also the case with Japanese Americans in the United States in general). It is possible that ethnic status is a function not only of an ethnic group's accomplishments, but also of their minority status. In that respect, our finding about the Japanese in Hawaii is reminiscent of previous findings regarding outmarriages of Jewish men. In the United States prior to the 1970s Gentile women who married men defined ethnically as Jews were exchanging their relatively desirable ethnic/religious status for Jewish men's relatively desirable characteristics measured in terms of education and number of previous marriages (Grossbard-Shechtman 1993, Chapter 8). Also, among Israeli Jews,

the relatively lower status of Sfaradic Jews relative to that of Ashkenazi Jews could explain results from regressions of women's labor force participation (Grossbard-Shechtman & Neuman 1988) interpreted according to a marriage market analysis.

One limitation of this study is the lack of direct measurement of income and wages. Our results indicate that one factor that allows women of low education to stay out of the labor force is the receipt of compensating differentials in marriage. Given that we do not have good measures of income, low education could also indicate low income or low wages. Our study would have been more convincing if our data had a direct measure of income and wages for both husband and wife. We hope that future studies can use richer data sets--including panel data--to further explore how the presumed value of ethnicity in marriage markets is related to women's choice to participate in the labor force. Another interesting idea for future work is to analyze data similar to ours for different state and to include the size of the marriage pool of various ethnic groups into the analysis.¹⁶

We hope that the ideas presented in this paper will inspire others to test not only women's labor force participation and outmarriage, but also related topics such as outmarriage and men's labor force participation, outmarriage and other measures of the labor supply of both men and women, or outmarriage and other types of behavior likely to be correlated with compensating differentials in marriage, such as predicted divorce, control over money, or individual consumption by husbands and wives.

The predictions that were tested in this paper were derived from a marriage market analysis of marriage. We can't prove that such markets exist and establish quasi-wages for Work-In-Marriage, as was postulated in the theoretical section. But are there better explanations for our results?

Notes

¹ Earlier versions of this paper were presented at meetings of the Population Association of America (Washington, March 2001) and the Society for the Advancement of Behavioral Economics (Washington, June 2001). We thank anonymous referees, Barbara Bergmann, and David Ribar for helpful comments.

² High ethnic residential concentration often reduces opportunities of intergroup interactions (Boissevain 1974; Jackson, Fischer & Jones 1977; Ridley & Avery 1979; Spickard 1989; Tucker & Mitchell-Kernan 1990).

³ The percentage of outgroup marriage increases for a group as the proportion of this group in the marriage market decreases (Adams 1937; Blau 1977; Blau, Blum & Schwartz 1982; Blau & Schwartz 1984; Blau, Becker & Fitzpatrick 1984; Schoen 1986; Fu & Heaton 1997). The inverse relationship between outmarriage and group size explains why (1) virtually all ethnic minorities in the U.S. have interracial marriage rates considerably higher than that of Caucasians, the largest group (Hollingshead 1950; Barnett 1962; Heer 1962, 1966; Rosenthal 1963; Thomas 1972; Blau, Blum & Schwartz 1982; Gurak & Fitzpatrick 1982; Labov & Jacobs 1986; Heaton 1990; Tucker & Mitchell-Kernan 1990; Kalmijn 1993; Fu & Heaton 1997), and (2) a high intermarriage rate is more likely to be observed where there are multiple racial groups than where there are only two (Spickard 1989; Fu & Heaton 1997).

⁴ Other economics theories of marriage include Apps (1981), Chiappori (1992), Lundberg & Pollak (1993), and Woolley (1988). Various economic theories of marriage are surveyed and compared in Bergstrom (1997), Brien and Sheran (forthcoming) and Grossbard-Shechtman

(forthcoming).

⁵ Another implication of a marriage market analysis is that individuals who personally do not share racist views may still obtain a price or pay a price in the marriage market depending on how other people consider their race. This creates opportunities for members of the dominant group without racist tendencies to marry individuals with highly valued attributes who have limited choices in marriage due to their perceived low ethnic status (Grossbard-Shechtman 1993, Chapter 8).

⁶ This model is based on Grossbard-Shechtman (2001). In turn, Grossbard-Shechtman (2001) is based in part on Robbins (1930) and Reuben Gronau (1977).

⁷ A full model also leads to the derivation of demands for Work-In-Marriage and general equilibrium conditions.

⁸ This implies a different utility function. A formal derivation of this case is beyond the scope of this paper.

⁹ Job prestige scores are assigned for the job categories as follows (see Treiman 1977): Professional (5.9), Managerial (5.0), Clerical (4.0), Craftsman (3.9), Operative (3.0), Private service (2.8), Laborer (2.0), Military (4.2), and No occupation (0).

¹⁰ This follows a methodology first presented in Grossbard-Shechtman and Neuman (1988).

¹¹ Examples of labor supply models including wage estimated according to this equation include Gronau (1981) and Grossbard-Shechtman and Neuman (1988). Education is an important predictor of predicted prestige, as is the case of predicted wage in standard labor force participation equations. The total effect of education in our regressions of labor force participation will include its direct effect and its indirect effect on prestige. In our analyses controlling for estimated prestige, we will focus on the effect of education beyond the effect on

occupational prestige, which is appropriate in this case as the effect of education on gender roles and racial discrimination is likely to be separate from its effect on occupational choice.

¹² Grossbard-Shechtman and Neuman (1988) tested for compensating differentials in marriage and labor force participation using a sample restricted to women who all had a high school education or less.

¹³ The coefficients of the logit regression were linearized. The linearized coefficient of the outmarriage dummy was -1.01 and the linearized coefficient of the interaction between years of schooling and outmarriage was $.07$.

¹⁴ For an interesting interpretation of the product of husband's and wife's education on divorce probability, see Evelyn Lehrer (forthcoming).

¹⁵ We thank a referee for this idea.

¹⁶ We thank a referee for this idea.

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