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An Empirical Analysis of Same-sex and Opposite-sex Couples: Do 'Likes' Still Like 'Likes' in the '90s?

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Abstract

We use 1990 census data to test Becker's predictions of gender-based specialization for labor-market outcomes by comparing the matching behaviors of four types of couples: same-sex male couples, same-sex female couples, opposite-sex cohabiting couples, and married couples. Correlations and conditional logit results support Becker's predictions of positive assortive mating but not negative assortive mating, nor do they find marked differences across types of couples. Binary logit results show that married couples are more alike than unmarried couples, and that opposite-sex couples are more alike than same-sex couples.

I. Introduction

Although the process of selecting a lifetime companion has been discussed by economists for many years (most notably by Gary Becker in his *Treatise on the Family* (1991)), a comparison of same-sex to opposite-sex couples based on Becker's famous theories of specialization has yet to appear in the economics literature. Instead, the focus has been only on married couples, despite the substantial growth of unmarried couples over the last 30 years.

Even the definition of who constitutes a "couple" has evolved. Two recent court decisions have broadened the legal rights of same-sex couples in North America. In May 1999, the Canadian Supreme Court voided the heterosexual definition of spouse, thereby granting legal protection for same-sex couples. In December 1998, an appeals court in Oregon extended spousal benefits to partners of lesbian employees.

The existence of similarities and/or differences between same-sex and opposite-sex couples is a matter of debate. Some claim that homosexuals are fundamentally different from heterosexuals, and thus their unions are also fundamentally different. A staff psychologist, Dr. Mark Freedman, writes that "Gay people are different from other people and it would be silly to deny it" (1975). An economist, Dr. M.V. Lee Badgett, writes that "existing studies clearly suggest that lesbians are not just like single straight women and men or heterosexual partners in regard to economic behavior" (1992).

For these reasons, the similarities and/or differences between same-sex couples and opposite-sex couples, as well as between married and unmarried couples, affords critical information to people engaged in the above policy debate. Economists such as Becker offer a framework for the discussion of traditional and non-traditional couples. Specifically, Becker models the process of selecting a mate as similar to the process of selecting any other consumer good designed to increase a person's level of happiness or utility (1974). An individual maximizes his or her utility by selecting a mate based on the set of characteristics that the prospective mate possesses. Prospective mates in a competitive marriage market seek out partners with similar characteristics for qualities that are complements—Becker predicts positive assortive mating with respect to traits such as race, education, etc. Partners seek out mates with opposite characteristics for qualities that are substitutes—Becker predicts negative assortive mating with respect to wages as a direct result of the sexual division of labor. Thus, Becker derives an economic theory that explains the well-documented phenomenon that people tend to marry people like themselves with respect to most traits.

Even though the primary focus of his analysis is male/female couples, Becker briefly discusses same-sex couples, commenting that these types of households are "less efficient because they are unable to profit from the sexual difference in comparative advantage" (Becker 1991, 38-39). This reasoning suggests that although wages would be substitutes for male/female couples, they would be less so for male/male or female/female couples.

Although the "testability" of Becker's theories is a subject for debate among economists, this paper tests the predictions of his theories regarding matching patterns of couples. Specifically, we compare observable matching behaviors of four types of couples: same-sex male couples, same-sex female couples, cohabiting but not married opposite-sex couples, and married opposite-sex couples, paying special attention to the suggested differences between same-sex and opposite-sex couples with respect to wage-matching patterns.

One strength of our analysis comes from the ability to compare different types of couples in an attempt to isolate factors that affect matching behaviors. Studies that consider only male/female couples cannot easily distinguish between behaviors driven by the sex of an individual and behaviors driven by the gender-role of the individual. Another strength of the analysis is the data used. The 1990 census contains observations from all states, provides a large sample size, and elicits data on couples without either targeting "marital" behaviors or emphasizing sexual orientation.

We use three methods to test for positive and negative assortive mating. The first considers the correlation of traits within couples. Positive correlation is expected for traits that are complements, and negative correlation is expected for traits that are substitutes. The second uses conditional logit models to see if traits are more closely correlated within couples than across pairs of individuals who are not couples. The idea is that if "likes" match with "likes," then a person will be more similar to his or her mate than to a random individual. The third uses binary logit models to compare actual couples, in order to see if certain couples are more alike (or less alike) than other couples.

A model of simple correlations finds positive correlations for all traits, including earnings. The conditional logit models also provide evidence of positive assortive mating. Age, race, and education have the strongest effects on predicting matches, whereas the effects of investment income, earnings, and hours are smaller but still positive. A second conditional logit model finds that "traditional" matches are more probable with respect to age, education, and investment income. The fact that the "traditional" earnings variable (where the man earns more than the women) is not significant for married couples further weakens Becker's theories of labor-market specialization. The binary logit models show that opposite-sex couples are slightly more alike than same-sex couples; married couples are more similar than unmarried couples.

The organization of the paper is as follows. The next section is a literature review. Section III provides a brief discussion of Becker's theory of marriage. Section IV describes the methodology, and section V details the data set and descriptive statistics. Section VI reports the results, and section VII concludes.

II. Literature Review

Empirical papers by economists in the area of marriage and matching are rare. Although more plentiful in sociology journals, most of these papers test specific (single) variables related to marriage. With the exception of Suen and Lui (1999), a multivariate analysis considering a broad spectrum of traits of both partners simultaneously is absent from the literature.

Suen and Lui (1999) investigate the efficiency of marriage markets in Hong Kong. The authors use a model for spouse selection that, with some assumptions, reduces to a Tobit model. They use a small set of characteristics on a sample of recently married couples from the 1976 Hong Kong census. They find positive assortive mating for age, education, predicted wage, and being born in China. The authors use a computer algorithm to generate imputed marital output for each possible combination of men and women in their sample. Then, Suen and Lui (1999) compare the imputed marital output to actual marital output and find that the marriage market in Hong Kong is 80 percent efficient.

Sociologists long have studied the relationships of specific traits within couples (usually married couples). Many studies provide evidence of positive assortive mating (the pairing of "likes" with "likes") for a wide variety of traits from physical attractiveness (Stevens, Owens, and Schaefer, 1990) to education (Stevens, Owens, and Schaefer, 1990; Lam and Schoeni, 1994) to weight (Schafer and Keith, 1990). Some studies consider the relationship of different traits across partners within couples. This is the "rich man/attractive wife" idea that individual characteristics may be substitutable within a couple. After controlling for the effects of positive assortive mating, the Stevens, Owens, and Schaefer study (1990) finds no indication that more education could substitute for attractiveness within a couple.

A few studies have focused on the relationship of traits within same-sex couples. Recent work by Black et al. (1999) studies the demographics of gays and lesbians. Laner (1977) suggests that the traits viewed as desirable in a mate (attractiveness, honesty, or a good sense of humor) vary by sexual orientation. She finds that gay men value intelligence more and appearance less than heterosexual men. Blumstein and Schwartz (1983) survey the same four types of couples described in this study. However, their survey was advertised, not randomly collected. Their results are similar to our results, finding some differences across types of couples, yet many similarities. Klawitter (1995) also samples same-sex and opposite-sex couples from the 1990 census, finding evidence of positive assortive mating for age, race, and education. However, her analysis is limited to cross-tabulations within couples.

A recent set of papers focuses on gay and lesbian individuals in comparison to heterosexual individuals. The topics of these papers include geographic living preferences

(Black, et al., 1998a) and wage discrimination (Badgett, 1995; Black et al., 1998b). However, these papers focus on individuals rather than couples. In addition, the sample sizes used in the empirical analyses are small – under 75 homosexual and bisexual individuals in each regression in Black et al., 1998b.

Many studies that focus on cohabitation (in opposite-sex couples) generally focus on whether cohabitation is viewed by couples as a trial marriage. One method for testing this theory is to see if couples who cohabited prior to marriage have lower divorce rates than couples who did not live together prior to marriage. Several studies suggest that couples who cohabit before marriage are less happy in their marriages and are more likely to divorce than those couples who did not cohabit (Thomson and Colella, 1992; and Trussell and Rao, 1989). However, White (1989) finds that when controlling for age at marriage and marital cohort, cohabitation has no effect on marital stability.

The vast majority of economic research concentrates on married couples. Other than Black et al. (1999), Klawitter (1995), and Blumstein and Schwartz (1983), none of the studies of non-traditional couples compares married to unmarried couples, including same-sex couples. When comparing cohabiting to married couples, one of the most common questions asked by researchers concerns the relative "stability" of cohabiting couples. Married couples are perceived to be more stable, and employers may even act on this belief—one possible interpretation of the "marriage premium" found by Korenman and Neumark (1991), if one believes that the higher performance evaluations for married versus single men could be influenced by employer perceptions of stability (these authors' suggestion).

III. Becker's Theory of Marriage and Matching

Becker views the marriage market as analogous to more traditional economic markets. He begins with two assumptions. First, marriage is voluntary—marriage occurs only if the utility of being married is higher than the utility of remaining single for both people. Second, competition among singles seeking mates gives rise to a competitive marriage market. For each household, utility is a function of household production (Z), which is a function of goods and time. Examples of goods produced in the household include home-cooked meals, children, love, and companionship. Households maximize utility [U(Z)] subject to a standard full-income budget constraint.

Becker represents a competitive marriage market through a matrix, where F_1 is the first female, F_n is the *n*-th female, M_1 is the first male, M_n is the *n*-th male, Z_{11} is the household output of the "marriage" of F_1 with M_1, and Z_{12} is the household production of the "marriage" of M_1 with F_2, etc. Becker lets men and women differ with respect to a specific trait such as age or race, which he calls A. He denotes a male with characteristic A as A_m and a female with characteristic A as A_f. He treats A_m and A_f like inputs in a production function. Also, Becker assumes that incremental changes in each trait affect household production (output) monotonically. The marriage market functions by choosing the optimal combination of M_i with F_j to maximize the total production of all households—that is, to maximize the sum of the Z_{ij}s. That is,

$$(1) \quad \frac{f Z_{ij}(A_m, A_f)}{f A_m} > 0 \text{ and } \frac{f Z_{ij}(A_m, A_f)}{f A_f} > 0.$$

This maximization process generates the following results, which Becker proves. If

(2) $$\frac{f^2 Z(A_m, A_f)}{f A_m f A_f} > 0,$$

then positive assortive mating is optimal. If

(3) $$\frac{f^2 Z(A_m, A_f)}{f A_m f A_f} < 0,$$

then negative assortive mating is optimal. Thus, positive assortive mating is optimal when traits are complements, and negative assortive mating is optimal when traits are substitutes. Becker views traits like age, education, race, and religion as complements; wages may be substitutes if women specialize in home production and if male wages are higher than female wages, on average.

According to Becker, the key to whether a trait is a substitute or a complement is how the trait affects household production. Specifically, if increasing amounts of a trait, such as more education, add more to total household output (Z) than adding amounts separately, the traits are complements, thus predicting the pairing of “likes” with “likes.” Conversely, if increasing amounts of a trait add less to total household output than adding amounts separately, then the traits are substitutes, thus predicting the pairing of unlikes. Becker (1991) bases his conclusion of negative assortive mating as an optimization strategy with respect to wages (and possibly hours) on the sexual division of labor within families. Through his classification of traits that have reinforcing effects versus offsetting effects, Becker predicts positive assortive mating with respect to traits such as age, race, education, and investment income, and predicts negative assortive mating with respect to wages and possibly hours.

Becker's prediction of negative assortive mating with respect to wages results from his gender-specific theory of labor-market specialization.

> From biological differences emerges the not-very-startling conclusion that the sex of household members is an important distinguishing characteristic in the production and care of children, and perhaps also in other household commodities and in the market sector. … If women have a comparative advantage over men in the household sector when they make the same investments in human capital, an efficient household with both sexes would allocate the time of women mainly to the household sector and the time of men mainly to the market sector (1991, p. 38).

Becker does not restrict his analysis to male/female couples. Although the previous discussion predicts negative assortive mating with respect to hours for opposite-sex couples, the result is less clear for same-sex couples. Becker notes,

> Households with only men or only women are less efficient because they are unable to profit from the sexual difference in comparative advantage. Consequently, biological differences in comparative advantage between the sexes explain not only why households typically have both sexes, but also why women have usually spent their time bearing and rearing children and engaging in other household activities, whereas men have spent their time in market activities (1991, pp. 38-39).

While Becker's theories provide the theoretical basis for our research, the methods described below test for evidence of both his predictions for positive and negative assortive mating with respect to specific traits and his suggestions of strong differences between same-sex and opposite-sex couples.

IV. Methodology

Although Becker predicts positive and negative assortive mating for a variety of personal characteristics, he does not specify a particular model to test his predictions. Because Becker does discuss the correlation of traits within couples, our first method measures the correlation of traits within couples for the four types of couples under study: same-sex men, same-sex women, cohabiting opposite-sex couples, and married couples. The correlations provides a good starting point for the analysis—Becker's theory predicts positive correlation coefficients for age, race, education, and investment income and negative correlation coefficients for wages and hours. The correlations, however, do not control for the effects of other variables on the match. In our second method, we use a conditional logit to compare actual couples with randomly created (artificial) couples to see if the actual couples are more similar with respect to traits that are complements and are more different with respect to traits that are substitutes than random pairings. Our third and final method uses two binary logit models to extend the analysis by comparing across couple types, restricting the sample to actual couples.

Correlations

The first method considers the correlation between the various characteristics within partnerships, using a Pearson correlation matrix. If people choose partners with similar characteristics with respect to age, race, education, and investment income, as Becker's theory predicts, then we expect positive correlation coefficients for these variables. If couples specialize in home and market production, then we expect negative correlation coefficients for hours and earnings. If this specialization is driven by the legal aspects of marriage, then we expect negative correlation coefficients for the married couples but positive correlation coefficients for the other couples. If specialization is driven by the sex composition of the couple, then we expect negative correlations only for the opposite-sex couples. Finally, if same-sex couples role-play, adopting traditional "male" and "female" roles, then we might observe negative correlations for hours and earnings across all couples.

Conditional Logits

The conditional logit models test whether or not people participating in cohabiting and married relationships are (statistically) more similar to their mates than to another potential mate. These models capture the impact of the various traits on the probability of two people choosing each other as partners. The conditional logit, described in equation (4), is appropriate when the choices under study are the "characteristics of the alternative" rather than the "characteristics of the chooser" and when the "chooser" chooses among a set of characteristics of different alternatives in order to maximize utility:

$$(4) \quad \text{Prob}\,(Y_i = j) = \frac{e^{\mathrm{B}'x_{ij}}}{e^{\mathrm{B}'x_{ij}}},$$

where i is an individual subscript, j is an alternative's subscript, and x_{ij} is the vector of characteristics of the couple created by matching person i and alternative j. The difference between a conditional logit and a multinomial logit is illustrated by the following comparison. In a model to predict the probabilities of a person choosing where to live, the multinomial logit uses the characteristics of the chooser, such as age, race, and gender to predict the location, whereas the conditional logit uses characteristics of the choice, such as weather, housing prices, and crime rates, to predict the location choice.[1] In a marriage model, a multinomial logit would model the characteristics of the chooser only (such as the age, race, and education of the chooser) to predict the selection of a mate. The conditional logit uses the characteristics of the choices (such as the age, race, and education of prospective mates) to predict the selection of a mate. Using the differences in traits allows us to compare the relationships of the traits of the choices to the traits of the chooser, an important step in creating a realistic model.

The application of a conditional logit model to the process of choosing a partner requires several steps. The first is to define the independent variables to capture the effects of a potential partner's characteristics in relation to the chooser's characteristics. The next step is to define the alternatives over which the chooser selects. The last step is to evaluate the predicted effects of the independent variables on the alternatives in a way that is consistent with Becker's predictions of positive and negative assortive mating.

First, the observable characteristics available from the data set include age, race, years of schooling, earnings, investment income, hours worked, and occupation. Because the choice of spouse/partner likely depends not only on the characteristics of the potential mate, but also on how those characteristics relate to the characteristics of the "chooser," we define the independent variables to be the absolute value of the difference between the partner's and the chooser's characteristics.

The next step is to specify the alternatives for the chooser, given that we observe only the outcome of the choice—the made match. We know whom a person chose as his/her partner but not who was considered prior to the final choice. Since the data set does not

[1] J.S. Butler suggested this example.

contain information about who was rejected in a "marriage" search, a set of "rejected" (artificial) matches is created. Each "rejected" match consists of an individual (head of household) paired with a randomly selected individual within the same type of couple and with the same gender preference for a partner, but who is not the person's mate.[2]

Finally, the predicted effects of the characteristics suggest an inverse relationship between characteristics that are complements and the probability of a couple being a "natural" couple. For example, if people want a mate close to their own age, we would expect to observe small differences in age within couples. If age is a complementary trait, then a small difference in age would be more likely to predict a pairing. The predicted effects suggest a positive coefficient for characteristics that are substitutes and the probability of being a natural couple. For example, if high-wage married men are more likely to be paired with low-wage wives (as Becker's theory predicts), then the greater the difference between the husband's and wife's earnings, the more likely they are to be a married couple, ceteris paribus. Thus, we would expect negative coefficients for the variables age, race, education, and investment income and positive coefficients for the variables wages and hours.[3] If we find negative coefficients on the variables wages and hours for same-sex couples, but positive coefficients for opposite-sex couples, these results would support a gender-specific

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[2] Artificial matches are created using the available pool of similar partners. Partners for same-sex male heads of household are selected only from same-sex male partners, not from opposite-sex men or from same-sex male heads of household. The same pairing formula applies to female same-sex couples. Partners for cohabiting male heads of household are selected from female cohabiting partners; partners for female heads are selected from male cohabiting partners. The same pairing formula applies to married couples. See Jepsen (1998) for further details on the matching algorithm. Three "artificial" matches are created for each individual. However, the results are similar to the results where only one "artificial" match is created per individual. McFadden (1973) shows that conditional logit models produce consistent parameter estimates when a random subset of the non-chosen alternatives is used.

[3] However, Lam (1988) suggests an explanation for positive assortive mating with respect to wages if "household public goods are jointly consumed" (p. 464).

specialization of labor theory by providing evidence that opposite-sex couples can specialize, whereas same-sex couples cannot.

Equation (5) provides a detailed description of the components of the conditional logit model represented by equation (4):

(5) $Z = \beta_1\text{age} + \beta_2\text{race} + \beta_3\text{schooling} + \beta_4\text{earnings} + \beta_5\text{investment income} + \beta_6\text{hours} + \beta_7\text{blue collar} + \beta_8\text{white collar} + \varepsilon$,

where Z takes on the value of one for a "natural" couple and the value of zero for an "artificial" couple, and the variables are defined as the absolute values of the differences of the traits. An implicit assumption in this model is that only the difference in the values of the variables matters, not the direction of the difference. Equation (6) details an extension of the model to test whether the direction of the difference affects the probability of a natural match. The most common direction of the difference in certain variables is correlated with gender—in opposite-sex couples, we expect the men to be older and to earn more money.[4] They may also have more education and work more hours. The direction of the difference in same-sex couples is less clear. However, if we believe that the head and partner designations capture some of the gender-role effect discussed for opposite-sex couples, then we might expect the heads of households to be older, have more education, earn more money, and work more hours within the same-sex couples. The inclusion of the following dummy variables is designed to capture this "tradition" or "role" effect. Dummy variables for age, education,

[4] Bergstrom and Bagnoli (1993) explain the fact that women marry older men as a function of the relative ages at which "desirability" as a marriage partner is evident. In societies with traditional economic roles for males and females, men need more time to signal their "desirability" as economic providers. The authors also comment that this age discrepancy is diminishing over time.

investment income, earnings, and hours are defined to take on the value of one if the pairing reflects a non-traditional match, as compared to a traditional match.

(6) $Z = \beta_1\text{age} + \beta_2\text{race} + \beta_3\text{schooling} + \beta_4\text{earnings} + \beta_5\text{investment income} + \beta_6\text{hours} + \beta_7\text{blue collar} + \beta_8\text{white collar} + \beta_9\text{age}_t + \beta_{10}\text{schooling}_t + \beta_{11}\text{earnings}_t + \beta_{12}\text{investment income}_t + \beta_{13}\text{hours}_t + \varepsilon.$

For example, if a married woman is older than her husband, then the "age_t" variable equals one. If people want to follow tradition when choosing partners, then the existence of a non-traditional characteristic (such as a woman older than a man) should decrease the probability of a natural match. Thus, we would expect negative coefficients on all of these dummy variables if people want a traditional match.

Binary Logits

The binary logit models test whether or not people participating in one couple type are (statistically) more similar to their mates than people participating in another couple type. Of particular interest in the binary logit model specified in equation (7) are the following comparisons–married versus unmarried couples, and opposite-sex versus same-sex couples. In the first binary logit model, the dependent variable equals one for opposite-sex couples and zero for same-sex couples. In the second binary logit model, the dependent variable equals one for married couples and zero for unmarried couples.

(7) $$\text{Prob}(Y_i = 1) = \frac{e^{\mathrm{B}'x_i}}{1 + e^{\mathrm{B}'x_i}},$$

where i denotes the couple and x_i is a vector of characteristics for couple i. As in the conditional logit model in equation (4), the independent variables are defined to be the absolute value of the difference between the partner's and the chooser's characteristics.

An important application of the binary logit model is a comparison of which couple type is more likely to display positive assortive mating (or negative assortive mating), depending on the sign and magnitude of the marginal effect. A significant, positive marginal effect here implies that opposite-sex (married) couples are less alike with respect to that trait than same-sex (unmarried) couples.[5]

V. Data and Descriptive Statistics

The data come from the five-percent sample of the 1990 Public Use Microdata Set (PUMS) of the 1990 census for all 50 states and the District of Columbia. Observations in the data set include all same-sex, male couples (n=3,040) and all same-sex, female couples (n=2,395), and a random sample of unmarried, opposite-sex couples (n=6,118) and of married couples (n=8,545). Because we study matching on labor-market characteristics like earnings and hours, we limit our sample to couples where both individuals are age 19 to 65, are not in the military, and have no allocated values for sex or relationship to head of household.

We identify same-sex couples as those couples where the partner selects "unmarried partner" (bypassing the choice of "roommate") for the category "relationship to head of household," and both the unmarried partner and head of household have the same gender. The 1990 census is the first year that "unmarried partner" was offered as a

[5] Similarly, a negative marginal effect implies that as the couple becomes more alike (the difference decreases), the couple is more likely to be an opposite-sex (married) couple.

category for "relationship to head of household." Census documentation defines "unmarried partner" as a "person who is not related to the householder, who shares living quarters, and who has a close personal relationship with the householder," (U.S. Bureau of the Census, 1992). Given the negative stigma attached to homosexuality, the likelihood that platonic roommates would accidentally select "unmarried partner" is minimal. Cohabiting opposite-sex couples are identified as those couples where the partner selects "unmarried partner," and the partner has the opposite gender of the head of household.[6] Because the census identifies only same-sex unmarried partners and not homosexual individuals, we only consider couples. Therefore, the analyses reported below apply only to couples.

Age is measured in years. Race is a dummy variable that takes on a value of zero if the individual's race is white (Caucasian, non-Hispanic) and takes on a value of one otherwise. Schooling is the highest year of formal schooling completed (converted from census codes). Earnings is the individual's annual wage, salary, and self-employment income, measured in $1,000s. Investment income is interest, dividend, and net-rental income, also measured in $1,000s. Hours is the average number of hours worked per week. Blue collar is a dummy variable for blue-collar occupations, service is a dummy variable for service occupations, and white collar is a dummy variable for white-collar occupations. No occupation is a dummy variable to control for those individuals who do not report an occupation.

[6] Households where more than one person claims to be the unmarried partner of the head of household are not included.

Descriptive statistics are presented in Table A-1 of the appendix. The means of the variables of interest are quite similar to the means of data used in other studies of same-sex couples (Blumstein and Schwartz, 1983; and Kurdek, 1992), suggesting that the census data are comparable across many demographic variables.

VI. Results

Pearson Correlations

Table 1 reports the Pearson correlation coefficients for the variables of interest (race, age, schooling, earnings, investment income, hours, and occupation) for all four types of couples for heads of households and their partners.[7]

For the traits that Becker characterizes as complements (age, schooling, investment income, and race), we observe positive correlations. For age, the highest correlation occurs within married couples; same-sex women have the lowest correlations. With respect to schooling, the married and same-sex female couples have the highest correlation coefficients, while the same-sex male and cohabiting couples have lower correlation coefficients. Investment income is the least-correlated trait among the complements; the coefficients are similar for all four groups. For race, the married couples again have the highest correlation; the cohabiting couples and same-sex women have similar coefficients. Only the same-sex men show a correlation coefficient under 0.6, which is consistent with the fact that same-sex men have the highest percentage of inter-racial couples (as a percentage of the respective sample sizes). The results from the correlation analyses for complementary traits suggest that

[7] The authors would like to thank J.S. Butler for his assistance in calculating these standard errors. Tetrachoric

the married couples exhibit the strongest pairings of "likes" with "likes." These high coefficients set the married couples apart from their unmarried counterparts. For the unmarried couples, the same-sex women have correlation coefficients similar to the married couples for education. Stronger differences occur between married couples and unmarried couples, rather than between same-sex and opposite-sex couples.

Although Becker does not reference occupation when discussing complementary and substitutable traits, the results support occupational patterns based on gender rather than on type of couple. The same-sex couples exhibit higher correlations than do the opposite-sex couples.

For the traits that Becker characterizes as substitutes (earnings and hours), we do not find negative coefficients as might be expected. However, we do find lower correlations for the earnings and hours worked variables than those for age and education. The smallest coefficients are for the married couples. Same-sex female couples' earnings and hours are more closely correlated than the other couples' earnings and hours.[8] These results contradict Becker's suggestions that married couples have one person (most likely the woman) specializing in home production.

The correlation results provide strong support for the hypothesis that "likes" pair with "likes" with respect to age, race, education, and investment income. The positive coefficients for earnings and hours also suggest "likes" pairing with "likes" and do not support Becker's theories of substitution. The result that the coefficient on earnings is

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correlations are also estimated for the dummy variables of interest, and the results are qualitatively similar to those reported in Table 1 (see Stuart and Ord (1991) for a detailed explanation of tetrachoric correlations).

[8] These results also contradict Jensen's (1974) results that women in same-sex unions adopt "husband and wife roles" within the unions.

greatest for married couples refutes the suggestion that married couples exhibit gender-specific labor-market specialization, whereas same-sex couples do not.

Conditional Logits

The results of the conditional logit model specified in equation (5) are reported in Table 2. The negative relationship between the differences in race, age, and education between partners and the probability of being a natural couple supports Becker's predictions of positive assortive mating for these traits. The impact of these variables is significant for all four types of couples. Also, for all couples, the marginal effect of schooling is larger than that of age, indicating that similarities in years of formal schooling are a stronger predictor of being a couple than similarities in ages. The marginal effect for the same-sex female couples is larger than for the other couples. Specifically, a one-year decrease in the difference in years of schooling increases the probability of being a natural couple by 3.3 percent for same-sex men, 5.4 percent for same-sex women, 4.4 percent for cohabiting couples, and 5.0 percent for married couples.[9] These effects are roughly double the effects for age.

Becker's theory predicts that investment income is a complementary trait, thus predicting a negative coefficient in the conditional logit model. However, the magnitude of the marginal effect is very small—a $1000 increase in the difference in investment income decreases the probability of being a couple by 0.37 percent for same-sex men, 0.82 percent for same-sex women, and 0.49 percent for married couples.[10]

Earnings and hours may be substitutes, at least for the opposite-sex couples, if Becker's theories regarding the sexual division of labor hold. The coefficients on earnings are

[9] Marginal effects are evaluated at the means of the variables.

negative for all four types of couples, suggesting that "likes" pair with "likes" with respect to earnings, rather than suggesting specialization. Neither the earnings results nor the hours results support a gender-specific theory of labor-market specialization. The difference in hours worked is a significant variable for all but the married couples, which is the opposite result of a prediction that the married couples are the most likely to specialize. The coefficients are negative, supporting a positive assortive mating hypothesis. Where significant, the marginal effects are small—a one-hour decrease in the difference in hours worked within a couple increases by less than one percent the probability of being a couple.

The most interesting result is that "likes" appear to like "likes" for all traits—including hours and earnings—across all types of couples, as illustrated by the negative signs associated with all the significant coefficients and partial derivatives. These findings also hold for a multinomial logit model.[11] The partial derivatives for this model are reported in Table A-2 of the appendix.

The results for the model specified in equation (6), which includes variables to capture the effects of the pairings of people with "non-traditional" traits (such as an older woman with a younger man) are reported in Table 3. These results are similar to the results in Table 2.[12] The effects of the directional variables are as expected. For the same-sex male couples, if the partner is older than the head of household, the pair is less likely to be an actual couple. For the opposite-sex couples, if the woman is older than the man, they are less likely to be an actual couple. The magnitude of the effect for the opposite-sex couples is larger (9.2 to 17.8 percent) than for the same-sex male couples (3.6 percent). The effect of

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[10] Investment income is not significant for cohabiting couples.

[11] The main differences are that investment income is no longer significant for same-sex men and that hours are significant for all four types of couples.

the partner or woman having more schooling than the head of household is negative and significant for same-sex male and married couples.[13] The effects of investment income "tradition" variable are significant and negative for all types of couples, with the effects ranging from 8.1 to 14.3 percent.

A somewhat surprising result is that the effect of "traditional" earnings is not significant for married couples, the group most likely to exhibit traditional matching patterns. Only for same-sex male couples and cohabiting couples does the presence of the partner or woman earning more decrease the likelihood of observing an actual couple. Having the partner or woman work more hours decreases the probability of observing an actual couple for all couples. (The partial derivatives for multinomial logit model with "tradition" variables are reported in Table A-3 of the appendix). Thus, the conditional logit results refute Becker's specialization theory.

Binary Logits

Table 5 contains the results for two binary logits. In the first two columns, the dependent variable is whether or not the couple is a same-sex couple, and in the next two columns, the dependent variable is whether or not the couple is an opposite-sex married couple. Note that in this section, unlike in the previous section, only actual cohabiting couples are included in the sample: no "artificial" couples are included. This model structure only allows a comparison across types of couples, rather than an individual analysis of couple type. A significant, positive marginal effect here implies that opposite-sex (married) couples are less alike with respect to that trait than same-sex (unmarried)

[12] Investment income is no longer a significant variable for any couple.
[13] The significant, positive coefficient for the schooling "tradition" in same-sex female couples contradict

couples. The independent variables in this section are defined as in the conditional logit models—the absolute value of the difference in characteristics between members of the couple.

A positive marginal effect is consistent with opposite-sex (married) couples being more likely to have negative assortive mating than same-sex (unmarried) couples. For example, the positive marginal effect for earnings in the opposite-sex model implies that a $1000 decrease in the difference in earnings increases the probability of being an opposite-sex couple by 0.075 percent. The positive coefficients for earnings and hours suggest that opposite-sex couples are less alike with respect to these traits than same-sex couples. The negative marginal effect for age in column 2 implies that a one-year decrease in the difference in age decreases the probability of being an opposite-sex couple by 1.3 percent. Race, schooling, and investment income also have significant, negative marginal effects. These results are consistent with a theory of opposite-sex couples having more positive assortive mating than same-sex couples.

The third and fourth columns of Table 4 present the results of the logit where married is the dependent variable. Race, age, and schooling have negative, significant coefficients. A one-year decrease in the difference in age increases the probability of being a married couple by 2.5 percent. Investment income is now insignificant, while earnings, hours, and the occupational dummies are all positive and significant. Hence, married couples are more alike than unmarried couples with respect to race, age, and schooling, but less alike with respect to hours and earnings. Similar findings exist for opposite-sex couples compared with same-sex couples.

Jensen's (1974) findings that same-sex female couples behave like married couples.

Table 5 includes results for the model specification that includes variables to capture the effects of "tradition" effects. These results are similar to the results in Table 4.[14] If opposite-sex (married) couples are more "traditional" than same-sex (unmarried) couples, then these coefficients and marginal effects should be negative. In fact, all the directional dummies are negative in both models, except for schooling. For example, the female (in opposite-sex couples) or the partner (in same-sex couples) working more than the male/head decreases the probability of the couple being an opposite-sex couple by 12.9 percent. In the married model, the magnitude of the age "tradition" marginal effect is 1.1 percent. In general, the marginal effects are substantially larger (in absolute value) in the opposite-sex model than in the married model, supporting Becker's theory of specialization based on gender (rather than on marriage).

VI. Conclusion

In this paper, we extend Becker's research which predicts that "likes" will pair with "likes" with respect to certain traits, whereas "opposites attract" with respect to other traits, with a special focus on the predicted differences in labor-market matching patterns of same-sex couples as compared to opposite-sex couples. We use three methods – correlations, conditional logits, and binary logits – to test for evidence of positive and negative assortive mating with respect to a wide variety of traits across different types of couples.

The results from both the correlations and the conditional logit models find no evidence to support Becker's theory of gender-specific labor-market specialization. The findings for hours and earnings suggest that "likes" pair with "likes" for these traits. The only support for Becker comes from the binary logit results, which suggest that married

[14] In the married model, schooling and investment income are no longer significant.

couples are less alike with respect to hours and earnings when compared to unmarried couples, and opposite-sex couples are less alike with respect to these traits than are same-sex couples. The binary logit results do not contradict the other results; rather, they suggest that the magnitude of positive assortive mating for hours and earnings varies by couple type.

The lack of evidence supporting sharp differences between same-sex and opposite-sex couples provides fuel for the policy debate regarding the legalization of same-sex marriages. After all, if same-sex couples maximize their utility through positive assortive mating patterns just as opposite-sex couples do, the justifications for prohibiting such unions loses an economic basis.

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Table 1
Pearson Correlation Coefficients

	Same-Sex Men	Same-Sex Women	Cohabs	Marrieds
Race	0.3637	0.6218	0.7339	0.8254
	(0.0157)	(0.0125)	(0.0059)	(0.0034)
Age	0.5685	0.4459	0.7286	0.9094
	(0.0123)	(0.0164)	(0.0060)	(0.0019)
Schooling	0.4435	0.5767	0.5017	0.5990
	(0.0146)	(0.0136)	(0.0096)	(0.0069)
Earnings	0.2658	0.3710	0.2943	0.0521
	(0.0169)	(0.0176)	(0.0117)	(0.0108)
Investment Income	0.1964	0.1283	0.1562	0.1704
	(0.0174)	(0.0201)	(0.0125)	(0.0105)
Hours	0.2014	0.2908	0.1177	0.0891
	(0.0174)	(0.0187)	(0.0126)	(0.0107)
Blue Collar	0.2222	0.1979	-0.0161	0.0943
	(0.0172)	(0.0196)	(0.0128)	(0.0107)
White Collar	0.2798	0.3443	0.2031	0.2106
	(0.0167)	(0.0180)	(0.0123)	(0.0103)
Service	0.2185	0.1766	0.0689	0.0546
	(0.0173)	(0.0198)	(0.0127)	(0.0108)

Standard errors are in parentheses.

Table 2
Conditional Logit Results

	Same-Sex Men		Same-Sex Women		Cohabiting		Married	
Variable	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Race	-0.5167	-10.172	-1.3927	-26.906	-1.8815	-34.074	-2.2800	-34.026
	(0.0656)		(0.0934)		(0.0577)		(0.0754)	
Age	-0.0991	-1.951	-0.0919	-1.776	-0.1469	-2.661	-0.2428	-3.624
	(0.0042)		(0.0049)		(0.0037)		(0.0045)	
Schooling	-0.1679	-3.306	-0.2812	-5.433	-0.2424	-4.391	-0.3379	-5.043
	(0.0133)		(0.0166)		(0.0122)		(0.0119)	
Earnings	-0.0155	-0.306	-0.0258	-0.499	-0.0273	-0.494	-0.0054	-0.080
	(0.0016)		(0.0027)		(0.0021)		(0.0017)	
Investment Inc	-0.0188	-0.369	-0.0425	-0.820	-0.0188	-0.340	-0.0329	-0.491
	(0.0063)		(0.0142)		(0.0115)		(0.0075)	
Hours	-0.0118	-0.232	-0.0105	-0.202	-0.0040	-0.072	-0.0027	-0.040
	(0.0022)		(0.0026)		(0.0015)		(0.0014)	
Blue Collar	-0.1931	-3.801	0.0008	0.015	-0.1128	-2.042	-0.2121	-3.166
	(0.0794)		(0.0901)		(0.0476)		(0.0605)	
White Collar	-0.2947	-5.802	-0.3467	-6.699	-0.3674	-6.654	-0.2394	-3.572
	(0.0614)		(0.0721)		(0.0426)		(0.0403)	

Standard errors are in parentheses.

Marginal effects are $\delta P_j/\delta x_j = P_j(1-P_j)\beta$. Marginal effects are evaluated at the mean.

Model includes a dummy variable to control for those persons who do not report an occupation. Service occupation is the omitted category.

Table 3
Conditional Logit Results (with "Tradition" Variables)

	Same-Sex Men		Same-Sex Women		Cohabiting		Married	
Variable	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Race	-0.5604	-10.945	-1.3807	-26.491	-1.8541	-32.933	-2.2878	-31.406
	(0.0659)		(0.0936)		(0.0581)		(0.0784)	
Age	-0.1013	-1.978	-0.0927	-1.778	-0.1472	-2.615	-0.2383	-3.271
	(0.0042)		(0.0049)		(0.0037)		(0.0046)	
Schooling	-0.1553	-3.033	-0.2971	-5.701	-0.2306	-4.096	-0.3137	-4.307
	(0.0140)		(0.0178)		(0.0130)		(0.0130)	
Earnings	-0.0137	-0.267	-0.0254	-0.488	-0.0296	-0.526	-0.0079	-0.109
	(0.0017)		(0.0027)		(0.0021)		(0.0018)	
Investment Inc	-0.0056	-0.109	-0.0521	-0.999	-0.0084	-0.149	-0.0118	-0.162
	(0.0062)		(0.0149)		(0.0114)		(0.0077)	
Hours	-0.0112	-0.220	-0.0108	-0.207	-0.0035	-0.061	-0.0026	-0.035
	(0.0023)		(0.0027)		(0.0015)		(0.0015)	
Blue Collar	-0.1988	-3.883	-0.0145	-0.278	-0.1355	-2.407	-0.2223	-3.052
	(0.0798)		(0.0905)		(0.0484)		(0.0638)	
White Collar	-0.3495	-6.825	-0.3346	-6.419	-0.3171	-5.632	-0.2394	-3.287
	(0.0618)		(0.0723)		(0.0432)		(0.0426)	
Age_t	-0.1856	-3.624	-0.0249	-0.477	-0.5152	-9.151	-1.2952	-17.780
	(0.0541)		(0.0635)		(0.0426)		(0.0459)	
$School_t$	-0.2380	-4.648	0.2232	4.282	-0.0238	-0.423	-0.1243	-1.707
	(0.0629)		(0.0701)		(0.0479)		(0.0514)	
$Earnings_t$	-0.2510	-4.901	0.1317	2.527	-0.3519	-6.251	-0.0028	-0.038
	(0.0636)		(0.0708)		(0.0520)		(0.0652)	
Investment Inc_t	-0.4167	-8.138	-0.7430	-14.255	-0.5919	-10.513	-0.6316	-8.670
	(0.0700)		(0.1099)		(0.0820)		(0.0796)	
$Hours_t$	-0.2719	-5.311	-0.0269	-0.515	-0.2000	-3.553	-0.2639	-3.622
	(0.0636)		(0.0758)		(0.0594)		(0.0728)	

Standard errors are in parentheses.
Marginal effects are $\delta P_j/\delta x_j = P_j(1-P_j)\beta$. Marginal effects are evaluated at the mean.
Model includes a dummy variable to control for those persons who do not report an occupation. Service occupation is the omitted category.

Table 4
Binary Logit Results

	Opposite-Sex		Married	
Variable	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Race	-0.5767	-10.275	-0.7853	-19.032
	(0.0566)		(0.0630)	
Age	-0.0751	-1.339	-0.1046	-2.535
	(0.0031)		(0.0037)	
Schooling	-0.0467	-0.833	-0.0221	-0.536
	(0.0096)		(0.0089)	
Earnings	0.0042	0.075	0.0148	0.358
	(0.0008)		(0.0008)	
Investment Inc	-0.0209	-0.372	-0.0020	-0.048
	(0.0028)		(0.0029)	
Hours	0.0172	0.307	0.0126	0.305
	(0.0012)		(0.0010)	
Blue Collar	1.1584	20.640	0.2298	5.570
	(0.0459)		(0.0355)	
White Collar	-0.0088	-0.157	0.1582	3.833
	(0.0423)		(0.0351)	

Standard errors are in parentheses.
Marginal effects are $\delta P_j/\delta x_j = P_j(1-P_j)\beta$. Marginal effects are evaluated at the mean.
Model includes three Census region dummy variables and a dummy variable to control for those persons who do not report an occupation.

Table 5
Binary Logit Results (with "Tradition" Variables)

	Opposite-Sex		Married	
Variable	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Race	-0.5480	-9.427	-0.7514	-18.134
	(0.0581)		(0.0642)	
Age	-0.0795	-1.368	-0.1077	-2.600
	(0.0032)		(0.0038)	
Schooling	-0.0615	-1.057	-0.0149	-0.359
	(0.0102)		(0.0096)	
Earnings	0.0018	0.030	0.0124	0.298
	(0.0008)		(0.0008)	
Investment Inc	-0.0163	-0.281	0.0037	0.089
	(0.0029)		(0.0029)	
Hours	0.0208	0.357	0.0138	0.334
	(0.0013)		(0.0011)	
Blue Collar	1.1142	19.167	0.1535	3.704
	(0.0473)		(0.0367)	
White Collar	-0.0006	-0.011	0.1880	4.537
	(0.0436)		(0.0361)	
Age_t	-0.6121	-10.531	-0.7320	-17.664
	(0.0390)		(0.0382)	
$School_t$	0.3077	5.293	0.0318	0.768
	(0.0415)		(0.0368)	
$Earnings_t$	-0.3344	-5.753	-0.2856	-6.892
	(0.0424)		(0.0420)	
Investment Inc_t	-0.4351	-7.484	-0.6156	-14.856
	(0.0536)		(0.0569)	
$Hours_t$	-0.7513	-12.925	-0.6005	-14.491
	(0.0454)		(0.0468)	

Standard errors are in parentheses.
Marginal effects are $\delta P_j/\delta x_j = P_j(1-P_j)\beta$. Marginal effects are evaluated at the mean.
Model includes three Census region dummy variables and a dummy variable to control for those persons who do not report an occupation.

Appendix Table A-1
Descriptive Statistics

	Male Head	Male Partner	Female Head	Female Partner	Cohab Head	Cohab Partner	Married Head	Married Partner
Race	0.891	0.822	0.838	0.830	0.770	0.762	0.846	0.840
	(0.312)	(0.383)	(0.368)	(0.376)	(0.421)	(0.426)	(0.361)	(0.366)
Age	37.50	34.63	37.09	34.23	34.16	32.55	42.64	40.41
	(9.45)	(9.00)	(9.61)	(8.70)	(9.90)	(9.60)	(11.37)	(11.06)
Schooling	14.60	14.03	14.28	14.19	12.56	12.35	12.96	12.76
	(2.39)	(2.40)	(2.74)	(2.50)	(2.34)	(2.27)	(2.71)	(2.35)
Earnings	32.57	22.92	24.48	19.50	20.18	14.18	30.20	12.05
	(30.44)	(22.41)	(21.01)	(16.93)	(20.93)	(14.75)	(29.22)	(16.22)
Investment Inc	2.06	0.87	1.29	0.56	0.60	0.24	1.40	0.42
	(7.53)	(4.90)	(5.72)	(2.96)	(3.67)	(2.14)	(5.77)	(3.27)
Hours	40.87	38.30	38.22	36.43	37.98	34.74	40.30	26.65
	(13.56)	(14.77)	(14.53)	(15.32)	(15.96)	(17.14)	(16.26)	(19.07)
Blue Collar	0.121	0.142	0.126	0.149	0.380	0.318	0.425	0.134
	(0.326)	(0.349)	(0.332)	(0.357)	(0.485)	(0.466)	(0.494)	(0.340)
White Collar	0.768	0.694	0.728	0.695	0.448	0.446	0.458	0.577
	(0.422)	(0.461)	(0.445)	(0.461)	(0.497)	(0.497)	(0.498)	(0.494)
Service	0.090	0.136	0.114	0.110	0.125	0.174	0.077	0.123
	(0.286)	(0.342)	(0.318)	(0.313)	(0.331)	(0.379)	(0.267)	(0.329)
Pct Female	N/A	N/A	N/A	N/A	0.412	0.588	0.074	0.926
					(0.492)	(0.492)	(0.261)	(0.261)
Num Couples	3,040		2,395		6,118		8,545	

Standard errors are in parentheses.
Earnings and investment income are measured in $1,000.

Appendix Table A-2
Marginal Effects for Logit Results

	Same-Sex Men	Same-Sex Women	Cohabiting	Married
Race	-7.871	-16.623	-23.796	-16.474
	(0.978)	(1.185)	(0.652)	(0.523)
Age	-1.316	-0.949	-1.735	-2.041
	(0.058)	(0.061)	(0.038)	(0.030)
Schooling	-2.561	-3.751	-2.302	-2.033
	(0.203)	(0.226)	(0.135)	(0.079)
Earnings	-0.089	-0.246	-0.105	-0.022
	(0.015)	(0.029)	(0.016)	(0.005)
Investment Inc	0.045	-0.024	0.104	0.011
	(0.049)	(0.073)	(0.062)	(0.022)
Hours	-0.172	-0.138	-0.082	-0.044
	(0.030)	(0.034)	(0.016)	(0.008)
Blue Collar	-1.287	1.546	-2.103	-1.020
	(1.116)	(1.197)	(0.522)	(0.291)
White Collar	-6.301	-6.879	-6.217	-2.940
	(0.957)	(1.055)	(0.526)	(0.289)

Standard errors are in parentheses.
Marginal effects are $\delta P_j/\delta x_j = P_j(1-P_j)\beta$. Marginal effects are evaluated at the mean.
Model includes a dummy variable to control for those persons who do not report an occupation.
Service occupation is the omitted category.

Appendix Table A-3
Marginal Effects for Logit Results (with "Tradition" Variables)

	Same-Sex Men	Same-Sex Women	Cohabiting	Married
Race	-8.369	-16.970	-23.442	-15.503
	(0.972)	(1.183)	(0.649)	(0.503)
Age	-1.338	-0.999	-1.711	-1.886
	(0.057)	(0.062)	(0.038)	(0.030)
Schooling	-2.446	-3.759	-2.133	-1.829
	(0.205)	(0.236)	(0.140)	(0.078)
Earnings	-0.102	-0.236	-0.131	-0.030
	(0.015)	(0.029)	(0.016)	(0.005)
Investment Inc	0.087	0.061	0.150	0.015
	(0.049)	(0.073)	(0.062)	(0.022)
Hours	-0.151	-0.127	-0.088	-0.040
	(0.030)	(0.035)	(0.016)	(0.008)
Blue Collar	-1.277	1.391	-2.256	-0.872
	(1.107)	(1.194)	(0.524)	(0.285)
White Collar	-6.782	-6.981	-5.558	-2.799
	(0.949)	(1.051)	(0.527)	(0.281)
Age_t	-5.808	3.319	-7.702	-10.757
	(0.797)	(0.853)	(0.516)	(0.352)
$School_t$	-3.162	0.550	-0.048	-0.659
	(0.872)	(0.909)	(0.528)	(0.296)
$Earnings_t$	-2.789	0.955	-3.577	0.377
	(0.855)	(0.912)	(0.585)	(0.381)
Investment Inc_t	-7.476	-4.955	-3.202	-4.321
	(1.048)	(0.929)	(0.754)	(0.484)
$Hours_t$	-3.190	-1.397	-0.660	-0.906
	(0.867)	(0.939)	(0.648)	(0.422)

Standard errors are in parentheses.
Marginal effects are $\delta P_j/\delta x_j = P_j(1-P_j)\beta$. Marginal effects are evaluated at the mean.
Model includes a dummy variable to control for those persons who do not report an occupation.
Service occupation is the omitted category.