

## Is Human Mating Adventitious or the Result of Lawful Choice? A Twin Study of Mate Selection

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Pairs of middle-aged twins and their spouses provided data on 74 mainly psychological variables. Neither spousal similarity nor idiosyncratic criteria could account for specific mate selection in these 738 couples. Of the twins (and their spouses), 547 independently rated their initial attraction to their twin's mate (or to their spouse's twin): Findings suggest that characteristics both of the chooser and the chosen constrain mate selection only weakly. This article proposes that it is romantic infatuation that commonly determines the final choice from a broad field of potential eligibles and that this phenomenon is inherently random, in the same sense as is imprinting in **preocial** birds.

The heart has its reasons that the reason knows not of.  
—Blaise Pascal, *Pensées*, Section IV, No. 277

Mate selection: choosing whom we hope will be our life's companion, the person who will contribute half the parenting and **half the genome for** our children—our **windows of opportunity** on genetic immortality—is perhaps the most important choice we ever make. Whether mate selection is coolly rational or emotionally intuitive, we assume that salient characteristics of the chosen will be related in some sensible way to characteristics of the chooser. In this article, we report a series of four studies testing various models of mate selection. The first study tests the similarity model, the hypothesis that we select mates similar to ourselves. It is argued that the equity model, the hypothesis that we seek a partner similar in “mate value” to ourselves, can be regarded as a facet of the similarity model and shares its limitations. The poverty model, which holds that most people have few mating opportunities and must, in effect, take what they can get, leaves unexplained the widely shared perception of romantic couples that they have “found their one and only.” The second study tests the idiographic model, the hypothesis that we each act on idiosyncratic criteria that lawfully determine mate selection. Study 3 is a test of the hypothesis that monozygotic (MZ) twins, who are similar because they share a common genome and similar rearing experiences and

who therefore tend to have similar tastes and make similar choices, should be similarly attracted to the same spousal candidates. Study 4 is a test of the related hypothesis that the spouses of MZ twins, having become romantically attached to one twin, should therefore have found their spouses' **cotwin** more attractive than, say, some random friend of their spouse. The results of these studies have led us to conclude that, whereas much human choice behavior is undoubtedly lawful and, to some extent, predictable, mate selection is to a surprising extent random and unpredictable. Although this is perhaps disconcerting to psychologists, this conclusion will come as no surprise to poets, parents, and siblings. We suggest an explanation of these findings based on evolutionary considerations.

### Study 1: The Similarity Model of Mate Selection

The simplest hypothesis about mate selection is that of positive assortative mating, the conjecture that we choose mates who are like ourselves in cognitive ability, personality, interests, values, attitudes, and so on. A related model, negative assortment or complementary selection (“opposites attract”), can be tested at the same time with **the** same data. With remarkable consistency, spousal correlations have been shown to be positive although relatively small (Buss, 1984; Vandenberg, 1972). Modest positive spousal correlations have been reported for anthropometric variables ( $r_s = .10$  to  $.30$ ; Plomin, DeFries, & Roberts, 1977) and for IQ ( $r = .37$ ; Bouchard & McGue, 1981); somewhat stronger ones have been reported for physical **attractiveness** ( $r_s = .38$  to  $.52$ ; Murstein, 1972; White, 1980) and **educational attainment** ( $r = .46$ ; Plomin, DeFries, & Roberts, 1977). Spousal similarity in personality, measured by self-report or other rated, is weak, with correlations ranging from  $-.23$  to  $.47$  but averaging about  $.15$  (Buss, 1984), whereas correlations for personal values are slightly higher ( $r_s = .20$  to  $.58$ ; Caspi, Herbener, & Ozer, 1992; Jensen, 1978). Similar correlations have been reported also for the unwed biological parents of adopted

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children (Plomin, DeFries, & Roberts, 1977). It is a curious fact that by far the strongest and best replicated psychological similarity between spouses is to be found in the cluster of traits that includes religiosity (Waller, Kojetin, Bouchard, Lykken, & Tellegen, 1990), conservatism (Martin et al., 1986), and authoritarianism (Altemeyer, personal communication, March 13, 1991); spousal correlations on these correlated dimensions range from .40 to nearly .70. We have replicated and extended some of this research on assortative mating in our studies of Minnesota-born, middle-aged twins and their families.

### Method

The Minnesota Twin Registry (Lykken, Bouchard, McGue, & Tellegen, 1990) has collected biographic and inventory data from a large, birth-record-based sample of middle-aged twins born from 1936 through 1955 and from many of their spouses and parents, a sample that is demographically representative of the general population of the north central United States. For purposes unrelated to the present problem, five inventories, totaling 623 items concerned with personality, self-rated talents, occupational and recreational interests, and attitudes on 14 controversial topics, were mailed to these twins and their spouses. The return rate was 74% overall; completed inventories were returned by both members of 901 pairs of married twins, by 1,052 of their spouses, and by the spouses of both twins in 269 of these pairs. The battery was also completed by 133 pairs of the parents of the younger participant twins. The twins ranged in age from 29 to 50 years ( $M = 37.9$  years,  $SD = 7.8$ ), the spouses from 22 to 68 years ( $M = 38.0$  years,  $SD = 8.2$ ), and the parents from 45 to 85 years ( $M = 62.3$  years,  $SD = 5.4$ ).

All participants completed the 300-item Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982; Tellegen et al., 1988; Tellegen & Waller, in press), which yields 11 first-order personality dimensions and the 3 higher order or superfactors of Positive and Negative Emotionality and Constraint. The Minnesota Vocational Interests Test consists of 100 items written to tap the broader factors of occupational interest that are commonly identified. The Minnesota Leisure-Time Interest Test consists of 120 items describing a wide variety of leisure time activities such as "going fishing," "nightlife: bars, nightclubs, discos, etc.," "volunteer work," "taking a college course in some subject of interest," "going on a camera safari in Africa, Borneo, the desert, or the Amazon basin," or "getting involved in controversial issues." Most of the items are stated rather generally, for example, "risky pastimes: hang gliding, mountain climbing, surfing, etc." The Minnesota Talent Survey is a 40-item survey of familiar talents. The four alternatives are worded so that 1 represents *outstanding or professional-level talent*, 3 is labeled *average*, and 4 is below *average*. The 40 items range widely (e.g., "carpentry," "cooking," "singing," "athletics," "buying and selling," "public speaking," "physical strength," "judgment," "good host," "writing ability," and "cool headed").

The Self-Rating Inventory consisted of 31 items assessing qualities not directly addressed by the other items in the test battery. These items asked about abstract intelligence, creativity, mental energy, physical energy, morality, empathy, irritability, self-discipline, affability, nurturance, emotional control, and team spirit—attributes that also have potential relevance to marital satisfaction. The 14 attitude items were concerned with controversial topics such as welfare, gun control, defense spending, religious belief, capital punishment, protection of the environment, and the proper role of government. These inventories are described more fully in Lykken, Bouchard, McGue, and Tellegen (in press).

In addition to the 14 attitude items and the 14 scales of the MPQ, the inventory items generated 18 talent and self-rating factors (e.g., good

looks, mental ability, and probity), 19 recreational interest factors (e.g., intellectual pursuits, gambling, hunting, and religious activities), and 18 occupational interest factors (e.g., blue collar, personal service, farming or ranching, and selling or trading; see Waller, Lykken, & Tellegen, in press). The alpha reliabilities, based on 1,728 men and 2,284 women, are shown in Table 1 together with the intraclass correlations on these variables of 512 pairs of adult MZ twins, included as an indication of the degree of similarity on these traits that can be expected in pairs of very similar people. Adding height, weight, ponderal index, foot length, and years of education made up a total of 88 variables, all of which were corrected for quadratic regression on age (McGue & Bouchard, 1984), separately by sex, before correlations were computed. Although we did not choose this set of variables for the purpose of studying spousal similarity and although some dimensions such as physical attractiveness that would be of interest here were not assessed, they do constitute a broad and varied collection of measures, many of which would be of interest to prospective mates.

The wide age range of the sample made it possible to investigate whether spousal similarity increases with years married; are the observed similarities due to assimilation or are they already in place when couples decide to marry? In this sample of 1,052 twin-spouse couples and 133 parental couples, absolute within-pair differences on all 88 variables were correlated with years married, to determine, for each variable, whether spousal similarity increases with cohabitation. Husband-wife correlations within the 1,185 spousal pairs then were computed for each of these 88 variables.

### Results

The correlations between absolute within-pair differences and years married ranged from  $-.09$  to  $.12$ ; the mean correlation was  $-.006$ . The most plausible inference is that these couples were about as similar on these variables when they married as they were when assessed. This result corroborates previous reports (Buss, 1984; Caspi et al., 1992).

The 10 variables yielding the largest spousal correlations are listed in Table 2. Seven of these 10 variables comprise a higher order factor that can be labeled *Traditional Values*. People high on this factor enjoy church activities and have high scores on the MPQ's Traditionalism scale; they oppose abortion, favor a strong national defense, and are politically conservative; they do not enjoy gambling, visiting nightclubs, or flirting. This is plainly the dimension of religiosity-conservatism previously noted as being second only to age in strength of spousal resemblance. A second dimension is educational attainment. Finally, the spousal pairs correlated  $.34$  to  $.36$  in their interests in hunting, fishing, camping, canoeing, hiking, and so on. Every one of the 88 spousal correlations was positive, although 47 were less than  $.20$  and only the 10 listed in Table 2 were greater than  $.30$ .

In the lower half of Table 2, we can see that spouses are slightly correlated ( $.28$ ) in (self-reported) height, less so than opposite-sex dizygotic (DZ) twins (the value shown in the table,  $.43$ , is based on 893 twin pairs). Spousal correlations in talents, leisure, and occupational interests are low, averaging  $.10$  to  $.25$ , but they are about as strong as the DZ twin correlations. The mean correlation of spouses on the 10 MPQ personality scales ( $.08$ ) is lower than the mean for DZ twins ( $.18$ ).

### Discussion of Study 1

With a new set of variables and a large and demographically representative sample of middle-aged married couples, we con-

Table 1  
*Means and Ranges of the Alpha Reliabilities and the Intraclass Correlations Within Pairs of Monozygotic Twins on the Inventory Variables Used in This Study*

Variable	No. of items	$\alpha$ ( $N = 4,012$ )		Monozygotic $r$ ( $n = 512$ pairs)	
		$M$	Range	$M$	Range
MPQ Personality scales	14	.84	.78-.89	.49	.36-.63
Attitude items	14	— <sup>a</sup>		.30	.14-.52
Leisure-Time Interest scales	19	.69	.55-.88	.50	.30-.65
Vocational Interest scales	18	.70	.53-.82	.46	.26-.58
Talents and Attributes	18	.55	.25-.93	.44	.31-.70

Note. All variables were corrected for quadratic regression on age, separately by sex, before correlations were computed. MPQ = Multidimensional Personality Questionnaire scale.

<sup>a</sup> Alpha is not defined for single items.

firm previous reports, cited earlier, that spousal pairs tend to resemble each other weakly to moderately on, in this case, **88** **88** mainly psychological variables. These **88** variables are not mutually orthogonal, however; the recreational and vocational interest scales correlate with one another and with the personality, talent, and self-appraisal factors, the attitude items, and with years of education. As others have reported, the strongest spousal similarities are in the related dimensions of traditionalism and religiosity, followed by educational attainment and stature. The question that remains to be addressed is this: Does this positive **homogamy**, or **similarity**, model satisfactorily account for specific mate selection?

Consider an unmarried, 30-year old man hoping to select a mate from among all the eligible women of his acquaintance between the ages of (say) **20** and **35**. If he has special ethnic or

religious requirements—if he would consider only Norwegian Lutherans, for example—then he will have further narrowed what Kerckhoff (1974) would call his “field of eligibles.” Assume we know that the spousal correlations for physical attractiveness and traditional values are both about **.50** and that these variables are orthogonal and normally distributed; how will this information help our seeker focus his search? Suppose his own scores on both attractiveness and traditionalism are exactly at the mean (which we will set at  $50 \pm 10$ ). We know that the standard deviation of his potential mates on both variables will be  $10(1-r^2)^{1/2} = 8.7$ . If all seekers take care to select mates who differ from themselves in traditionalism by not more than 2.5 ( $8.7 = 21.75$  T-score units), then the spousal correlation for traditionalism will remain at about **.50** and we know that about 99% of all potential mates for our seeker will

Table 2  
*The 10 (of 88) Variables That Yielded the Highest Spousal Correlations, Plus the Mean Correlations for Personality, Interest, and Talent Factors*

Variable	Spousal $r_s$	Twin correlations	
		MZ	DZ
LTI: church activities	.57	.59	.33
Years of education	.56	.74	.55
ATT: abortion	.49	.53	.35
MPQ: traditionalism	.48	.62	.34
LTI: nightlife, flirting	.37	.43	.21
LTI: gambling	.36	.51	.37
LTI: hunting and fishing	.36	.55	.30
LTI: camping, hiking	.34	.54	.25
ATT: conservative vs. liberal	.33	.39	.28
ATT: defense spending	.33	.35	.09
Height	.28	.91	.43
$M$ of 10 MPQ scales <sup>a</sup>	.08	.45	.18
$M$ self-rated talents	.10	.44	.17
$M$ interests	.21	.47	.21
$n$ of pairs	1,185	512	389

Note. Within-pair correlations for monozygotic (MZ) and dizygotic (DZ) twins are provided for comparison. LTI = leisure time interest factor; ATT = attitude item; MPQ = Multidimensional Personality Questionnaire scale.

<sup>a</sup> Well-Being, Social Potency, Achievement, Social Closeness, Stress Reaction, Alienation, Aggression, Control, Harm Avoidance, and Absorption.

have traditionalism scores in this range, from 28.25 to 71.75. But some 97% of all eligible women score in this range on traditionalism, so this one-dimensional criterion does not help much to narrow the search.

Our seeker knows also that his potential wife should have an attractiveness score in the same range. But about  $.97^2 = 94\%$  of all women have both scores in this range and are thus potential mates for him. If we knew of 10 mutually uncorrelated variables on which spouses resembled each other to the extent of  $r = .50$ , then we could target his search on just the  $.97^{10} = 74\%$  of all women (or of all Norwegian Lutheran women) who fall within the 10-dimensional hypercube in which he can expect to find his future bride. But 10 such orthogonal homogamy variables have not been identified, and there probably are not more than the equivalent of 4 or 5, even taking into account the host of correlated characteristics on which spouses are weakly similar. It is doubtful that even the most complete database of assortative mating coefficients could serve to focus our seeker's search on fewer than about  $.97^5 = 86\%$  of all women in his field of eligibles. Even if our seeker himself had scores of 70 on all 5 variables, so that his search area was in a less populated region, he would still be left to choose among some 52% of all eligible women.

In quantifying the extent to which spousal correlations narrow the field of eligibles, it is seductive but erroneous to interpret these correlations as predictive of some criterion, as in multiple regression. Merely four mutually orthogonal predictors that each correlate  $.50$  with the criterion would account for 100% of criterion variance, whereas five orthogonal predictors that each correlate  $.90$  with the same criterion is mathematically impossible. Yet, by way of comparison, it is easy to find five mutually orthogonal variables on which MZ twins show an average within-pair correlation of  $.90$  (e.g., age, height, fingerprint ridge count, IQ, and electroencephalogram alpha frequency). By the same analysis used above, an MZ twin seeking his or her **cotwin** on the basis of just these five variables will narrow the search area to less than 1% so that, from a group of 100 candidate **cotwins**, a specific and singular pairing is likely to occur. For our lonely bachelor, however, in his neighborhood, at the singles bar, at the church social, at school, or at work, the entire literature on spousal similarity would eliminate not more than **half the** young women whom he encounters and will therefore leave him still unmated.

**Just deserts, or equity, model.** Another model of mate selection, promulgated by Goffman (1952) and Blau (1968), suggests that each of us assesses our own **mate value** and then seeks in a search area populated by prospective mates to whom we attribute mate values similar to that which we attribute to ourselves. In other words, this model suggests that we seek our "just deserts," scorning potential mates whose value we assess much lower than our own and not aspiring to mates with mate values much higher than we could offer in return. This model has considerable plausibility, so much indeed that one feels it must be true, at least at the extremes; the ordinary person who becomes fixated on a movie star is considered to be odd. Beginning with Walster, Aronson, Abrahams, and Rottman (1966), a series of studies, reviewed by Berscheid and Walster (1978, pp. 182–191), led these authors to conclude that "People do seem to

end up choosing partners of approximately their own 'social worth:' " (p. 190).

The work of Buss (1984, 1989) and others demonstrates two important facts relating to the equity model of mate selection: With remarkable consistency across diverse cultures, (a) people express similar preferences and, within sex, similar rank ordering of preference in their descriptions of an ideal mate; and (b) men rank women highest who are young and beautiful, whereas women pay more attention to status and earning power in evaluating men. Thus, there appears to be cross-cultural generality combined with consistent sex-specific differences in the formulae that people use in computing mate value.

On the other hand, the mate-value assessments that influence mate selection must be the subjective assessments of the two individuals involved, and these may not correspond to the assessments that others would make. Feingold (1992), in a recent meta-analysis, found that self- and other-ratings of physical attractiveness share less than 5% of common variance. Murstein (1976) asked 98 young married couples to rate, on a 5-point scale, the physical attractiveness of their spouse and of themselves; eight judges also rated, on the same scale, the attractiveness of each spouse from photographs. The judges rated 21% to 24% of the spouses as above average in attractiveness, whereas 67% of the wives and 85% of the husbands rated their spouses above average (39% and 43%, respectively, rated themselves above average, pp. 149–150). Because physical attractiveness is an important component of mate value, especially for men (see above), these data suggest the possibility that mate value may be to some extent a consequence, rather than a predictor, of mate selection, that the causal sequence is "I want her; she's beautiful" rather than "She's beautiful; I want her."

As a theory of mate selection, we suggest that the just deserts model can be regarded as a facet of the similarity model; just as we tend to confine our search area to people similar to ourselves in IQ, physical attractiveness, traditionalism, and the like, so too do we tend to acquire mates not too different from ourselves in mate value, as we make that subjective assessment. It is probable that our ratings of mate value will be correlated with, and predictable from, our estimates of the candidates' scores (or of their similarity to ourselves) on these same dimensions. Even if we assume that our assessment of a candidate's mate value is wholly independent of our assessment of physical attractiveness, traditional values, IQ, and the like, there is no reason for supposing that the spousal correlation for mate value, as it was assessed by both partners before their selection of each other, is any higher than, say, the spousal correlation for good looks, that is to say, about  $.50$ . Therefore, it seems unlikely that incorporating the just deserts model into the similarity model would substantially narrow the search area, and our hypothetical seeker would still be left to choose among at least half of all the potential mates who meet his eligibility requirements. In other words, it appears that the models in question are capable, at best, of identifying (some of) those whom he will not select but are not capable of determining—or even strongly focusing—his affirmative choice. Both models succeed in directing him into the appropriate line at the **mating cafeteria**, the line that features the dishes he can afford. that he is accustomed to, and finds appropriate (let us call it the kosher line),

but they do not explain why he chooses one dish rather than another when the time comes.

**Choices.** Buying a house, a car, or a suit involves something analogous to the just deserts idea in that we know what we can afford to pay and we confine our search to items in that price range. What we do then is to rank order the possibilities according to subjective criteria and then select the top ranked item. The similarity model might be taken to imply that, in selecting a mate, we rank order available candidates within our search area according to their similarity to ourselves and thus accomplish a specific selection. Yet, there seems to be no evidence at all that we do this and, moreover, if we did, the spousal correlations would be higher than in fact they are. That is, if we restrict the field of eligibles to people whose absolute difference from ourselves in, say, physical attractiveness is 0.8 standard deviations, then the resulting spousal correlation in physical attractiveness will be about .50. But, if we proceed to choose among available eligibles that person closest to ourselves in physical attraction, then the spousal correlation would be substantially higher than .50. Therefore, this crucial second step of selecting by a paired comparison process the best of our short list of eligibles, the step that characterizes most choice behavior and makes singular selection possible, does not seem to occur in the selection of mates, not at least if we are selecting on the basis of the same standard set of nomothetic dimensions. The similarity data indicate that we exclude candidates too different from ourselves, but we know of no evidence that, given several candidates, we tend reliably to select that individual among them who is closest to us in the several-dimensional similarity space. Especially because such selection would yield correlations higher than those observed, then absent such evidence, it appears that the similarity model (and the just deserts model) must be rejected as a theory of specific mate selection.

**Poverty or last chance model.** It could be argued that the discussion so far, which seems to imply that mate selection is like choosing clothes off a rack or a meal in a cafeteria, is unrealistic; most of us do not have that many choices. As Kerckhoff (1974) pointed out, many of us only know people in our neighborhood, school, church, or workplace, and most of those people resemble us enough, because of the ethnic and social stratification that these institutions naturally impose, to fit within our similarity hypercubes. By thus limiting our field of availables, propinquity alone might be responsible for the spousal similarity that we observe. Perhaps most of us do not do any selecting at all but, instead, accept the first serious prospect that comes along during the period(s) in our lives when we are interested in getting married. This poverty or "bird-in-the-hand" model suggests that mating is like the pairing off of couples at a dance or at a singles bar; he asks because she's there and looks to be available and she accepts because he is the only one who's asked her.

Unlike the similarity and the just deserts models, the poverty model does not leave the seeker in the kosher line, unable to decide, because this model tells us that there will be only one entree available. It can hardly be doubted that something like the poverty model reasonably describes at least some marriages today, nor is there compelling reason to doubt that many such marriages work out very well. Most marriages, in many parts of the world, are arranged alliances in which the participants have

little or no power of choice and, therefore, are similar to the single-option situation of the poverty model, and we must presume that most such arranged marriages successfully accomplish the primary purpose of marriage: the bearing and rearing of children.

Indeed, it seems likely that the poverty model reasonably describes the situation that prevailed during the Pleistocene era, when our ancestors lived in small bands and between-band contact was limited and precarious. It may well be that circumstances permitting a real range of mate choice are so recent in human history that an adaptive mechanism for mate selection has not been well shaped by evolutionary pressures. We shall argue, however, that our species has evolved a mechanism for pair bonding and that it is this mechanism which, for many in modern Western societies, creates an illusion of mate choice.

But let us meanwhile accept the common belief that most of us in modern Western societies "marry for love," that we do have options and we do make choices, and see where it leads us. As we have shown, the similarity model (which we shall hereafter assume to include the just deserts model as a component part), is accurate descriptively; spousal pairs do tend to resemble each other in age, traditionalism, physical attractiveness, education, stature and, weakly, in most other respects. This is presumably because most of us tend to acquire mates from among candidates, most of whom resemble us in these ways, either because we restrict our search to this group or because this is the only group available to us because of the effects of social stratification. But the similarity model has not been shown to be able to account for our actual choice among that (in principle, large) group of candidates.

## Study 2: The Idiographic Model of Mate Selection

Searching for evidence of spousal similarity-positive assortative mating is methodologically easy, a matter of assessing married couples on a variety of traits and then computing spousal correlations. But this approach is reminiscent of the inebriate who has lost his car keys in a darkened doorway but elects to look for them under the street light. It would be hard to find, in romantic poetry or in real life, a description of a beloved that is couched in terms of similarity to the self-description of the lover. The obverse hypothesis, negative assortative mating or the attraction of opposites, is an ancient idea reflected in the belief that one seeks in a mate the other half of the perfect being of whom the first half is one's self. But this complementary model of mate selection is invalidated by the same weak but consistently positive spousal correlations already mentioned.

A more likely hypothesis is that each individual has a unique set of criteria, so that we are not all competing for the same few "perfect" mates, and that any random John or Marsha will use idiosyncratic criteria that may include some similarities, some differences, and even some opposites. Winch's (1958) theory of complementary needs and Murstein's (1976) stimulus-value-role theory of marital choice are variants of this idiographic model of mate selection.

### *Similarity of the Mates of Monozygotic Twins*

The idiographic model of mate selection asserts that each individual possesses certain reasonably discriminating criteria

that guide mate selection. These criteria differ from person to person, thus allowing most individuals to find someone whose criteria they satisfy. The criteria may not be entirely conscious or easily articulated, but they are effective; the hypothesis insists that mating is regulated by lawful principles involving conscious or unconscious choice. Each individual's criteria are determined by his or her own unique demographic, physical, and especially, psychological characteristics. Recent research has demonstrated that virtually every physical, demographic, and psychological characteristic is to an important extent influenced by genetic factors (Bouchard, Lykken, **McGue, Segal, & Tellegen**, 1990). MZ twins share a common genome and are genetically identical. Moreover, MZ twins reared together have also shared most of their developmental history. It is becoming increasingly apparent that merely being reared together does not ensure that the effective environment of two siblings is the same; genetically different individuals in the same household elicit and effect different environments or react differently to the same experiences (Plomin, Defries, & Loehlin, 1977; **Scarr & McCartney**, 1983). But these gene-environment correlations and interactions, which can yield marked differences between siblings, merely increase the similarity of MZ twins.

Therefore, it is plausible to suppose that the **mating** criteria of **MZ cotwins**, if such criteria exist, as the idiographic model requires, ought to be quite similar. If these criteria exist, they must be somehow determined by a combination of genetic and environmental factors, including gene-environment correlations and interactions, and because these presumed causal factors are all shared by MZ twins, their products—including the elusive, idiosyncratic mating criteria that we seek—should be very similar in **MZ cotwins**.

This line of reasoning suggests that a strong test of the idiographic model would be to compare on an adequate variety of traits the spouses selected by pairs of monozygotic twins. For each twin individual, we cannot predict what his or her mating criteria may be nor can we confidently rely on his or her ability to tell us. We can be confident, however, that they should be similar (if such idiosyncratic criteria exist) to the criteria that guided the selection of the **cotwin's** mate. We cannot presume that any individual's criteria are comprehensive, prespecifying every spousal trait that we might think to measure. That is, the idiographic model does not predict that the spouses of MZ twins will be similar in all respects. However, if the idiographic model has any meaning at all, it must require that, for each pair of married MZ twins, there should be some set of features of the spouses that were criterial for these twins, sufficiently selective to determine a specific choice, and with respect to which, therefore, this pair of spouses should be very similar.

To help clarify the idiographic model, it may be useful to imagine how it might be applied to the study of twins' choices of cars rather than mates. Different individuals probably rank order the attributes of automobiles idiosyncratically, but **MZ cotwins** are likely to consider the same set of attributes—cost, power, color, size, handling, and so on—as most important (i.e., as **criterial**). Although we would not expect such twins to always select identical **vehicles**, we would expect their choices to be very similar in at least certain respects.

The idiographic model predicts that each pair, *i*, of MZ spouses should be markedly similar with respect to at least

some small subset,  $K_i$ , of the *N* personality and interest traits measured, where the several traits included in  $K_i$  vary unsystematically from pair to pair. If we transform all variables to have the same mean and standard deviation, sort for each pair the *N* absolute between-spouse differences in order of size, and then average over spousal pairs, the idiographic model predicts that there will be more very small differences for MZ than for DZ spouses and more small differences (i.e., more of the *N* variables for which the within-pair difference is, say, 0.5 standard deviations or less) for DZ spousal pairs than for the spouses of randomly paired persons of the same sex.

### Method

The same data set described above provided scores on the 88 **variables of the spouses of 152 pairs of MZ twins and 117 pairs of DZ twins**. The twins ranged in age from 29 to 55 years; their spouses ranged in age from 24 to 67 years. The mean ages were 41.0 years and 36.9 years for husbands and wives, respectively. All scores except the attitude item responses were age corrected separately by sex and converted to T score units with  $M = 50$  and  $SD = 10$ . (The 14 individual attitude items could not be meaningfully converted to T scores and were not included in this analysis, leaving a total of 74 variables.) The spouses of the MZ and the DZ twin pairs were separately correlated on all variables, with the results shown in Table 3; all values of .30 or higher are listed in the table.

To test the idiographic model as described above, the absolute T score **differences** on all 74 variables between Spouses A and B were rank ordered by size and then averaged over the spousal pairs of MZ and DZ twins separately, to produce Figure 1. Because this method of analysis is novel, for comparison purposes it was applied also to the MZ twin pairs themselves (the twins married to the MZ **spouse-spouse** pairs) and to a sample of unrelated or "random" pairs, formed by randomly reassigning (within sex) the MZ spouse-spouse pairs.

### Results

The top curve in Figure 1 shows that, on average, the MZ twin pairs had identical scores on 5 of the 74 variables (perhaps a different set of 5 variables for each pair), differed by one T score unit on 3 variables, and so on. The mean difference for the MZ twins was 7.39 T score units; the average correlation implied by this mean difference (*D*) is (see Plomin & DeFries, 1980)  $r = 1 - (D/1.13\sigma)^2 = 1 - ([7.39]/11.3)^2 = .57$ , where *D* is the mean absolute intrapair difference and  $\sigma$  is standard deviation. The mean difference for the unrelated pairs was 10.92 T score units, corresponding to an average correlation of .06. The mean differences for the MZ and DZ spouse-spouse pairs corresponded to average correlations of .14 and .11, respectively.

As can be seen in Table 3, which includes the same variables listed in Table 2 (and all correlations greater than .29), the spouses of twins resemble each other even less than they resemble their twin spouses, and what similarity exists consists almost entirely in the same religiosity-conservatism and education-cultural variables on which twins resembled their spouses. As can be seen in Figure 1, both groups of spouse-spouse pairs produced mean absolute differences that very nearly coincide with those of the unrelated pairs and, most importantly, the numbers of very small spouse-spouse differences are identical for the spouses of MZ and DZ twins. That is, most pairs even of

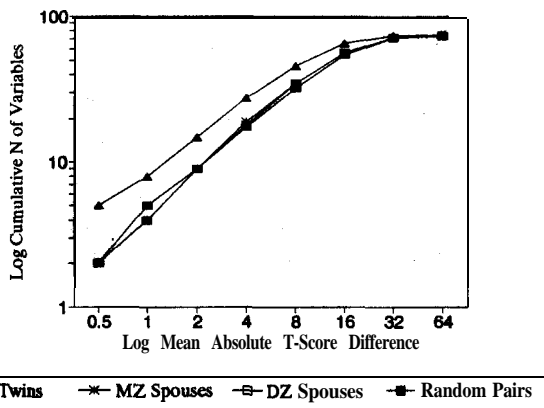
Table 3  
**Similarity of the Spouses of Pairs of Monozygotic (MZ) and Dizygotic (DZ) Minnesota Twin Registry Participants on 10 Attributes**

Variable	Twin vs. spouse <i>r</i> s	spouse vs. spouse <i>r</i> s	
		MZ	DZ
LTI: church activities	.55	.30	.33
Years of education	.52	.42	.40
ATT: abortion	.48	.29	.37
LTI: gambling	.42	.25	.10
MPQ: traditionalism	.42	.23	.17
LTI: nightlife, flirting	.38	.20	.07
LTI: camping, hiking	.37	.19	.04
ATT: conservative vs. liberal	.33	.14	.17
ATT: defense spending	.32	.23	.22
LTI: hunting and fishing	.29	.20	.17
Height	.28	.15	-.12
<i>M</i> of 10 MPQ scales <sup>a</sup>	.13	.00	.01
<i>M</i> self-rated talents	.10	.06	.01
<i>M</i> interests	.16	.14	.07
<i>n</i> of pairs	538	152	117

**Note.** The twin-spouse correlations for these 538 spousal pairs are included for comparison. LTI = leisure time interest factor; ATT = attitude items; MPQ = Multidimensional Personality Questionnaire scale.

<sup>a</sup> Well-Being, Social Potency, Achievement, Social Closeness, Stress Reaction, Alienation, Aggression, Control, Harm Avoidance, and Absorption.

unrelated individuals will show similar scores on some of this diverse set of 74 psychological factor scores just by chance; on the average, each random pair will differ by less than five T score units on about 10 of the 74 dimensions. Pairs of individuals who were selected as spouses of MZ twin pairs show no



**Figure 1.** Log-log plots of the number of variables (totaling 74) that show the mean absolute differences in T score units ( $M = 50$ ,  $SD = 10$ ) shown on the X axis. (Data are given for pairs of monozygotic (MZ) twins, for random pairs of unrelated persons, and for pairs of spouses of MZ or dizygotic (DZ) twin pairs. For each pair, the 74 absolute differences were rank ordered before being averaged over pairs of the given type. The figure shows that, although pairs of MZ twins produce very similar scores on many variables, differing by less than 0.5 standard deviations on nearly half of them, the spouses of MZ twins show no more small within-pair differences than the spouses of DZ twins or than random same-sex pairs.)

more similar scores than do DZ spouse-spouse pairs and hardly more than do random pairs of same-sex adults.

The idiographic model of mate selection predicts (a) that each individual chooses a mate according to some idiosyncratic small set of criteria, (b) that MZ twins are likely to use similar criteria, and therefore, (c) that MZ spouse-spouse pairs, while not remarkably similar in all or most respects, will tend to be very similar in at least a few respects. We have tested this final prediction with respect to a wide range of potential psychological criteria and with negative results.

### Study 3: Twins' Evaluation of Their Cotwins' Choices

Yet another test of whether mate selection is lawful versus adventitious would be to simply ask adult twins to evaluate the choices, including mate selections, made by their cotwins. If choice behavior is lawfully influenced by characteristics of the chooser, then twins should tend to approve of their cotwin's choices or should indicate that they are similar to the choices they themselves have made or would make. Moreover, MZ twins should endorse their cotwin's choices more frequently than do DZ twins on the average. If we also ask the twins to report how they felt about the cotwin's choice of a mate (at or about the time of the cotwin's marriage when we can be reasonably sure that the cotwin was under the impression that the right choice had been made), then the data will permit us to estimate whether mate selection is about as lawfully dependent on the characteristics of the chooser as are the other types of choices sampled. We cannot expect even MZ twins to feel about their cotwin's fiances and fiancées as positively as their cotwins do; even MZ twins are not identical psychologically, and each twin is likely to know his or her spouse-to-be better than the

**cotwin** does. Nevertheless, if mate selection is a lawful process, then we should expect MZ twins to approve of **each** other's new spouses at least as strongly as they approve, for example, of each other's choice of wardrobe or of vacation activities.

**Method**

A one-page Choices questionnaire was sent to both members of 400 pairs of twin participants in the Minnesota Twin Registry. All recruited pairs had been married, ranged in age from 35 to 55 years, and had previously provided demographic (including zygosity) data and returned one or more personality and interest inventories. The Choices questionnaire was sent to 100 pairs each of male and female MZ and same-sex DZ twins. The questionnaire included five items. The first two asked each twin to compare his or her own with the **cotwin's** choices of clothing and of household furnishings and decoration. The alternatives for the clothing item were "Our choice in clothes is" (a) *almost identical*, (b) *quite similar*, (c) *as similar as two friends*, (d) *not very similar*, (e) *very different, contrasting*, or (f) *I can't answer this question*. Alternatives for the household item were similar. Items 3 and 4 asked the twin to indicate how he or she would feel about taking the kind of vacations that the **cotwin** took or about having the kind of job the **cotwin** had. The alternatives provided were (a) *would hate it*, (b) *ho-hum*, (c) *okay*, (d) *would like it*, (e) *would love it*, and (f) *can't answer*.

The final, mate-selection item was identified as the "most important choice that most of us ever make," and the strict confidentiality of our individual records was once again emphasized. The respondent twin was asked to think back to when the **cotwin** first decided to marry and to describe his or her feeling at that time about the twin's choice of mate. The alternatives were (a) *I felt that I'd rather stay single than marry my twin's fiancée*, (b) *I would not have chosen my twin's fiancée*; (c) *I had no strong feeling one way or the other*, (d) *I really liked my twin's fiancée*, (e) *I could have fallen for my twin's fiancée*, and (f) *I just can't answer this question*.

**Results**

Without inducements or prompting, completed questionnaires were returned by 120 MZ men, 109 DZ men, 168 MZ women, and 150 DZ women. The *can't say* alternative was selected by less than 5% of each group on all but the vacation questions. Some 27% of these adult DZ twins and 18% of the MZ twins knew too little about their **cotwin's** vacation activities to answer that question. The data shown in Table 4 were produced by summing the two positive alternatives (*similar or like-love*) and the two negative ones (*dissimilar or dislike-hate*) and expressing each as a percentage of the total number of responses minus the *can't say*.

The data show that, for both sexes, twins consider their **cotwin's** choices of wardrobe and of household furnishings to be similar to their own, and this is more true for MZ than for DZ twins. They also feel positively disposed toward their **cotwin's** choice of vacations and of jobs and, once again, this similarity in choice behavior is greater for MZ than for DZ twins. On the crucial question of mate selection, however, a very different picture emerges. About as many twins of both sexes and both twin types disliked as liked their **cotwin's** choice of fiancée or fiancé (i.e., the number who reported more negative feelings than the neutral alternative, *I had no strong feeling one way or the other*, about equaled the number reporting more positive feelings). The MZ twins did not approve of their **cotwin's** choice

Table 4  
*Percentages of Adult Twins' Attitudes Toward Their Cotwin's Choices of Clothes, Household Furnishings, Vacation Activities, Job, and Mate (at Time Cotwin Got Married)*

Variable	Men		Women		Total	
	MZ	DZ	MZ	DZ	MZ	DZ
Wardrobe						
Similar <sup>a</sup>	70	> 34	80	> 44	76	> 40
Dissimilar	7	< 31	10	< 32	8	< 32
Household furnishings						
Similar	56	> 33	70	> 47	64	> 41
Dissimilar	17	< 35	15	< 29	16	< 31
Vacation activities						
Liked <sup>b</sup>	70	> 56	81	> 65	80	> 61
Disliked	7	10	5	10	6	10
Job						
Liked	64	> 42	54	> 43	59	> 42
Disliked	10	< 28	20	27	16	< 27
Mate						
Liked <sup>c</sup>	40	35	39	40	39	37
Disliked	34	41	41	44	38	40
nofpairs	120	109	168	150	288	259

Note. |= Percentages rating "similar" vs. "dissimilar" or "liked" vs. "disliked" differ at  $p < .05$  by chi-square test. > or < = monozygotic (MZ) and dizygotic (DZ) percentages differ at  $p < .05$ .

<sup>a</sup> Scale was *almost identical-quite similar-average-not similar-very different-can't answer*: "Similar" = percentage of respondents choosing the first two alternatives; "dissimilar" = percentage choosing *not similar* or *very different*. <sup>b</sup> Scale was *would love it-like it-okay-ho-hum-hate it*. "Liked" = percentage choosing love if or like it; "Disliked" = percentage choosing *ho-hum* or *hate it*. <sup>c</sup> Scale was *could have fallen for my twin's spouse-really liked my twin's spouse-no strong feeling-would not have chosen by twin's spouse-would rather have stayed single-can't answer*. "Liked" = percentage of respondents choosing *could have fallen for my twin's spouse* or *really liked my twin's spouse*; "Disliked" = percentage choosing *would not have chosen my twin's spouse* or *would rather have stayed single*.

significantly more than did the DZ twins. The only perceptible trend in the mate-selection data is a tendency for male MZ twins to be more positive than negative and more positive than the male DZ twins. Although not statistically reliable, this tendency is echoed in the data to be reported next, from a similar Choices questionnaire completed by the spouses of these same twins.

Study 4: Evaluations by the Spouses of These Twins

Twins, and especially MZ twins, might be disposed to exaggerate the degree of their similarity. One way to check on this possibility would be to solicit independent ratings by a third person, acquainted with both twins, evaluating the similarity of their choice behavior. The twins' spouses can provide such independent judgments. Moreover, the spouse of **each** twin presumably played an equal role in the mate-selection process and can describe for us her or his reactions to their spouse's **cotwin** at the



time when the respondent first concluded that the spouse would be her or his choice. If mate selection is a lawful process, then the same individual who has recently selected one of a pair of MZ twins ought to feel at that time a substantial attraction to the MZ **cotwin**. If mate selection depends on some set of rather general demographic, physical, and psychological characteristics of the chosen (as well as on the characteristics of the chooser which, in this case, are held constant), then the fiancée or fiancé of one DZ twin, similarly, ought to feel a weaker but significant bias in favor of the DZ **cotwin** who shares half his or her spouse-to-be's genes plus family environment, ethnicity, and socioeconomic status.

*Method*

A slightly different questionnaire was sent in the same mailing with the Choices questionnaire to each twin's spouse. This also included five questions with five answer alternatives. The first three questions asked each spouse to compare the twins' choices in clothing, household furnishings, and vacations, just as in the twins' own questionnaire. The spouses also were asked to evaluate the twins' similarity in their choices of friends. Finally, each spouse was asked to report his or her feelings about their spouse's **cotwin** when they first got acquainted. Once again, confidentiality was emphasized and the spouses were

asked not to show their answers to their twin spouse but to seal them in a provided envelope and return them to us. The data were analyzed as for the previous questionnaire and are presented in Table 5.

*Results*

The data in Table 5 generally confirm the proposition that MZ twins tend to be similar in most of their choice behavior, not only by their own report but also as reported by a spouse. There are some differences. Male twins, according to their wives, are not as similar in their choices of household furnishings as female twins are reported to be by their husbands. It seems reasonable to infer that wives tend to have more say in household furnishing than husbands do. Conversely, male twins are more similar than female twins in their choice of vacations, at least as reported by their respective spouses. We infer that, in this population, the men tend to have more say than the women do in selecting vacation activities. The spouses of both sexes consider that the MZ twins tend to have a preponderance of similar friends, and fewer spouses of MZ than of DZ twins rate the twins' friends as dissimilar.

On the question about mate selection, we find two striking differences from the results in Table 4. The first, that nearly

Table 5  
*Percentages of Evaluations by the Spouses of Adult Twins of the Similarity in the Twins' Choice of Clothes, Household Furnishings, Vacation Activities, and Friends and the Spouses' Attitudes Toward Their Spouse's Cotwin*

Variable	Husbands of		Wives of		Total				
	MZ	DZ	MZ	DZ	MZ	DZ			
Wardrobes									
<b>Similar<sup>a</sup></b>	62	>	37	65	>	42	63	>	39
Dissimilar	28	<	43	17	<	36	23	<	40
Household furnishings									
<b>Similar</b>	39	>	23	36	>	19	36	>	21
Dissimilar	21	<	<b>39</b>	30		<b>33</b>	<b>28</b>	<	<b>37</b>
Vacation activities									
<b>Similar</b>	41		31	54	>	26	47	>	29
Dissimilar	33	<	<b>48</b>	27	<	50	30	<	49
Friends									
<b>Similar</b>	43		38	46	>	21	44	>	30
Dissimilar	<b>30</b>	<	44	<b>28</b>	<	<b>48</b>	26	<	44
Attitude toward spouse's <b>cotwin</b> when first met									
<b>Liked<sup>b</sup></b>	42	>	31	36	>	31	39	>	25
Disliked	21	<	<b>38</b>	36	<	<b>52</b>	30	<	<b>44</b>
<i>n</i> of spouses	131		121	102		99	233		220

Note. | = Percentages rating "similar" vs. "dissimilar" or "liked" vs. "disliked" differ at  $p < .05$  by chi-square test. > or < = monozygotic (MZ) and dizygotic (DZ) percentages differ at  $p < .05$ .

<sup>a</sup> Scale was almost identical-quite similar-average-not similar-very different-can't answer. "Similar" = percentage of respondents choosing the first two alternatives; "dissimilar" = percentage choosing not similar or very different. <sup>b</sup> Scale was could have fallen for my twin-in-law-really liked my twin-in-law-no strong feeling-would not have chosen my twin-in-law-would rather have stayed single-can't answer. "Liked" = percentage of respondents choosing could have fallen for my twin-in-law or really liked my twin-in-law; "Disliked" = percentage choosing would not have chosen my twin-in-law or would rather have stayed single.

twice as many husbands of MZ twins looked approvingly, rather than disapprovingly, on their fiancée's **cotwin**, may reflect the well-established finding that, in many different cultures, men attach relatively more importance than women do to physical appearance (Buss, 1989). These husbands presumably found their fiancées to be physically attractive; their fiancée's MZ **cotwins** would have tended to have a very similar physical appearance and therefore would have tended to be seen as similarly attractive. Even for the husbands, however, one fourth of them actually disliked the MZ **cotwin** of the individual they had recently selected as their mate, and only 13% endorsed *could have fallen for her myself*. Among wives of male MZ twins, in contrast, an equal proportion say they disliked as liked their prospective twin brother-in-law.

The second marked difference in Table 5 is that significantly more of the spouses of DZ twins, of both sexes, reported that they disliked than liked their spouse-to-be's twin. Among wives of DZ male twins, for example, twice as many disliked as liked their prospective twin brothers-in-law, whereas, among female DZ twins (Table 4), equal proportions liked as disliked their prospective (nontwin) brothers-in-law. We see no obvious explanation for this curious difference; why should a young woman tend to feel more antagonistic toward her husband's brother than she feels toward her sister's husband?

It is plain, however, that the results in Table 5, like those in Table 4, confirm the similarity of MZ twins in much of their important choice behavior although, at the same time, providing little evidence for the lawfulness of mate selection among singletons. When MZ twins rated their **cotwin's** selections (Table 4), 39% liked them, but 38% disliked them; only 5% said they *could have fallen for (him/her) myself*, whereas 9% insisted that they *would have rather stayed single* than marry their **cotwin's** choice. When singletons rated the charms of their spouse's MZ twin-as they perceived them at the time when they had decided to marry the **cotwin**-39% said they liked, but 30% said they disliked, their **fiancé's** or fiancée's twin; only 10% said they *could have fallen for* their spouse-to-be's identical twin (13% of the husbands and 7% of the wives), whereas 7% of both sexes *would have rather stayed single*.

### General Discussion

To summarize the argument thus far, for those of us who are free to make a choice, mate selection is often the most important choice we make. That most human choice behavior is lawful, rather than capricious, would not seem to require empirical **proof**; the fact that, by their own report and the report of their spouses, twins tend to make similar choices of friends, clothes, vacations, jobs, and so on, with MZ twins more similar than DZ twins, might therefore be regarded more as a confirmation of the twin method for studying choice behavior than as **proof of the obvious**, namely, that most choices tend to be determined by the genetic and learned characteristics of the chooser. It is therefore reasonable to use the twin method to investigate what characteristics of the chooser and chosen determine the choice of a mate.

Because spouses tend to resemble one another in most respects, and especially in age, traditionalism, physical attractiveness, education, and perhaps in "mate value" generally, it might

be supposed that similarity is the key-that one chooses as a mate that candidate who is most similar to one's self. There is no direct evidence for this conclusion, however. The observed spousal correlations would result if we did no more than avoid mating with the 50% of the population who are least similar to ourselves. Moreover, it seems probable that much of the observed pattern of spousal correlation might result from natural social stratification limiting most of our circle of acquaintances to people who fall within this 50% similarity hypercube. The similarity model, although true descriptively, does not seem to be able to account for the affirmative selection of a specific mate.

The idiographic model proposes that we each use idiosyncratic criteria, specific enough so that, when we encounter a potential mate who satisfies those criteria, that individual is singled out and recognized as right for us. This model predicts that MZ twins should have very similar criteria and, therefore, that the spouses of MZ twins should be very similar in some subset of characteristics, perhaps a different configuration of characteristics for each MZ twin pair. Because we could not assess all possible criteria attributes, we cannot claim to have refuted this prediction absolutely. In terms of the 74 varied attributes that we did assess, however, no evidence supporting the idiographic model was observed.

Two other tests similarly failed to yield support for the similarity, the idiographic, or any model of lawful mate selection. Asked to rate their attraction toward their **cotwin's** mate at the time the **cotwin** became engaged, MZ twins were not more likely than DZ twins to report that they too were attracted to their **cotwin's** choice; indeed, as many of both types of **cotwin** reported negative attitudes as reported positive attitudes toward their **cotwin's** mate selection. We could, of course, invoke ad hoc **psychodynamic** reasons to account for these results. It is possible, for example, that twins actively suppress a tendency to compete for the **cotwin's** choice, MZ twins more strongly than DZ twins, so that the expected pattern of mainly positive attraction, especially among MZ twins, is changed to correspond to the pattern we observe, namely, the pattern one would expect if unrelated pairs of individuals were asked to assess each other's mate selections. In the context of the other findings here reported, we think our interpretation is more likely: Although twins tend to make similar choices in other areas of living, choices that reflect their genetic and environmental similarity, their choices of mates are an exception. Although twins, like singletons, tend to marry persons who are rather similar to themselves, that is, they tend to select mates from among the same roughly 50% of the candidate pool, their specific choices within that pool are no more alike than the choices made by unrelated random pairs.

Finally, we find that the singleton wives of MZ twins report no special attraction toward their mates' twin brothers. Spouses of DZ twins, of both sexes, more often report negative than positive attraction toward their spouses' DZ **cotwin**. We cannot account for the reports of the spouses of DZ twins, but they clearly do not support the proposition that these spouses chose their mates for characteristics that are determined either genetically or by the rearing environment; if they had, then we would have expected their attitudes toward their twins-in-law to have been biased positively rather than the reverse. In contrast, the

husbands of female MZ twins do more often say they liked than they disliked their wives' twin sister, although only 13% admit that they *might have fallen for her myself*. We suggest that these data merely reflect the well-established tendency of men to attach more importance to physical appearance.

We cannot of course claim that these data are dispositive. Mate selection may be based on real or perceived similarities, as yet undiscovered, that are strong enough to permit the similarity or equity models to account for specific choices. The spouses of MZ twins may be very similar on variables other than those that we studied, similar enough to support the idiographic model of mate selection. Our interpretation of Studies 3 and 4 assumes the validity of our respondents' reports of how attracted they were to their **cotwins'** mate or to the **cotwin** of their own recently selected mate; this assumption may be erroneous.

If we provisionally accept our interpretation of these data, we are left with a curious and disquieting conclusion: Although most human choice behavior lawfully **reflects** the characteristics of the chooser and of the choice, the most important choice of all, that of a mate, seems to be an exception. Although we do tend to choose from among people like ourselves, another person who is remarkably like ourselves (our MZ twin) is not likely to be drawn to the same choice we make. Having made a choice, when we are then confronted with a second mate candidate who is remarkably like the person we have chosen, we are not also strongly attracted to that person. Because these conclusions are surprising, we hope others will find new ways to test them. Meanwhile, we outline a theory that is compatible with these interpretations, namely, that human pair bonding is relatively adventitious, based on romantic infatuation which, as Stendhal observed, "is like a fever that comes and goes quite independently of the will."

#### Pair Bonding

Ah! Sweet mystery of life, at last I've found you!  
Ah! I know at last the secret of it all!

-Victor Herbert

In a fascinating discussion of the evolution of love, **Mellen** (1981) attempted to account for the fact that, unlike our primate cousins (excepting the solitary gibbon) we are a pair-bonding species. These pairings are not always exclusive nor do **they** always endure for life, but pair-bonding is characteristic of our kind across cultures and since before there were cultures. Therefore, the fact that pair bonding (sometimes polygynous pair bonding) is universally supported by cultural institutions attests to its adaptational importance without denying that its primal roots are in the human genome. And that adaptational importance, of course, derived from the need for the shared efforts of a male and female parent to provide for the nutrition and protection of the uniquely altricial human infant.

The bond to which **Mellen** refers, the capacity for which evolved during the Plio-Pleistocene, motivated those ancestral fathers to stand between their families and danger and to trek home from hunting expeditions carrying heavy loads of meat instead of merely consuming their fill on the spot. And these impulses had to be sustained at least through the mate's pregnancy and the early infancy of the offspring of that bond. This

pair bonding that was adaptive during the evolution of our species and thus became a species-typical human disposition should be distinguished from what Berscheid and Walster (1978), among others, refer to as companionate love, "the affection we feel for those with whom our lives are deeply intertwined" (p. 117). In ancestral times, and often in modern times as well, companionate love developed after mating or marriage, and the literature on close relationships (e.g., Drigotas & Rusbult, 1992; Hendrick, 1989; Huston, 1974; **Ickes**, 1985; **Sternberg & Barnes**, 1988) is largely concerned with those factors that determine whether companionate love blossoms or withers. But companionate love takes time to **flower**, for mutual adjustments, for the sharing of experiences, for the forging of the ties that bind. One universal of human culture is the institution of marriage, which has the effect (and was presumably designed for this effect) of providing the time for pair bonding to mature into a more stable companionate relationship.

But it is necessary to ask What effected **this result** during the Pleistocene? What served to bind the mated pair together until the glue was set? It seems appropriate to invoke the concept of infatuation or romantic love (e.g., Walster & Walster, 1978). The time course of romantic love is opposite to that of **companionate** affection, the first peaking early and then tending to subside while the second more gradually matures. Young lovers generally feel an intense and exclusive commitment to one particular beloved, often after only months or even weeks of acquaintance. Berscheid and Campbell (1981) described the state of the young lover as one "of heightened and intensified positive emotional experiences perhaps unmatched by any other period in most people's lives" (p. 227).

Some empirical support for this characterization of the early stages of romantic love can be found in the responses of hundreds of young lovers to whom Hendrick and Hendrick (1986) administered a **42-item** Love Attitudes Scale. Among the items most strongly endorsed by these subjects were "My lover and I have the right physical 'chemistry' between us"; "I feel that my lover and I were meant for each other"; and "My lover fits my ideal standards of physical beauty/handsomeness" (their Table 1, p. 395). Among the students studied by Hazan and Shaver (1987), some 85% rejected the statement, "The kind of head-over-heels romantic love depicted in novels and movies doesn't exist in real life" (their Table 7, p. 518). Tennov (1979), who coined the term *limerence* specifically to distinguish romantic delirium from the more sober and stable companionate love that limerence ideally will presage, provided many case histories illustrating the phenomenon. Tennov also provided examples of *nonlimerent* people, both from her researches and from the literature (e.g., Richard Wagner and Lord Byron): people experienced in sexual relationships who yet had never been "in love."

If the capacity for companionate love evolved in our species to enhance the viability of vulnerable hominid young, it seems reasonable to conclude that the related capacity for romantic infatuation, which may be specific to our species, evolved concurrently because it enabled pair bonding. Within broad limits, it would not have mattered who paired with whom; as long as the female was young and healthy and the male strong and an attentive provider, the evolutionarily important goal—the

bearing and rearing of offspring-would have been achieved. Ancestral pairings need not have been any more selective or **predictable** from the individual characteristics of the male and female involved than modern matings appear to be. But the infatuation-induced ancestral pairings would have had to be specific and singular, bonding a specific male to a specific female long enough for a more permanent relationship to develop.

Imprinting evolved among precocial birds because it tied the newly hatched but mobile ducklings by invisible bonds to their mother who could thus lead them to food and to safety (Lorenz, 1952). Romantic infatuation, we suggest, like imprinting, forms an initial bond almost adventitiously and then sustains it long enough, in most instances, for an enduring bond to be forged by the slower processes of learning and adaptation that result in companionate love. Money and Ehrhardt (1972) speak of imprinting in this same context. Fisher (1992), in her study of 58 contemporary societies, finds a remarkably consistent tendency for the first divorce, if divorce occurs at all, to happen after a modal period of 4 years that, she believes, "reflects an ancestral strategy to remain pair-bonded at least long enough to raise a single infant through the period of lactation" (Fisher, 1991, p. 120). Liebowitz (1983) believes that romantic infatuation is associated with increased specific neurotransmitter activity that creates the sensations of euphoria and optimism that characterize this state and that this biochemical process is self-limited to 2 or 3 years, the same interval that Money (1980) and Tennov (1979) report as being characteristic of romantic attachment.

Ducklings are equipped with a species-specific "search image" which, in the presence of two moving objects at the critical time, causes them to imprint on the more **ducklike** (Goold, 1983, p. 266). But, the ducklings' search image is only schematic; any mother duck as well as many quite unsuitable surrogates (not normally present in the wild) can serve as releasers. The data reviewed herein suggest that the search image for human mate selection is similarly schematic; nearly any opposite-sexed individual of roughly siblinglike similarity might serve as a releaser. What we do not understand is the mechanism of human sexual imprinting or infatuation.

Do humans have critical periods for **infatuation?** (if we do, they are plural). Monogamous nonhuman animals like geese, wolves, or gibbons, pair up again when a mate dies. In our species also, an existing relationship seems to inhibit infatuation, and it may be that termination of a relationship initiates a period of renewed responsiveness. Unlike ducklings, however, even during a period of susceptibility, we do not imprint romantically on just any passing individual who falls within the range of our search criteria. Adolescence is assuredly a critical period, yet even adolescents do not become infatuated with every potential releaser. Having been reared together seems to inhibit romantic imprinting, but what affirmatively triggers the response?

Usually (although, alas, not always) we do not become infatuated with targets that are altogether beyond our grasp. Such evidence as the SO correlation within couples for physical attractiveness suggests that we tend to focus our search on individuals whom we perceive as in the same class of "mate-worthiness" as ourselves and, thus, as potentially available. We suspect that

attraction is often transmuted into genuine infatuation when it is reciprocated, that "I love you, too" or its equivalent is an important trigger mechanism (cf. Victor Herbert's lyric: "I think I could love someone madly, if someone would only love me!"). We shall not speculate further: it is an intriguing problem for further research.

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