

Dominance and Heterosexual Attraction

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Four experiments examined the relation between behavioral expressions of dominance and the heterosexual attractiveness of males and females. Predictions concerning the relation between dominance and heterosexual attraction were derived from a consideration of sex role norms and from the comparative biological literature. All four experiments indicated an interaction between dominance and sex of target. Dominance behavior increased the attractiveness of males, but had no effect on the attractiveness of females. The third study indicated that the effect did not depend on the sex of the rater or on the sex of those with whom the dominant target interacted. The fourth study showed that the effect was specific to dominance as an independent variable and did not occur for related constructs (aggressive or domineering). This study also found that manipulated dominance enhanced only a male's sexual attractiveness and not his general likability. The results were discussed in terms of potential biological and cultural causal mechanisms.

Concepts that refer to an individual's relative position in a social hierarchy occupy prominent positions in current models of personality and social behavior (Edelman & Omark, 1973; Hogan, 1979, 1982; Strayer & Strayer, 1976). It has been argued that terms such as dominance, status, position, ascendance, or surgency refer to universal features of human interaction. Hogan (1979), for example, suggests, "every primate and human group of modest complexity is organized in terms of a status hierarchy. Each member of the group knows who is most dominant or has the highest status, who is lowest, and where he or she stands in the hierarchy." White (1980) has recently gathered cross-cultural linguistic data that bear on the universality of status hierarchies; his analysis of personality descriptions in different language groups indicates that dominance-submission is a universal lexical feature of human languages.

The research reported here concerns the relation between behavioral expressions of dominance and the sexual attractiveness of males and females. Specific relations between dominance and attraction are predicted both by sociobiological theories that emphasize evolutionarily determined behavior tendencies and by sociocultural theories that emphasize socialization practices and sex role expectations.

Parental Investment, Sexual Selection, and Sexual Attraction

Wilson (1975) noted that dominance is a phylogenetically conservative trait within the primate order, occurring in all primate species. One explanation for the evolution of dominance hierarchies in primate societies is that males are compensated for their competitive striving by an increase in their sexual attractiveness to females. Males who are successful in achieving high rank are assumed to increase their reproductive success (Darwin, 1871), producing an increase in the proportion of

competitive males in each successive generation. Although females do compete for the opportunity to mate with the most desirable males, their reproductive success is less clearly related to their position on a dominance hierarchy (Daly & Wilson, 1983; Symonds, 1979; Wilson, 1975).

Evolutionary theory suggests that males and females should follow substantially different mating strategies to ensure reproductive success. Among mammalian species, females invest substantially more time, energy, and risk in reproduction than do males. Parental investment is typically defined (e.g., Trivers, 1972) as the activities a parent engages in to nurture and protect any offspring, which increase the offspring's reproductive success at the cost of limiting the parents' ability to invest in other offspring. As a consequence of their greater investment in gestating each offspring, females are capable of producing fewer offspring than males are. Among species with differential amounts of parental investment in mating, there is typically greater competition for mates among members of the sex investing less and a far greater degree of discrimination between potential mates among members of the sex investing more.

Applied to humans, this model suggests that females should be more discriminating than males in their choice of sexual partners. Female choice should be based on characteristics related to reproductive success; females should therefore be attracted to males who display characteristics that would enhance the viability of their offspring and would increase the offspring's chance of reproductive success. Males, in contrast, should be considerably less discriminating than females; because their investment is potentially smaller they should be attracted to a wider range of sexual partners and should be less likely than females to turn down a receptive sexual partner.

The presence of dominance hierarchies in humans has been traced in part to these processes of sexual selection.¹ Males who exhibit dominance may increase their genetic fitness through their increased ability to compete successfully for females. Fe-

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¹ *Sexual selection* refers to natural selection for morphological, physiological, or behavioral characteristics that increase an organism's chances of reproductive success (Darwin, 1871).

males may increase their fitness by selecting those males who could increase their offspring's viability. A female who mates with a dominant male may acquire a long-term genetic advantage, a short-term material advantage, or both. In the long term she may pass on to her offspring male genes that confer some advantage in competition for status and for resources. More immediately, she will gain some advantage from her mate's position with its increased access to resources, giving her offspring an immediate material advantage over the offspring of nondominant males.

The predicted relation between dominance and the sexual attractiveness of males has been observed in various primate species.² A number of observers have reported that dominant male baboons are more attractive to females than are less dominant males (DeVore, 1965; Saayman, 1971; Zuckerman, 1972). This same phenomenon has been reported for free-ranging rhesus monkeys (Carpenter, 1942) and savanna vervet monkeys (Struhsaker, 1967). Additionally, Goodall (1968) has observed that male chimpanzees' amorous approaches to females consist of those same behaviors that are used to communicate dominance in interactions with other males.

Sociocultural Explanations of Dominance-Attraction Relations

A relation between dominance and heterosexual attraction in humans may also be derived from an analysis of sex role expectations. Empirical studies of the behavioral correlates of sex roles in contemporary culture consistently indicate that dominance is an integral part of the male role and is consistently absent in descriptions of the female role. For example, Cicone and Ruble (1978) examined the results of seven published studies concerning the male role and found that the most frequently used words (mentioned in four or more studies) were adventurous, ambitious, independent, logical, aggressive, dominant, assertive, stable, courageous, interested in sex, self-confident, competitive, leader, individualistic, active, unemotional, and strong. The preponderance of words that relate to a male's ability to ascend a dominance hierarchy is striking. In a similar vein, Sawyer (1970) has suggested that the stereotypical male is a dominator-achiever. David and Brannon (1976) have identified four general imperatives that boys learn to identify with maleness as they mature: avoid typical female behavior, achieve success, do not be dependent on anyone else, and be aggressive.

Descriptions of traditional female role expectations either omit dominance as a relevant dimension or suggest that low dominance is an aspect of the feminine role. For instance, Broverman, Broverman, Clarkson, Rosenkrantz, and Vogel (1970) found that clinical professionals viewed the healthy woman as submissive and not competitive. The empirical literature on normative behavior for males and females thus suggests that striving for dominance and success (ascending a social hierarchy) is typically demanded of males and is frequently proscribed for females. As numerous theorists have pointed out, the existence of norms such as these implies the existence of an extrinsic social reward structure that reinforces acceptance of the norm and negatively sanctions deviations from it (Festinger, 1954). Such negative sanctions have in fact been found in studies of social penalties for sex role reversals. Costrich, Feinstein, Kidder, Marecek, and Pascale (1975) reported three studies in

which subjects evaluated men and women who behaved either in line with sex role stereotypes or counter to them. Their results indicated that the popularity of both passive dependent men and aggressive assertive women was adversely affected.

Overview and Predictions

The research described here was designed to explore the relation between dominance and sexual attractiveness for males and females. On the basis of both biological and cultural models, we predict that males exhibiting high-dominance behaviors will be rated as more attractive by females than will males exhibiting low-dominance behaviors. Evolutionary theory suggests that because of their potentially lower parental investment, males will be sexually attracted to receptive females irrespective of their level of dominance or status. Although females do compete for positions in status hierarchies, there is no available evidence to suggest that their achieved dominance or rank is positively related to their attractiveness to males.

Role-theoretic considerations can be used to predict an inverse relation between female dominance and sexual attractiveness. The simplest assumption, which has been partially supported by the Costrich et al. (1975) data on popularity, is that a given individual may be perceived as more attractive when behaving in a role-appropriate fashion and less attractive when behaving in a role-deviant fashion. The power of this hypothesis is, however, attenuated by (a) ongoing cultural changes in the female sex role such that dominance may no longer be considered antithetical to femininity and (b) situational norms that permit females to express dominance in specific contexts without violating sex role expectations.

In the first experiment, male and female college students were asked to rate the sexual attractiveness of opposite-sex models who engaged in either dominant or nondominant behavior.

Experiment 1

Method

Subjects. Subjects were 46 women and 42 men enrolled in an introductory psychology course at a western state university. Subjects' participation partially fulfilled 1 of 3 hr of suggested experimental participation.

Stimulus materials. Eight 1-min silent videotapes were made that depicted both men and women engaging in either low-dominance or high-dominance behavior. All videotapes displayed an interaction between same-sex individuals. Two different actresses and two different actors served as stimulus figures in the films; each played a low-dominance role in one interaction and a high-dominance role in another.

Dominance gestures in the performance were derived from criteria published by Mehrabian (1969). In the low-dominance condition, a constant male (CM) is shown seated at a desk in an office. An actor enters

² Male dominance is not invariably related to sexual attractiveness throughout the primate order. Such a relation obviously does not hold among species that do not display stable dominance hierarchies. Additionally, there exist primate species that do display dominance hierarchies but show no relation between male dominance and reproductive success (Kolata, 1976). However, such species are the exception (Wilson, 1975), and more important, we are aware of no evidence suggesting an inverse relation between male dominance and sexual attractiveness in primates.

the room and chooses a chair near the door approximately 6 ft (2 m) from the desk of the CM. The actor, clutching a sheath of papers, sits in symmetrical posture, leans slightly forward with head partially bowed, and alternately looks down at the floor and up at the CM. During an ensuing discussion, the actor engages in repetitive head nodding and lets the CM engage in longer communications.

In the high-dominance condition, the actor enters, chooses a chair closer to the CM and sits in a relaxed, asymmetrical posture. The actor's hands and legs are relaxed and his body is leaning slightly backward in the chair. During the discussion, the actor produced higher rates of gesturing and lower rates of head nodding than in the low-dominance condition. Identical films were made with actresses playing all roles. Within each sex, the same actor or actress played both dominant and nondominant roles.

Procedure. Subjects were told that the experiment involved people's abilities to assess personality when they had little information about a person. They were informed that they would be shown a silent videotape of a student entering a professor's office. The subjects were further told that we had given a series of psychological interviews and tests to the student and that their job was to attempt to guess what the student was "really like" (as ostensibly determined by our previous testing).

Each subject observed two films of opposite-sex persons: one of a target person engaging in high-dominance behavior and one of a different target person engaging in low-dominance behavior. The order of the videotape presentations was counterbalanced across subjects. Instructions were administered by an experimenter who was uninformed about the order of presentation and the hypothesis being tested.

Subjects were asked to rate each stimulus person on several 7-point bipolar scales, which included the dependent variables, and a number of filler items.

Dependent variables. The following 17 bipolar adjectives were used as dependent variables in the study: dominant-nondominant, sexually attractive-sexually unattractive, weak-strong, soft-hard, tough-tender, rugged-delicate, feminine-masculine, bad-good, warm-cold, nice-awful, pleasant-unpleasant, intelligent-unintelligent, ugly-beautiful, low income-high income, physically attractive-physically unattractive, and desirable as a date-undesirable as a date.

Each bipolar dimension was used as a 7-point scale. The dominant-nondominant dimension constituted a manipulation check. Two items measured attraction and constituted our central dependent variable: sexually attractive-sexually unattractive and desirable as a date-undesirable as a date. The remaining items were used both to reduce the demand characteristics of the study (by obscuring the central hypothesis under consideration) and to provide some convergent evidence for the effectiveness of the experimental manipulation.

Results

Manipulation check. Results on this item (displayed in Table 1) clearly supported the effectiveness of the manipulation, with target persons who displayed high-dominant behaviors being rated as significantly more dominant than target persons who displayed low-dominant behaviors, $F(1, 86) = 463.86, p < .0001$. The effect of the sex of the target person on this variable was nonsignificant, as was the Sex of Target Person \times Dominance interaction. In addition, both male and female targets were rated significantly ($p < .01$) higher on the following dimensions in the high-dominance condition: strong, hard, tough, rugged, and masculine.

Attraction measures. A multivariate analysis of variance (MANOVA) performed on the two central dependent variables, sexual attractiveness and dating desirability, showed the predicted Sex of Target Person \times Dominance interaction, indicating that high dominance selectively increased the attractiveness

Table 1
Experiment 1: Mean Values of Major Dependent Variables

Dominance condition	Sex of target	
	Female	Male
Dominance		
Low	2.14	2.19
High	5.69	6.05
Sexual attractiveness		
Low	4.33	3.20
High	4.43	4.15
Dating desirability		
Low	4.02	2.78
High	3.79	3.37

Note. Higher ratings on dependent variables indicate that subjects perceived target persons as more dominant, more sexually attractive, and more desirable as a date.

of male target persons, multivariate $F(2, 86) = 3.10, p < .05$. Univariate analyses of each dependent variable revealed that the Sex of Target Person \times Dominance interaction was significant for both the sexual-attraction scale, $F(1, 86) = 5.52, p < .02$, and the desire-to-date scale, $F(1, 86) = 4.82, p < .03$.

The analysis also yielded a main effect of sex of target person on the attraction items, multivariate $F(2, 86) = 5.75, p < .005$, indicating that female targets were rated as overall more attractive and more desirable as a date than were male targets. Examination of the means in Table 1 reveals that female attractiveness was not influenced by the dominance manipulation.

The MANOVA indicated a significant main effect for the dominance manipulation, with high-dominance targets rated as significantly more sexually attractive and more desirable as a date than low-dominance targets. This effect was due to the difference in attractiveness between high-dominance and low-dominance men. In accord with predictions, there was a simple main effect for male targets on both attraction items, $F(1, 86) = 8.88, p < .01$. The simple main effect for women was not significant, $F(1, 86) = 1.06, p < .31$.

Discussion

The results of Experiment 1 supported the hypothesis that dominance behavior enhances the sexual attractiveness of males. The converse effect hypothesized for females did not occur. The finding that female targets were rated significantly more sexually attractive and more desirable as dates than were male targets is consonant with the sociobiological premise that females should be more choosy than males.

Despite the fact that the data for males supported predictions derived from both biological and cultural models, these results might be open to alternative explanation because of the particular methodology used in this study. Although the manipulation check suggests that the female target persons were as successful as the males in communicating dominance, it is possible that the males may have simultaneously displayed other behaviors in the dominant tapes that conveyed sex appeal. Because the

videotaped presentation potentially allowed more than one factor to vary, this possibility cannot be ruled out. A conceptual replication was conducted to reduce the possibility that subjects made attributions in addition to dominance that influenced the target's perceived attractiveness. Experiment 2 was thus a totally between-groups design using a procedure that eliminated the potential confounds inherent in the videotaped presentation. In this case, subjects read identical descriptions of male and female target persons, varying only with respect to the sex of the person described. Experiment 2 also allows an additional test of the hypothesis that competitive dominance-seeking behavior exerts a negative influence on the heterosexual attractiveness of females. In contrast to Experiment 1, the procedure used in the following experiment explicitly labels the target's behavior as either high or low in dominance.

Experiment 2

Method

Subjects. Subjects were 86 women and 82 men enrolled in introductory psychology at a western state university.

Procedure. Subjects read instructions informing them that we were interested in their "ability to form accurate impressions of others when one has only very limited information to go on."

Female subjects then read a description of a male student designed either to be dominant:

John is 5'10" tall, 165 lbs. He has been playing tennis for one year and is currently enrolled in an intermediate tennis class. Despite his limited amount of training he is a very coordinated tennis player, who has won 60% of his matches. His serve is very strong and his returns are extremely powerful. In addition to his physical abilities, he has the mental qualities that lead to success in tennis. He is extremely competitive, refusing to yield against opponents who have been playing much longer. All of his movements tend to communicate dominance and authority. He tends to psychologically dominate his opponents, forcing them off their games and into mental mistakes.

or nondominant:

John is 5'10" tall, 165 lbs. He has been playing tennis for one year and is currently enrolled in an intermediate tennis class. Despite his limited amount of training he is a very coordinated tennis player, who has won 60% of his matches. His serve and his returns are consistent and well placed. Although he plays well, he prefers to play for fun rather than to win. He is not particularly competitive and tends to yield to opponents who have been playing tennis much longer. He is easily thrown off his game by opponents who play with great authority. Strong opponents are able to psychologically dominate him, sometimes forcing him off his game. He enjoys the game of tennis but avoids highly competitive situations.

Men read one of two descriptions that were identical except that the target person was named Barbara and was described as 5'6", 118 lbs.

Subjects then rated the target person on a "personality impression rating" that included the same items described in Experiment 1.

Results

Manipulation check. Results on this item (displayed in Table 2) again supported the effectiveness of the dominance manipulation, $F(1, 167) = 280.00, p < .0001$. There was neither a main effect of sex of target person nor a Sex of Target Person \times Dominance interaction. Both male and female targets were rated as significantly ($p < .01$) higher on the following dimensions in the

Table 2

Experiment 2: Mean Values of Major Dependent Variables

Dominance condition	Sex of target	
	Female	Male
Dominance		
Low	2.47	2.40
High	5.98	6.42
Sexual attractiveness		
Low	4.77	4.05
High	4.77	5.37
Dating desirability		
Low	4.65	3.49
High	4.33	4.56

Note. Higher ratings on dependent variables indicate that subjects perceived target persons as more dominant, more sexually attractive, and more desirable as a date.

high-dominance condition: strong, hard, rugged, tough, cold, intelligent, high income, high status, and masculine.

Attraction measures. Results for these items again supported the hypothesis regarding dominance and male attraction. A MANOVA performed on the two principal dependent measures yielded a significant Sex of Target Person \times Dominance interaction, multivariate $F(2, 167) = 8.87, p < .001$. Univariate analyses of each dependent variable revealed that this interaction was significant for both the sexual-attraction scale, $F(1, 167) = 16.1, p < .001$, and the desire-to-date scale, $F(1, 167) = 10.2, p < .002$. As expected, the simple main effect for the male target person indicated that the dominant man was rated as significantly more sexually attractive, $F(1, 167) = 30.99, p < .001$, and significantly more desirable as a date, $F(1, 167) = 11.99, p < .001$, than the nondominant man. An analysis of simple main effects for female targets indicated that dominance had no significant effect on either the sexual-attractiveness or the desire-to-date scale, multivariate $F(1, 167) = .81, p < .44$.

The MANOVA also indicated a significant main effect for the dominance manipulation, with high-dominance targets rated as significantly more sexually attractive and more desirable as a date than low-dominance targets. Examination of the means in Table 2 indicate that this effect is due to the difference between high- and low-dominance men.

Discussion

The results of Experiment 2 are directly in line with those of the first experiment. Males described as dominant were again rated as more attractive than nondominant males, and a parallel effect did not appear for females. The failure to find support for our second hypothesis, that females would be rated more attractive in the low-dominance condition, may have resulted from the context of the target person's actions.

Female target persons in both Experiments 1 and 2 were in a context where dominance was displayed only toward other females. Perhaps a somewhat different picture might have emerged had subjects rated females who were dominant over

males, indicating that it is in competition with males where females violate the normative expectations that they be submissive and noncompetitive (Broverman et al., 1970; Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972), and it is only in this case that their attractiveness suffers. A third experiment was conducted to examine this possibility.

Experiment 3

Method

Experiment 3 was identical to Experiment 2, with two exceptions. First, subjects (107 women and 96 men enrolled in introductory psychology at a western state university) were exposed to descriptions of same-sex as well as opposite-sex target persons. In addition, the descriptions were modified to suggest that the playing opponents of the target person were either male or female. Dependent variables were essentially the same as those used in the earlier research, but the dating-desirability item was modified to suggest that the subject should estimate the target person's desirability to someone of the opposite sex. Thus, the design of Experiment 3 was a 2 (sex of target person) \times 2 (dominance) \times 2 (sex of opponent) \times 2 (sex of subject) factorial design.

Results

Manipulation check. The manipulation check showed the expected main effect of the dominance manipulation, $F(1, 199) = 477.848, p < .0001$. No other main effects or interactions were significant for this variable.

Attraction ratings. A MANOVA indicated that the predicted Sex of Target Person \times Dominance interaction was again found, $F(2, 199) = 3.61, p < .05$. Univariate analyses indicated a significant effect for ratings of sexual attractiveness, $F(1, 199) = 7.67, p < .01$. Again, as shown in Table 3, the pattern of means indicates that the dominance manipulation selectively increased attraction ratings for the male target person. A similar trend was found for the dating-desirability item, which showed an $F(1, 199) = 3.17, p < .08$, for the same interaction. As in the earlier experiments, a simple main effect of dominance was found for male subjects on the sexual-attractiveness item, $t(106) = 2.8, p < .01$. If the dominance manipulation had a differential effect on the female target's attractiveness when she was in competition with men (as opposed to women), this would have shown up as a Sex of Target Person \times Dominance \times Sex of Opponent interaction. This interaction yielded F values of less than 1 for both variables. The higher order interaction, sex of target person by dominance by sex of opponent by sex of subject, likewise yielded an F of less than 1 for the sexual-attractiveness item and an $F(1, 199) = 1.33$ for the dating-desirability rating. No other effects reached significance for either variable.

Experiment 4

A central interpretative problem in this research concerns the conceptual status of the independent variables that were manipulated. We have used the term *dominance* to refer both to the nonverbal behaviors manipulated in Experiment 1 and to the personality descriptions manipulated in Experiments 2 and 3. Although these manipulations influenced the perceived attractiveness of males in all three studies, it would be inappropriate to conclude that any manipulation of dominance will result in analogous effects on attraction. It is clear that the term *domi-*

Table 3

Experiment 3: Mean Values of Major Dependent Variables According to Target Sex and Dominance Condition

Dominance condition and sex of target	Sex of opponent		<i>M</i>
	Female	Male	
Dominance			
Low			
Female	2.37	2.21	2.29
Male	2.57	2.48	2.52
High			
Female	6.04	5.80	5.92
Male	6.08	6.30	6.20
Sexual attractiveness			
Low			
Female	5.26	5.07	5.16
Male	4.43	4.76	4.6
High			
Female	4.89	4.92	4.90
Male	4.88	5.52	5.20
Dating desirability			
Low			
Female	5.15	4.93	5.04
Male	4.29	4.55	4.42
High			
Female	4.98	4.72	4.75
Male	4.50	4.96	4.75

nance is semantically close to several other concepts and has multiple behavioral referents (Buss & Craik, 1980). The behaviors used in Experiment 1 to communicate dominance also communicated relaxation. Other ways of signaling dominance might involve assertive gestures, physical aggression, authoritative verbal remarks, or a domineering personal style. It remains unclear whether other behavioral expressions of dominance would have analogous or parallel effects on heterosexual attraction.

Previous empirical studies of the social consequences of dominant behavior have tended to obscure the distinction between dominance and semantically related concepts. For example, Costrich et al. (1975) examined the relation between dominance and popularity in male and female targets. Costrich et al. equated high dominance with aggression and self-assertion; they found that dominance tended to improve the popularity of men and decrease the popularity of women. The difference between the results Costrich et al. found for female targets and our own results may be due to the difference in dependent variables (general popularity vs. sexual attraction), or it may be due to their equation of the (independent variable) dominance with aggressiveness.

In a fourth experiment we attempt to distinguish the influence of dominance from two semantically related concepts, *aggression* and *domineering*. We chose to compare the concept aggression with dominance because aggressiveness has been equated with dominance in previous empirical studies and because aggressiveness is commonly used to describe the difference between male and female sex roles. Domineering was compared to dominance because it refers to an individual who

makes excessive attempts to control the behavior of others. In this study, subjects rated opposite-sex targets who were described as high or low on dominance, aggression, or domineering. On the basis of our previous studies, we expected that dominance would increase the sexual attractiveness of men but not of women. Aggressive and domineering tendencies were not expected to enhance the attractiveness of either sex.

Method

Subjects. Subjects were 114 women and 104 men enrolled in undergraduate psychology classes.

Procedure. As in Studies 2 and 3, subjects were told that we were interested in their ability to make accurate personality judgments when given only a small amount of information about another person. Each subject was given a brief personality description of an opposite-sex individual, in the following form:

Jennifer C. is a college student who received a high score on the Dominance subscale of the *California Personality Inventory*. A high score on this scale indicates that the person would be characterized by the following adjectives: powerful, commanding, authoritative, high in control, masterful, ascendant.

Subjects in the low-dominance condition received a similar profile, except that the person was described as not powerful, obedient, not authoritative, avoids controlling others, yielding, and submissive. The high-aggressive target was described as hostile, belligerent, quarrelsome, argumentative, angry, and violent, and the low-aggressive target was described as nonhostile, conciliatory, accommodating, nonargumentative, low in anger, and nonviolent. Subjects exposed to the high-domineering profile read about someone who was characterized as overbearing, oppressive, bossy, dictatorial, arrogant, and high-handed, and finally, subjects in the low-domineering condition saw the target described as timid, gentle, cooperative, democratic, humble, and deferential. The adjectives for each of the distinctive descriptions were taken from the 1977 *Douglas Roget's Thesaurus*.

Dependent variables. Subjects filled out an overall personality rating of the target person that contained 41 bipolar adjectives. Three clusters (of seven bipolar scales each) served as manipulation checks (e.g., for aggressiveness, aggressive-nonaggressive, hostile-nonhostile, and five others, and similar clusters for dominance and domineering). Sexual attractiveness was measured with the same items used in the earlier studies. Likability was measured with an aggregate of three scales (warm-cold, pleasant-unpleasant, and likable-unlikable). Three items tapped the target's perceived stability (stable-unstable, well-adjusted-poorly adjusted, and emotionally stable-unstable). Competence was measured with the items intelligent-unintelligent and competent-incompetent; perceived social class was measured with the two items wealthy-poor and upper class-lower class. Finally, two items were combined to measure perceived promiscuity (very interested in sex-uninterested in sex, promiscuous-not promiscuous). All items were measured with 9-point scales.

Results

Manipulation check. Analyses of variance (ANOVAs) performed on three composite scores reflecting subject ratings of the target's dominant, aggressive, and domineering tendencies indicated that all three experimental manipulations were successful ($p < .0001$ for each F value).

Sexual attraction. A 2 (sex of subject) \times 3 (type of trait description: aggressive, dominant, or domineering) \times 2 (high vs. low standing on trait description) ANOVA of the dimension of sexual attractiveness revealed a significant three-way interac-

Table 4
Effect of Level of Each Independent Variable
on Rated Sexual Attractiveness

Independent variable	Sex of target	
	Female	Male
Dominance		
Low	4.63	3.28
High	4.38	5.55
Domineering		
Low	4.17	4.12
High	4.41	3.89
Aggressiveness		
Low	4.76	3.84
High	4.56	4.38

tion, $F(2, 213) = 3.32, p < .04$. Manipulation of the level within the aggressive and domineering cells produced no differential effects on sexual attraction. These factors also did not differentially affect the sexual attractiveness of male and female targets (all F values for Sex \times Aggression and Sex \times Domineering simple interactions were less than 1).

A different pattern emerged for manipulations of dominance. The main effect of dominance on sexual attractiveness was significant, $F(1, 66) = 8.12, p < .01$. This main effect was produced by differences in rated attractiveness of men in high- as opposed to low-dominance conditions. Consistent with the results of Experiments 1 through 3, there was a significant Sex \times Dominance interaction, $F(1, 66) = 9.79, p < .01$, with men rated as more attractive in the high-dominance condition. A test of simple main effects for male targets was significant, $F(1, 36) = 17.17, p < .01$. Females targets did not vary significantly as a function of dominance level. The impact of each independent variable on rated sexual attractiveness is depicted in Table 4.

Results for the dimension of physical attractiveness were similar to the results for sexual attraction. Neither the aggression nor the domineering factor produced an effect on physical attraction. Level of dominance did, however, influence attributions of physical attraction, $F(1, 69) = 6.62, p < .01$, and this main effect was again moderated by an interaction of sex and dominance level, $F(1, 69) = 4.42, p < .01$. Once again, a test of the simple main effects indicated an effect only for men, who were rated as more physically attractive in the high-dominance condition only, $F(1, 37) = 12.71, p < .01$.

Dominance. Manipulation of the level of dominance produced a constellation of personality attributions. In addition to its impact on variables related to sexual attraction, the level of dominance significantly influenced attributions concerning the target's likability, stability, promiscuity, competence, and social class.

High dominance was found to lower the general likability of the target person, $F(1, 64) = 38.7, p < .001$. There was neither an effect of sex nor any interaction between dominance and sex on this variable. This result indicates that for men there is a potential trade-off between sexual attractiveness and likability, with high dominance increasing the former but reducing the latter.

Dominance was also found to increase the rated stability of

the target person, $F(1, 64) = 13.7, p < .001$, and to do so similarly for both sexes.

High dominance led to perceptions of greater promiscuity in the target, $F(1, 66) = 10.86, p < .002$, with high dominance associated with increased promiscuity. A significant Sex \times Level of Magnitude interaction, $F(1, 66) = 5.36, p < .02$, indicated that men were perceived as more promiscuous in the high-dominance condition than were women.

Dominance level increased the perceived competence and the perceived social class of targets. ANOVAs conducted on competence and social class composite scores revealed significant main effects, $F(1, 67) = 25.82, p < .001$, and $F(1, 67) = 30.86, p < .001$, respectively, with high scores associated with increases in competence and social class. Neither an effect of sex nor a Sex \times Level interaction was observed on either of these variables.

To summarize, the following influence of dominance level was observed. High dominance increased the rated sexual attractiveness and physical attractiveness of male targets but had no discernable influence on the sexual or physical attractiveness of female targets. High dominance substantially decreased the likability of both sexes and was associated with increases in the rated stability, competence, promiscuity, and social class of both sexes.

Domineering. Although manipulation of this variable had no effect on the sexual attractiveness or physical attractiveness attributed to targets, it did have a pronounced impact on the target's perceived likability, stability, promiscuity, social class, and desirability as a spouse.

The strongest effect of the domineering manipulation was on the target's likability, $F(1, 68) = 279.32, p < .001$, with high scores associated with decreased likability. There was neither an effect of sex nor a Sex \times Level interaction.

A parallel and perhaps related result was found on the desirable-as-a-spouse dimension. High-domineering targets were perceived to be significantly and substantially less desirable as spouses, $F(1, 68) = 225.45, p < .001$. There was neither an effect of sex nor a Sex \times Level interaction.

High-domineering targets were assumed to be members of a higher social class than were low-domineering targets, $F(1, 68) = 225.45, p < .001$.

High-domineering targets were also assumed to be more promiscuous than were low-domineering targets, $F(1, 68) = 28.06, p < .001$. A significant main effect of sex on this variable indicated that female targets were perceived to be less promiscuous than were male targets, $F(1, 68) = 4.95, p < .001$. No Sex \times Level interaction was found.

High-domineering targets were assumed to be significantly less stable than low-domineering targets, $F(1, 68) = 17.37, p < .001$. Neither an effect of sex nor a Sex \times Level interaction was observed on this variable.

To summarize, the domineering manipulation did have a significant impact on attributions about the target's personality, but it did not interact with the sex of the target. High-domineering targets of both sexes were assumed to be less likable, less desirable as spouses, less stable, more promiscuous, and of a higher social class than their low-domineering counterparts.

Aggressiveness. Manipulation of the target person's perceived aggressiveness produced attributions similar to those produced by the domineering manipulation. Level of aggressiveness

had no effect on the measures of sexual or physical attraction; it did, however, influence the target's perceived likability, stability, promiscuity, and desirability as a spouse.

The strongest effect of the aggressiveness manipulation concerned the target's likability, $F(1, 74) = 247.31, p < .001$, with high aggressiveness associated with greatly decreased likability. There was neither an effect of sex nor a Sex \times Level interaction.

Targets who were described as highly aggressive were also assumed to be less stable, $F(1, 74) = 50.04, p < .001$, than were low-aggressive targets.

Level of aggressiveness was found to influence the perceived promiscuity of targets; high aggression was associated with increased promiscuity, $F(1, 74) = 14.89, p < .001$. Neither an effect of sex nor a Sex \times Level interaction was observed.

Level of aggressiveness influenced the target's desirability as a spouse; targets described as low in aggressiveness were strongly preferred, $F(1, 74) = 59.84, p < .001$. No Sex \times Level interaction was observed.

To summarize, highly aggressive targets were perceived to be relatively less likable, less stable, more promiscuous, and less desirable as spouses. These effects did not differ as a function of the target's sex.

Analysis of covariance. The preceding analysis indicated that the independent variables dominance, aggressiveness, and domineering produced similar patterns of attributions on all variables except for those related to sexual attractiveness. Examination of the degree of intercorrelation between the manipulation checks for these variables also indicated a substantial similarity between these concepts. The average intercorrelation of manipulation checks for dominance, aggression, and domineering was above .80 in each experimental condition.

As a further test of the hypothesized linkage between dominance and sexual attractiveness, we attempted to partial out the effects of aggression and domineering. In the dominance condition, an ANOVA was conducted on the manipulation check dominant-not dominant, with aggression and domineering composite scores used as covariates. This analysis revealed a main effect for dominance, $F(1, 64) = 35.1, p < .001$, indicating that the dominance manipulation produced an impact on rated dominance that was independent of the variance contributed by aggression and domineering.

This analysis was then repeated on all dependent variables found to be significant in the original analysis, with aggression and domineering used both singly and in combination as covariates. The results of these analyses of covariance were essentially the same as the ANOVAs reported earlier. The relation between dominance and sexual attractiveness strengthened (nonsignificantly) when aggression and domineering were used as covariates; the F value for the predicted Sex \times Dominance interaction changed from $F(1, 66) = 9.79$ to $F(1, 66) = 11.14$. The only variable that displayed a substantially different pattern of results in the covariance analysis was that of likability. As noted, the initial ANOVA showed dominance to be strongly, $F(1, 64) = 38.7$, associated with decreased likability of targets of both sexes. With aggression and domineering covaried out, however, this negative relation between manipulated dominance and likability was removed, $F(1, 64) = .202$. When dominance was considered independently of the related concepts of aggression and domineering, it produced no impact on the likability of targets. These latter variables appear also to attenuate to some

degree the relation between dominance and sexual attractiveness.

General Discussion

The results of all four experiments supported the prediction that dominance behavior would selectively increase the sexual attractiveness of males. No support was found for the notion that female attractiveness would be inversely related to dominance. The positive relation between dominance and attractiveness for males was robust. Combining the results of the four studies reported here by the Stouffer method (Rosenthal, 1978) yields a probability value of $p < .00001$ for the relation between dominance and male heterosexual attractiveness. The same analysis performed on the relation between female dominance and heterosexual attractiveness yields a nonsignificant probability value of $p < .29$.

The failure to find some relation between behavioral expressions of dominance and female attractiveness is intriguing. As noted, the predictions generated by a simple sex role stereotype model were not supported by the data. Although counternormative (low dominance) behavior in males was associated with relatively lowered attractiveness ratings, females who displayed counternormative (high dominance) behavior were not rated as less attractive. Manipulation checks indicated that females were as adept as males at expressing dominance.

One possible explanation for the observed pattern of results is that among contemporary college students, where women daily compete directly with men for success, the female role does not proscribe high dominance or competitive success. If dominance is not counternormative for college women, it should not influence their perceived attractiveness. The usefulness of this interpretation rests on the assumption that college women are allowed to act in a traditionally masculine fashion. Manipulation checks indicated that women were rated as significantly stronger, harder, tougher, more rugged, and more masculine in the high-dominance condition. Inspection of the means indicated that women were not only rated relatively more masculine in the high-dominance condition but they were also rated as slightly more masculine than feminine. Despite these descriptions, female targets were rated as no less attractive when displaying high dominance. Because previous studies have shown that women are derogated for being dominant (Buss, 1981; Gough, 1968), our findings underscore the importance of distinguishing between heterosexual attraction and other measures of liking or popularity.

In this regard, it should be noted that sociocultural and sociobiological theories were not designed to deal with the same phenomena. The sociobiological perspective centers on sexual attractiveness whereas the sociocultural does not. From the latter perspective, people who behave in accord with the perceiver's expectancies may be evaluated more positively, but there is nothing explicit in a sociocultural perspective that predicts that fulfillment of expectancies is specifically related to heterosexual attraction.

The evolutionary perspective that stimulated this research suggests that an important element in heterosexual attraction concerns an individual's position in a dominance hierarchy. Actual dominance in different groups would most likely be communicated via different behaviors. Wilson (1975), in a discus-

sion of the biological determinants of dominance, noted, "The greater the size of the brain and the more flexible the behavior, the more numerous are the determinants of rank and the more nearly equal they are in influence" (p. 291). Wynne-Edwards (1962) and Pfeiffer (1969) have suggested that among humans the ability to impress and win deference from others depends on the sum of many qualities, including strength, skill, determination to achieve superiority, and intelligence.

The results of our fourth experiment suggest that some of the behaviors that may lead to a high rank do not themselves promote an individual's attractiveness. Aggressive and domineering tendencies did not increase the sexual attractiveness of either males or females. The covariance analysis suggests that the highest levels of sexual attractiveness should occur when males express dominance without the use of such behaviors. Furthermore, dominance increases the sexual attractiveness of males but does not produce a general halo effect. Individuals simply described as dominant were assumed to be also aggressive and domineering; they were regarded as less likable and were not desired as spouses.

In this study we have derived hypotheses from both biological and cultural models. Traditional biological explanations suggest that male dominance is an attribute whose genetic mechanism spread because it conferred a reproductive advantage to its carriers. Support for a biological model lies in data that suggest that dominance hierarchies are universal in human societies (Lumsden & Wilson, 1981); dominance appears to be an attribute of the male role in all human cultures (Maccoby & Jacklin, 1974); male sex hormones are associated with an increased masculinization of anatomical and behavioral traits, including an increase in dominance behaviors and the attainment of rank (Ehrhardt & Meyer-Bahlburg, 1980; Rose, Gordon, & Bernstein, 1972; Rose, Holaday, & Bernstein, 1971; Rubin, Reinisch, & Haskett, 1980); display of rank, skill, and achievement by men are commonly part of the human courtship ritual (Daly & Wilson, 1983); and females appear to be attracted to dominant males in the majority of primate species (Symonds, 1979; Wilson, 1975).

In recent years a number of reviewers have noted the relevance of evolutionary concepts to questions at the interface of personality and relationship formation (Buss, 1985; Kenrick & Trost, 1987; Rushton, 1985; Rushton, Russell, & Wells, 1984), and it has been suggested that such a perspective could provide a valuable beginning for organizing the often scattered empirical findings in the personality and social psychological literature (Buss, 1984; Cunningham, 1981; Kenrick, 1987; Kenrick & Dantchik, 1983; Kenrick, Montello, & MacFarlane, 1985). The experiments described here provide preliminary evidence that individual differences in dominance, competitiveness, and rank are important aspects of heterosexual attraction. Given the central importance of such concepts in biological explanations of attraction, their role in human courtship merits further examination.

References

- Broverman, I. K., Broverman, D. M., Clarkson, F. E., Rosenkrantz, P. S., & Vogel, S. R. (1970). Sex-role stereotypes and clinical judgments of mental health. *Journal of Consulting and Clinical Psychology*, 34, 1-7.

- Broverman, I. K., Vogel, S. R., Broverman, D. M., Clarkson, F. E., & Rosenkrantz, P. A. (1972). Sex-role stereotypes—a current appraisal. *Journal of Social Issues*, 28, 59–79.
- Buss, D. M. (1981). Sex differences in the evaluation and performance of dominant acts. *Journal of Personality and Social Psychology*, 40, 147–154.
- Buss, D. M. (1984). Evolutionary biology and personality psychology: Toward a conception of human and individual differences. *American Psychologist*, 39, 1135–1147.
- Buss, D. M. (1985). Human mate selection. *American Scientist*, 73, 47–51.
- Buss, D. M., & Craik, K. H. (1980). The frequency concept of disposition: Dominance and prototypically dominant acts. *Journal of Personality*, 48, 379–392.
- Carpenter, C. R. (1942). Sexual behavior of free-ranging rhesus monkeys (*Macaca mulatta*). *Journal of Comparative Psychology*, 33, 113–142.
- Cicone, M. V., & Ruble, D. N. (1978). Beliefs about males. *Journal of Social Issues*, 34, 5–16.
- Costrich, N., Feinstein, J., Kidder, L., Marecek, J., & Pascale, L. (1975). When stereotypes hurt: Three studies of personality for sex role reversals. *Journal of Experimental Social Psychology*, 11, 520–530.
- Cunningham, M. R. (1981). Sociobiology as a supplementary paradigm for social psychological research. In L. Wheeler (Ed.), *Review of Personality and Social Psychology* (Vol. 2, pp. 69–106). Beverly Hills, CA: Sage.
- Daly, M., & Wilson, M. (1983). *Sex evolution and behavior* (2nd ed.). North Scituate, MA: Duxbury.
- Darwin, C. (1871). *The descent of man and selection in relation to sex*. New York: Appleton.
- David, D., & Brannon, R. (1976). The male sex role: Our culture's blueprint for manhood and what it's done for us lately. In D. David & R. Brannon (Eds.), *The forty-nine percent majority: The male sex role* (pp. 1–45). Reading, MA: Addison-Wesley.
- DeVore, B. I. (1965). *Primate behavior: Field studies of monkeys and apes*. New York: Holt, Rinehart & Winston.
- Edelman, M. S., & Omark, D. R. (1973). Dominance hierarchies in young children. *Social Science Information*, 12, 103–110.
- Ehrhardt, A. A., & Meyer-Bahlburg, H. F. L. (1980). Effects of prenatal sex hormones on gender related behavior. *Science*, 211, 1312–1318.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7, 117–140.
- Goodall, J. (1968). The behavior of free-living chimpanzees in the Gombe Stream Research Center. *Animal Behavior Monographs*, 1, 165–311.
- Gough, H. G. (1968). An interpreter's syllabus for the California Psychological Inventory. In P. McReynolds (Ed.), *Advances in psychological assessment* (Vol. 1, pp. 111–133). Palo Alto, CA: Science and Behavior Books.
- Hogan, R. (1979). Of rituals, roles, cheaters, and spoilsports. *Johns Hopkins Magazine*, 30, 46–53.
- Hogan, R. (1982). A socioanalytic theory of personality. In M. Page & R. Dienstbier (Eds.), *Nebraska Symposium on Motivation* (pp. 55–89). Lincoln: University of Nebraska Press.
- Kenrick, D. T. (1987). Gender, genes, and the social environment. In P. C. Shaver & C. Hendrick (Eds.), *Personality and Social Psychology Review* (Vol. 6, pp. 6–27). Beverly Hills, CA: Sage.
- Kenrick, D. T., & Dantchik, A. (1983). Interactionism, idiographics, and the social psychological invasion of personality. *Journal of Personality*, 51, 286–307.
- Kenrick, D. T., Montello, D. R., & MacFarlane, S. (1985). Personality: Social learning, social cognition, or sociobiology? In R. Hogan & W. Jones (Eds.), *Perspectives in Personality* (Vol. 1, pp. 201–234). Greenwich, CT: JAI Press.
- Kenrick, D. T., & Trost, M. R. (1987). A biosocial theory of relationship formation. In D. Byrne & K. Kelley (Eds.), *Males, females, and sexuality: Theory and research* (pp. 59–100). Albany, NY: SUNY Press.
- Kolata, G. B. (1976). Primate behavior: Sex and the dominant male. *Science*, 191, 55–56.
- Lumsden, C. J., & Wilson, E. O. (1981). *Genes, mind and culture: The coevolutionary process*. Cambridge, MA: Harvard University Press.
- Maccoby, E. E., & Jacklin, C. N. (1974). *The psychology of sex differences*. Stanford, CA: Stanford University Press.
- Mehrabian, A. (1969). Methods and designs: Some referents and measures of nonverbal behavior. *Behavioral Research Methods and Instruments*, 1, 203–207.
- Pfeiffer, J. E. (1969). *The emergence of man*. New York: Harper & Row.
- Rose, R. M., Gordon, T. P., & Bernstein, I. S. (1972). Plasma testosterone levels in the male rhesus: Influences of sexual and social stimuli. *Science*, 128, 643–645.
- Rose, R. M., Holaday, I. W., & Bernstein, I. S. (1971). Plasma testosterone dominance rank and aggressive behavior in male rhesus monkeys. *Nature*, 231, 366–368.
- Rosenthal, R. (1978). Combining results of independent studies. *Psychological Bulletin*, 85, 185–193.
- Rubin, R. T., Reinisch, J. M., & Haskett, R. F. (1980). Postnatal gonadal steroid effects on human behavior. *Science*, 211, 1318–1324.
- Rushton, J. P. (1985). Differential K theory: The sociobiology of individual and group differences. *Personality and Individual Differences*, 6, 441–452.
- Rushton, J. P., Russell, R. J. H., & Wells, P. A. (1984). Genetic similarity theory: Beyond kin selection. *Behavior Genetics*, 14, 179–193.
- Saayman, G. S. (1971). Behavior of the adult males in a troop of free-ranging chacma baboons (*Papio ursinus*). *Folia Primatologica*, 15, 36–57.
- Sawyer, J. (1970). On male liberation. *Liberation*, 15, 32–33.
- Strayer, F. F., & Strayer, J. (1976). An ethological analysis of social agonism and dominance relations among preschool children. *Child Development*, 47, 980–989.
- Struhsaker, T. T. (1967). Behavior of vervet monkeys (*Cercopithecus aethiops*). *University of California Publications in Zoology*, 82, 1–64.
- Symonds, D. (1979). *The evolution of human sexuality*. New York: Oxford University Press.
- Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man* (pp. 136–179). Chicago: Aldine-Atherton.
- White, E. M. (1980). Conceptual universals in interpersonal language. *American Anthropologist*, 82, 759–781.
- Wilson, E. O. (1975). *Sociobiology: The new synthesis*. Cambridge, MA: Belknap/Harvard University Press.
- Wynne-Edwards, U. C. (1962). *Animal dispersion in relationship to social behavior*. London: Oliver & Boyd.
- Zuckerman, I. (1972). *The social life of monkeys and apes*. New York: Holt, Rinehart & Winston.

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