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Dominance, Prosocial Orientation, and Female Preferences: Do Nice Guys Really Finish Last?

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Three multimethod studies (total $N = 348$) probed the hypothesis that women's attraction to men would be influenced by male prosocial orientation. In Study 1, prosocial men were rated as more physically and sexually attractive, socially desirable, and desirable as dates than were nonprosocial men. Dominant men were no more attractive than low-dominance men, and male dominance did not interact with male prosocial orientation in eliciting attraction from women. In Study 2, prosocial orientation was manipulated to avoid "personalism," but still affected attraction. Across all measures attraction was an interactive function of dominance and prosocial tendencies. Dominance alone did not increase any form of attraction measured. In Study 3, male prosocial tendencies and dominance interacted to affect women's attraction to men. Results are discussed in terms of the place of altruism and dominance in evolutionary approaches to human interpersonal attraction.

It is generally known that individuals prefer the company of some people more than others. Social selectivity is pervasive; it is not restricted to humans, or even mammals (Bernstein, 1980; Ellis, 1992). One especially important form of selectivity in humans involves choice of conjugal or romantic partners (D. M. Buss, 1989, 1992; Ellis, 1992). Such choices influence the kinds of physical and psychological environments the chooser will experience (Snyder & Ickes, 1985), and the potential reproductive consequences are powerful.

Despite the importance of such choices, we are just beginning to develop comprehensive explanations for processes underlying human mate selection (D. M. Buss, 1989, 1995; D. M. Buss & Schmitt, 1993; Cunningham, 1986; Cunningham, Barbee, & Pike, 1990; Cunningham, Roberts, Barbee, Druen, & Wu, 1995; Kenrick & Keefe, 1992; Kenrick & Trost, 1989). Evolutionary theory provides one comprehensive explanation for so-

cial selectivity in terms of Darwin's (1871) notion of sexual selection. In intrasexual selection, individuals of one sex compete for mating opportunities with individuals of the other sex. In intersexual selection, individuals of one sex prefer individuals of the other sex who have certain attributes (e.g., in birds, colorful plumage). Darwin called this latter form of selection "female choice" because he believed that females of many species are more selective in choosing mating partners than are males (cf. Small, 1992).

Trivers (1972) refined Darwin's notion by suggesting that one driving force in intersexual selection is different investment in offspring by males and females. According to Trivers, in the vast majority of species females make much larger contributions to the survival of their offspring than do males. Consequently, females adopt a reproductive strategy in which they limit sexual contact to males who would be most likely to give an advantage to any offspring (cf. Small, 1992). Trivers noted that females may selectively mate with dominant males because the female can ally her genes with "a male who, by his ability to dominate other males, has demonstrated his reproductive capacity" (p. 170).

Trivers's (1972) conjectures were based largely on the behavior of nonhuman animals, mostly birds. Some empirical research based on human behavior has begun (e.g., D. M. Buss, 1989; D. M. Buss & Barnes, 1986), but nearly all of this work is correlational or based on self-reports or responses to vignettes. Almost no research has allowed women to observe patterns of male behavior, from which they could draw their own conclusions and express their preferences.

A major exception is the sophisticated multimethod program of research by Sadalla, Kenrick, and Vershure (1987). In four studies, Sadalla et al. explored the hypothesis that behavioral expressions of dominance in men increase men's sexual attractiveness to women. Across variations in background context, all four studies indicated an interaction between dominance and sex of target. Dominant behavior in men increased women's

sexual attraction to them; dominant behavior in women was not linked to sexual attraction in men. Male dominance enhanced only sexual attractiveness; it did not enhance general likability. Sadalla et al. noted that although there was nothing explicit in sociocultural theories of attraction that would have predicted these results, sociobiological theories would have. Specifically, Sadalla et al. asserted that "male dominance is an attribute whose genetic mechanism spread because it conferred a reproductive advantage to its carriers" (p. 737).

These accounts of social selectivity focus on competition and dominance as key attributes in males' attractiveness to females. But as theorists have noted, dominance is a complex construct, and its behavioral expression has different consequences depending on the social context (Bernstein, 1980; A. Buss, 1986, chapter 4; Hinde, 1978). There are alternatives—not necessarily incompatible with evolutionary accounts—that refocus on cooperation and altruism (Gould, 1988; Hinde, 1978). In an early critique of Spencerian interpretations of evolution, Kropotkin (1914) noted that the success of many species was attributable not to "survival of the fittest," but to an ability to organize into groups and engage in mutual aid. Trivers himself (1972) acknowledged that certain forms of cooperation (e.g., the ability to contribute to the care of offspring) may influence the choices of some females.

At a general theoretical level, cooperation and altruism can be conceptualized as social resources or, in Trivers's terms, "investments." That is, men who appear to be disposed to cooperate with their romantic partners, or who show nurturance and altruism, may be selectively preferred over other men. This preference may reflect not only the female's attribution that such males would be rewarding to her personally, but also that such males will be disposed to invest more heavily in their offspring (e.g., Ellis, 1992; Feingold, 1992; Graziano & Eisenberg, in press).

There are potential problems, however, in reconciling our theoretical conjectures with the outcomes of Sadalla et al.'s (1987) studies. Sadalla et al. appeared to demonstrate that sexual attraction is unrelated to general attraction or to positive male behaviors such as cooperation and altruism. Worse still, it is possible that women may derogate a cooperative, altruistic man for being a nonmasculine weakling (e.g., Daly & Wilson, 1988, p. 128).

A potential reconciliation can be found in research by Godfrey and Lowe (1975). These authors found that women made negative attributions to persons who incurred costs, but only when the persons were driven to do so by external circumstances. When costs were incurred as a result of intrinsic choice, attributions were positive. Extrapolating from these results, we refined our prediction: Men whose cooperation and altruism seem intrinsically motivated will be selectively preferred by women, whereas men whose cooperation appears to be externally motivated will not (cf. Hinde, 1978).

This line of reasoning may explain Sadalla et al.'s (1987) results. Male dominance may be seen as an expression of agentic behavior, in which the man actively makes choices and is effective in dealing with others (e.g., Wiggins, 1991). Without additional, qualifying information, male agentic behavior may be generally attractive to women. The agency-attraction relation may be moderated, however, by additional information

about the specific content of the agency. That is, men whose agency is linked to cooperative, altruistic tendencies should be preferred; men whose agency is linked to competitive, selfish tendencies should not. Male dominance may signal to women the ability to channel resources to her and her offspring, whereas altruism may signal the willingness to do so. A man who has resources but is unwilling to share them is probably not an attractive mate, at least for a long-term relationship (D. M. Buss, 1995; D. M. Buss & Schmitt, 1993).

We want to avoid simplistic interpretations, given that attraction is a complex, multifaceted process (Berscheid & Walster, 1978). Consequently, we used a multiple measurement methodology to probe effects of male dominance and prosocial orientation on different aspects of attraction, such as sexual attractiveness, dating desirability, physical attractiveness, and overall social desirability. For example, a prosocial man may be seen as socially desirable, but not more physically attractive or desirable as a date. Multiple measurement is especially important in probing hypotheses from evolutionary psychology in that dominance is presumed to affect some aspects of attraction, such as sexual attractiveness, but not necessarily others, such as general social desirability (Sadalla et al., 1987).

We conducted three interlocking, multimethod studies. All three studies manipulated the behavioral expression of male dominance and prosocial orientation. Women evaluated the men. We manipulated additional variables in the studies (e.g., male physical attractiveness; male or female targets of male dominance) to explore the reliability of effects across variations in context. We also collected data on personality variables relevant to interpersonal interaction to explore possible moderators of the relations among dominance, prosocial orientation, and attraction.

Given the theories outlined previously, we made the following general predictions. Overall, women's attraction to a man would be affected not only by the man's dominance but also by his prosocial orientation and physical appearance. More specifically, we hypothesized that women's subjective ratings of male physical attractiveness would be affected not only by male dominance (Sadalla et al., 1987), but also by male prosocial orientation. Second, we predicted that a man's prosocial orientation would increase his desirability as a date, his general social desirability, and his sexual attractiveness to women. This would be true, however, only if his prosocial orientation was seen as an individually initiated decision (i.e., emerging from dominance, not from submission to the demands of others).

Method

Participants

Female students ($N = 115$) enrolled in Introductory Psychology at Texas A&M University participated for partial fulfillment of their course requirements. Participants were randomly assigned to the cells of a 2 (dominance) × 2 (altruism) × 2 (physical attractiveness) between-subjects factorial design.

Stimulus Materials

Two male undergraduate confederates posed as naive participants. A makeup artist was employed to manipulate their physical attractiveness.

Two attractive and two unattractive head-and-shoulder Polaroid photographs were then taken of each confederate. The photographs were pretested for attractiveness. Two of the four were rated as relatively low in physical attractiveness ($M = 2.44$, $SD = 0.88$; $N = 9$) on a scale ranging from 1 (*not physically attractive*) to 10 (*very physically attractive*). The other two were rated as relatively high in physical attractiveness ($M = 6.78$; $SD = 1.48$; $N = 9$).

In addition, we constructed scripts to manipulate dominance and prosocial orientation in the confederate's behavior. All four scripts included a male confederate "research participant" who interacted with an "experimenter." Two additional male undergraduate confederates posed as experimenters. Experimenter–confederate pairings were completely counterbalanced across conditions. The scenario involved a discussion between an experimenter and a research participant.

Manipulations of dominance. We closely followed the manipulations used by Sadalla et al. (1987). We manipulated dominance with both nonverbal cues and overt actions. The body postures we used had been used by Sadalla et al. (1987), who had adapted them from Mehrabian (1969). In the high-dominance conditions, the confederate chose a chair close to the experimenter and sat relaxed with his legs crossed, leaning slightly back in his chair. The confederate's speech was loud, relatively rapid, and had few speech disturbances.

In the low-dominance conditions, the confederate chose the same chair as the high-dominance confederate but pushed the chair back to create some distance between himself and the experimenter. The confederate then leaned slightly forward with his hands clasped at his midsection and his head bowed. His legs were in a symmetrical position with both feet flat on the floor. The confederate's speech was soft, slower, and had more speech disfluencies.

Manipulations of prosocial orientation as altruism. For purposes of Study 1 we operationalized prosocial orientation as altruism. We defined altruism orientation as a willingness to incur costs for the benefit of others. In the high-altruism conditions, the confederate talked positively about giving others help. Then, in a concession to his yet-unseen partner's interests, he actively volunteered (high dominance) or acquiesced (low dominance) to the experimenter's suggestions to take the less attractive task of viewing a boring documentary. In the low-altruism conditions, the confederate talked about watching out only for himself. He then actively suggested (high dominance) or acquiesced (low dominance) to the experimenter's suggestions to choose the attractive task of viewing a recent comedy, leaving his partner with the boring documentary. The specific content of all conversations was virtually identical and was pretested for its effectiveness.

Procedure

Female participants arrived individually and were told that they were participating in a study on how women form initial impressions of men. We told each participant that she would be asked to form an impression of male research participant. She was told that he would not know that she was listening so that there would be a better chance of hearing the man's authentic, uncensored opinions. To enhance experimental realism, the exchange was presented as an overheard conversation.

We then told participants that this part of the experiment took less than 30 min, so they would have to participate in another brief study. We told them that the second study focused on how media induces mood and that their partner would be the male research participant, of whom they were forming an impression in the first study. We included the prospect of future interaction to make the stimulus person more salient and to encourage the participants to generate individuating impressions of the partner (Berscheid & Graziano, 1979; Graziano, Feldesman, & Rahe, 1985; Neuberg & Fiske, 1987).

Female participants then viewed the conversation, which was actually a prerecorded video interaction between a confederate research partici-

pant and a confederate experimenter. Each participant heard one of four conversations in which the male participant displayed either high or low levels of dominance and of altruistic concern.

After listening to the prerecorded conversation, female participants were given a photograph of the male research participant. Each participant was told that the photograph might "help her get a better look," because the hidden cameras were a bit out of focus. In fact, the video was purposefully misfocused slightly so we could use the photograph to manipulate the physical attractiveness of the confederate.

We then asked participants to rate the male confederate on various attributes using 5-point Likert-type scales. We used these scales to construct four summed composite dependent measures: physical attractiveness, dating desirability, social desirability, and external resources. The physical attractiveness measure consisted of four items (physically attractive, sexually attractive, sexy, beautiful) and had an internal consistency (Cronbach coefficient alpha) of .87. The dating desirability measure consisted of two items (desirable as a date, want as a partner) and had an internal consistency of .62. The social desirability measure, adapted from Dermer and Thiel (1975), consisted of 21 items (likable, kind, sensitive, intelligent, independent, considerate, assertive, modest, interesting, genuine, good, nice, pleasant, confident, strong, warm, exciting, sincere, concerned for others, good as a father, honest), with an internal consistency of .89. The external resource measure consisted of 2 items (likely to be rich, likely to have high income), with an internal consistency of .64.

We then asked participants to complete five personality inventories. We selected these inventories to probe the possible moderating effects of individual differences in women's perception of male behavior on women's attraction toward men. These inventories assessed sex roles, (Spence & Helmreich, 1978), spheres of control (Paulhus & Christie, 1981), emotional empathy (Mehrabian & Epstein, 1972), self-monitoring (Snyder, 1987), and dominance (A. Buss, 1986). Each participant was fully debriefed of the deception before the personality inventories because they took approximately 30 min to complete. If participants had not been debriefed at this point, then they might have become suspicious because of the supposed time constraint.

Results

Manipulation Checks

On a focused, single-item measure of dominance from 1 (*not at all dominant*) to 5 (*very dominant*), the high-dominance confederate was rated as significantly more dominant ($M = 3.48$) than his low-dominance counterpart ($M = 2.24$), $F(1, 107) = 54.52$, $p < .001$. On a single-item measure of altruism from 1 (*not at all altruistic*) to 5 (*very altruistic*), the high-altruism confederate was rated as significantly more altruistic ($M = 3.44$) than the low-altruism confederate ($M = 2.81$), $F(1, 107) = 11.08$, $p < .001$. On a single-item measure of physical attractiveness from 1 (*not at all physically attractive*) to 5 (*very physically attractive*), the physically attractive confederate was rated as more attractive ($M = 2.89$) than the physically unattractive confederate ($M = 2.57$), $F(1, 107) = 5.96$, $p < .02$.

Tests of Hypotheses

To control for Type I error rates, we first analyzed the four dependent measures using a 2 (dominance) $\times$ 2 (altruism) $\times$ 2 (physical attractiveness) multivariate analysis of variance (MANOVA) with the Pillai Trace as the test statistic (Olsen, 1976; Wilkinson, 1975).

We found a significant main effect of altruism, $F(4, 104) =$

3.40, $p < .01$. There was also a significant main effect for physical attractiveness, $F(4, 104) = 2.96$, $p < .02$. There was no significant main effect for dominance, $F(4, 104) = .83$, ns. There was no evidence for any multivariate interactions. Within these general multivariate patterns, we examined the empirical support for our more specific univariate hypotheses.

Physical attractiveness. We hypothesized that women's subjective ratings of a man's physical attractiveness would be affected not only by the man's dominance, but also by his prosocial orientation. To probe this hypothesis, we constructed a four-item scale that measured physical attractiveness. As predicted, the high altruistic confederate was rated as more physically attractive ($M = 2.53$, $SD = .68$) than the low altruistic confederate ($M = 2.21$, $SD = .71$), $F(1, 107) = 5.61$, $p < .02$. Means and standard deviations are presented in Table 1. There was no evidence, however, that male dominance was related to women's ratings of physical attractiveness, at least as measured by the four-item composite, $F(1, 107) = .12$, ns.

Sexual attractiveness. Sadalla et al. (1987) found that an important element in sexual attraction was a man's dominance. To provide a direct comparison of our findings to theirs, we also examined separately the results for the single item measuring sexual attractiveness outside of the four-item composite. There was no evidence that manipulated dominance had an effect on the ratings of sexual attractiveness, $F(1, 107) = .34$, ns. There was, however, evidence that altruism increased the sexual attractiveness of the confederate, $F(1, 107) = 4.82$, $p < .03$. Perhaps not surprisingly, the physically attractive confederate was also seen as more sexually attractive ($M = 2.20$) than the physically unattractive confederate ($M = 1.83$), $F(1, 107) = 4.23$, $p < .04$.

Social desirability. We hypothesized that a man's prosocial orientation would affect his perceived social desirability to women. Consistent with our hypothesis, the confederate who was altruistic toward his partner was seen as significantly more

desirable ($M = 3.48$, $SD = .46$) than the confederate who was nonaltruistic ($M = 3.16$, $SD = .53$), $F(1, 107) = 10.93$, $p < .001$. There was no evidence that the dominant confederate was seen as more socially desirable than his nondominant counterpart, $F(1, 107) = .06$, ns. Nor was there any evidence that the physically attractive confederate was seen as more socially desirable than his unattractive counterpart, $F(1, 107) = 1.12$, ns (cf. Graziano, Brothen, & Berscheid, 1978).

Dating desirability. Not surprisingly, the physically attractive confederate was seen as more desirable for a date than the physically unattractive confederate $F(1, 107) = 4.25$, $p < .05$. Consistent with our prediction, the high-altruistic confederate was also seen as more desirable as a date than the low-altruistic confederate, $F(1, 107) = 4.01$, $p < .05$. We did not replicate the finding of Sadalla et al. (1987) that dominance affected dating desirability, $F(1, 107) = .08$, ns.

External resources. From the perspective of Trivers's (1972) model, women prefer men with traits that signal their capacity to contribute external resources to their offspring. We probed this hypothesis with a two-item scale that measured the confederate's perceived potential for wealth. We found that physically attractive men were predicted to have more potential for wealth ($M = 3.08$, $SD = .64$) than were physically unattractive men ($M = 2.78$, $SD = .48$), $F(1, 107) = 8.01$, $p < .01$. There was no evidence that either dominance, $F(1, 107) = 1.80$, ns, or altruism, $F(1, 107) = .31$, ns, influenced the confederate's predicted external resources.

Mediational analyses using structural equations. Our initial analyses demonstrated the effectiveness of the manipulations in producing the desired effects on the manipulation checks of dominance, altruism, and physical attractiveness. However, our manipulation checks also indicated that there was some cross influence of our manipulations. Of particular note was a significant Dominance × Altruism interaction on the altruism manipulation check, $F(1, 107) = 6.25$, $p < .01$. This

Table 1
Study 1—Mean Ratings for Attraction Measures

	Stimulus condition							
	Physically attractive				Physically unattractive			
Dependent measures	Nondominant nonaltruistic	Nondominant altruistic	Dominant nonaltruistic	Dominant altruistic	Nondominant nonaltruistic	Nondominant altruistic	Dominant nonaltruistic	Dominant altruistic
N	11	16	13	15	13	19	15	13
Physical attractiveness								
M	2.64	2.73	2.38	2.53	1.92	2.34	2.00	2.54
SD	0.75	0.60	0.85	0.72	0.44	0.83	0.59	0.39
Sexual attractiveness								
M	2.18	2.50	1.92	2.13	1.54	2.00	1.60	2.15
SD	0.98	0.89	1.04	0.99	0.88	1.00	0.91	0.69
Social desirability								
M	3.33	3.40	3.13	3.63	3.07	3.45	3.14	3.44
SD	0.53	0.41	0.63	0.51	0.49	0.54	0.50	0.32
Dating desirability								
M	2.91	2.78	2.46	3.07	2.23	2.74	2.33	2.61
SD	0.80	0.84	1.03	0.84	0.73	1.07	0.70	0.36
External resources								
M	3.05	3.06	3.15	3.07	2.54	2.79	2.87	2.92
SD	0.57	0.48	0.90	0.62	0.43	0.45	0.64	0.28

cross influence raised potential problems for the interpretation of the independent variables.

To address this potential problem, we conducted a series of structural equation analyses. The structural equation analyses allowed us to partition the relative impact of correlated predictors on the criterion. We treated the manipulation checks as mediating variables between the manipulations and the dependent variables. In effect, the manipulation checks served as proxy measures of each participant's phenomenology, which was presumed to be the subjective proximal mediator of the impact of the objective manipulations (see Figure 1).

Reflecting the suggestions of Baron and Kenny (1986), our first structural model jointly examined the effects of the manipulations of dominance, altruism, attractiveness, and the Dominance × Altruism interaction on the three manipulation checks (see West, Aiken, & Todd, in press). For each of the three manipulation checks, the largest amount of predictive variance was attributable to the appropriate manipulation, with no impact or smaller impact from other manipulations. For the dominance manipulation check, the only significant predictor was the dominance manipulation ($z = 7.62$, $p < .001$). For the altruism manipulation check, the largest portion of the variance was attributable to the altruism manipulation ($z = 3.37$, $p < .001$), with a smaller contribution from the Altruism × Dominance cross product ($p < .01$). For the physical attractiveness manipulation check, the largest predictive variance was attributable to the physical attractiveness manipulation ($z = 2.45$), with a smaller contribution from the altruism manipulation ($z = 2.13$). The effect of the dominance manipulation on this manipulation check did not approach statistical significance.

Using the EQS 3 program (Bentler, 1989), we then separately estimated a series of structural equation models for each outcome measure to test the hypotheses that the effects of the manipulations on each of the dependent measures were mediated by the manipulation checks (West et al., in press). Using weighted effect codes (Darlington, 1990), we formed contrast terms corresponding to each of the three manipulations, the three 2-way, and one 3-way interactions. An initial no-mediation (common cause) model specified paths from the contrast terms representing the three manipulations and the Altruism × Dominance interaction to the three mediators and from all seven contrast terms to the outcome measure under consideration. The full mediational model additionally specified paths from each of the three mediators to the outcome variable.

None of the no-mediation models had an adequate fit to the data, whereas each of full mediational models fit the data (all ps were nonsignificant). Chi-square difference tests (Bentler & Bonett, 1980) showed that significant overall mediation occurred for physical attractiveness, difference $\chi^2(3, N = 115) = 170.50$; sexual attractiveness, difference $\chi^2(3, N = 115) = 56.00$; social desirability, difference $\chi^2(3, N = 115) = 47.30$; dating desirability, difference $\chi^2(3, N = 115) = 24.10$; and external resources, difference $\chi^2(3, N = 115) = 37.00$; all ps < .001. The path from the physical attractiveness manipulation check to the outcome variable was significant in each of the five models corresponding to each of the outcome variables: physical attractiveness ($z = 20.2$); sexual attractiveness ($z = 8.62$); social desirability ($z = 4.78$); dating desirability ($z = 7.75$); and external resources ($z = 6.63$). Only one other path from a

manipulation check to an outcome even approached significance: altruism to social desirability ($z = 1.78$, $p < .10$). Recall that in the first step in the mediational chain, manipulations of both altruism and physical attractiveness influenced women's judgments of men's physical attractiveness on the manipulation check.

These mediational analyses are complex and do not provide the final word. The analyses suggest, however, that it is reasonable to believe that our manipulations were generally successful and the effects partitionable. The analyses also suggest the potential importance of judgments of physical attractiveness in each of the observed outcomes. The cross influence of manipulations was probably not fatal in probing our hypotheses about the impact of men's altruistic and prosocial tendencies in their attractiveness to women.

Personality Variables

Finally, there was no evidence that any of the personality measures used in this study were related to female attraction or interacted with the independent variables to moderate effects.

Study 2

In Study 1, we found that a man's physical attractiveness and prosocial orientation influenced women's attraction to him. Surprisingly, we did not find any systematic effect of dominance. There are, however, several potential limitations to Study 1. First, we may not have found dominance effects because the interaction took place between an experimenter and a research participant. The researcher's legitimate authority may have attenuated the effects of the portrayed dominance. No matter how dominant the participant might have been, ultimately the experimenter was in control. Furthermore, both the research participant and the experimenter were men. For female observers, male dominance expressed toward another man probably conveys a meaning different from phenotypically similar male dominance expressed toward a woman. Sadalla et al. (1987) expressed no reservations about the generality of the impact of male dominance, leaving the implication that the target of dominant behavior is unimportant. We specifically sought to explore the generality of male dominance effects across sex of target.

Second, we may have biased results against dominance effects by simultaneously using a highly salient manipulation of altruism. In Study 1, the female participants received direct, personal benefits from their altruistic male partners. Had the prosocial behavior been less personal, dominant behavior may have been more important in the women's evaluations. Furthermore, generalized altruistic impulses in men may be less attractive to women than prosocial behavior targeted specifically to them (e.g., Godfrey & Lowe, 1975). Finally, a more generalized form of prosocial behavior may be easier to manipulate independently of dominance. Ideally, the more generalized form of prosocial behavior would generate fewer potential problems of cross influence. In Study 2 we manipulated male prosocial orientation as agreeableness (Graziano & Eisenberg, in press) instead of altruism.

To probe the generality of findings from Study 1, we created

a situation in which the female participants were not personal targets, nor would they benefit directly from their male partner's prosocial orientation. Finally, some of our measures in Study 1 were based on a small number of items; such measures are often unreliable. Study 2 used multiple-item composite measures that would be expected to have improved reliability.

Method

Research Participants

Female students (N = 159) enrolled in psychology courses at Texas A&M University participated for partial fulfillment of their course requirements. The participants were randomly assigned to the cells of a 2 (dominance) × 2 (agreeableness) × 2 (sex of jury partner) between-subjects factorial design.

Stimulus Materials

We constructed scripts to manipulate dominance and agreeableness. Each script involved three confederates. One confederate portrayed an experimenter, and the other two portrayed research participants. The participant's task was to evaluate one of the two research participants (we call this person the target). For half of the participants, the two research participants they saw were male. For the other half of the participants, one research participant was female and the other was male. The target was always a male research participant. Thus female participants evaluated a male research participant target when his supposed partner was either another man or a woman. To avoid confounds, we used two different men as targets, two different women and men as partners, and two different women as experimenters. Persons were completely counterbalanced across conditions and presented in the same video format as in Study 1. Again, the videos were slightly unfocused to make the physical attractiveness of the stimulus persons more ambiguous.

The videos presented two research participants involved in a study on jury decisions. More specifically, the experimenter explained her jury study and then left the two participants alone to deliberate the case. Within this context, the target person portrayed high or low levels of dominance and of agreeableness.

Manipulations of Target's Behavior

The same body postures used to manipulate dominance in Study 1 were used. Within the constrains of credibility, normal variations in agreeableness were also manipulated. We used Goldberg's (1992) marker adjectives to frame the manipulation. In the high-agreeableness conditions, the man solicited the opinions of his partner, was sympathetic to the perspectives of the partner, and was warm. In the low-agreeableness conditions, without being hostile or antisocial, the man criticized the opinions of his partner, was insensitive to his or her perspective, and was not especially warm.

The substantive content of the conversations was virtually identical, within the constraints of the specific manipulations. The two-person jury (i.e., target stimulus person and partner) always reached the same decision, despite the condition. Again, the tapes were pretested for the effectiveness of the manipulations.

Procedure

The procedures were very similar to those in Study 1, with three exceptions. First, participants were told that they would be participating in a study on jury decisions rather than on media and mood. Second, the conversation on the tape involved two cooriented peer research par-

ticipants. The female participant saw one of four conversations in which the male target person displayed either high or low levels of dominant and of agreeable behaviors toward a male or female partner. The female participant then rated him on four composite measures based on summed Likert-type scales.

The social desirability measure remained the same as in Study 1. In Study 2, the internal consistency (Cronbach coefficient alpha) was .91 as compared to .89 for this composite in Study 1. Items were added to the other three measures to increase their reliability. Dating desirability was expanded to include five items. The items included how much the research participant would be willing to accept the man as a partner for the jury study, romantic or date partner, dance partner, date for a formal activity, or a casual date. The internal consistency of the scale increased to .87. We also expanded our resources scale to five items, which included "will have a high paying job," "successful," "high income," "very wealthy," and "likely to end up rich." The internal consistency of this scale increased to .86. The physical attractiveness composite was slightly altered. Beauty was dropped because female participants in Study 1 found "beautiful" an inappropriate descriptor of male attractiveness. The descriptors "cute," "good looking," and "handsome" were added. The internal consistency was .94, compared to .87 for this composite in Study 1.

The last difference involved different personality inventories from those used in Study 1. The inventories in Study 2 included the Spence-Helmreich Sex-Role Inventory (Spence & Helmreich, 1978), the Paulhus Spheres of Control (Paulhus & Christie, 1981), and a measure of each of the Big Five personality traits (Digman & Inouye, 1986).

Results

Manipulation Checks

Using a single-item scale from 1 (*not at all dominant*) to 5 (*very dominant*), the high-dominance confederate was seen as more dominant (M = 4.43) than the low-dominance confederate (M = 2.70), $F(1, 151)$ = 131.16, $p < .001$. Using a single-item scale from 1 (*not at all agreeable*) to 5 (*very agreeable*), the high-agreeableness confederate was seen as more agreeable (M = 3.31) than the low-agreeableness confederate (M = 1.91), $F(1, 151)$ = 100.18, $p < .001$. Thus, our manipulations were effective.

Tests of Hypotheses

As in Study 1, our initial analyses used MANOVA to control for Type I error rates. We used a 2 (dominance) × 2 (agreeableness) × 2 (sex of partner) multivariate, between-subjects factorial design, with Pillai's trace as the test statistic (Olsen, 1976; Wilkinson, 1975).

We found a significant main effect for agreeableness, $F(4, 148)$ = 19.11, $p < .001$. There was also a significant main effect for dominance, $F(4, 148)$ = 6.04, $p < .001$. There was no significant main effect for sex of partner, $F(4, 148)$ = .98, *ns.* There was also a multivariate Dominance × Agreeableness interaction, $F(4, 148)$ = 6.20, $p < .001$. Within these general multivariate patterns, we examined univariate empirical support for our specific hypotheses. We conducted post hoc simple effect analyses using procedures described by Winer, Brown, and Michels (1991).

We hypothesized that a man's agreeable behavior would moderate the effects of his dominance in women's attraction to him. To evaluate this hypothesis more specifically, we con-

ducted univariate analyses on each of the attraction-relevant dependent measures separately.

Physical attractiveness. As predicted, main effects were qualified by a significant Dominance × Agreeableness interaction, $F(1, 151) = 5.34$, $p < .02$. Simple effects analysis of this interaction found no evidence that dominance had an effect on rated physical attractiveness for low-agreeable men ($Ms = 2.54$ and 2.40 for low and high dominance, respectively, $t = .73$, ns). For high-agreeable men, however, dominance enhanced their physical attractiveness significantly ($t = 4.05$, $p < .05$). The dominant–agreeable confederate was seen as the most physically attractive of the four male prototypes (See Table 2).

Sexual attractiveness. There was a significant Dominance × Agreeableness interaction, $F(1, 151) = 5.35$, $p < .02$. Outcomes ran closely parallel to those for physical attractiveness. Again, there was no evidence that dominance had an effect on rated sexual attractiveness for low-agreeable men ($Ms = 2.08$ and 2.27, for low and high dominance, respectively, $t = .47$, ns). For high-agreeable men, however, high dominance enhanced sexual attractiveness over low dominance significantly ($t = 4.03$, $p < .05$). The dominant–agreeable confederate was seen as the most sexually attractive of the four male prototypes (see Table 2).

Social desirability. Main effects for both dominance and agreeableness were qualified by a significant Dominant × Agreeableness interaction, $F(1, 151) = 22.33$, $p < .001$. Simple effects analysis of this interaction found no evidence that dominance had an effect on rated social desirability for low-agreeable men ($t = 1.75$, ns; $Ms = 2.79$ and 2.58 for low and high dominance, respectively). If anything, simple means imply that dominance decreases social desirability. For high-agreeable men, however, dominance enhanced their desirability significantly ($t = 5.25$, $p < .05$). The dominant–agreeable confederate was seen as the most socially desirable of the four male prototypes (see Table 2).

Dating desirability. Again, there was a Dominance ×

Agreeableness interaction, $F(1, 151) = 18.00$, $p < .001$. Simple effects analysis of this interaction found no evidence that dominance had an effect of on rated dating desirability for low-agreeable men ($t = .60$, ns, $Ms = 1.93$ and 1.81 for low and high dominance, respectively). If anything, simple means imply that dominance decreased dating desirability. For high-agreeable men, however, dominance enhanced their desirability as a date significantly ($t = 5.45$, $p < .05$). The dominant–agreeable confederate was seen as the most desirable as a date of the four male prototypes (see Table 2).

External resources. We again probed the hypothesis that women's judgments of a man's external resources may be influenced by the man's social behavior. There was a significant Dominance × Agreeableness interaction, $F(1, 151) = 7.31$, $p < .01$. Simple effects analysis of this interaction found no evidence that dominance had an effect on rated wealth for low-agreeable men ($t = 1.21$, ns; $Ms = 2.82$ and 2.99 for low and high dominance, respectively). For high-agreeable men, however, dominance enhanced their expected wealth significantly ($t = 4.93$, $p < .05$). The dominant–agreeable confederate was seen as the most potentially wealthy person of the four male prototypes (see Table 2).

Mediational analyses using structural equations. As in Study 1, there were some apparent cross influences of the manipulations. In addition to the main effect of dominance, agreeableness also had a main effect on the dominance manipulation check, $F(1, 151) = 45.55$, $p < .001$. The low-agreeable confederate was seen as more dominant ($M = 4.09$, $SD = 1.22$) than the high-agreeable confederate ($M = 3.10$, $SD = 1.39$). Besides the significant main effect for agreeableness, there was also a significant Dominance × Agreeableness interaction on the agreeableness manipulation check, $F(1, 151) = 15.40$, $p < .001$. The dominant–disagreeable person ($M = 1.57$, $SD = .74$) was seen as less agreeable than the nondominant–disagreeable person ($M = 2.28$, $SD = .93$), $t(151) = 3.74$, $p < .05$. There was no evidence, however, that the dominant–agreeable person

Table 2
Study 2—Mean Ratings for Attraction Measures

Dependent measures	Stimulus condition			
	Nondominant nonprosocial	Nondominant prosocial	Dominant nonprosocial	Dominant prosocial
N	40	36	41	42
Physical attractiveness				
M	2.40	2.33	2.54	3.10
SD	0.75	0.66	0.96	0.98
Sexual attractiveness				
M	2.08	1.94	2.27	2.90
SD	1.00	0.79	1.16	1.14
Social desirability				
M	2.79	3.03	2.58	3.65
SD	0.54	0.53	0.57	0.57
Dating desirability				
M	1.93	1.95	1.81	3.04
SD	0.86	0.75	0.92	1.02
External resources				
M	2.82	2.68	2.99	3.37
SD	0.51	0.63	0.70	0.59

(M = 3.48, SD = .83) was seen as more agreeable than the nondominant–agreeable person (M = 3.11, SD = .95), $t(151)$ = 1.85, ns.

As an aid in untangling these findings, we again conducted a series of structural equation analyses following the general procedures outlined in Study 1. Sex of partner did not influence any manipulation check or dependent variable, hence we dropped it from all analyses. The first structural model jointly examined the effects of the manipulations of dominance, agreeableness, and the Dominance × Altruism interaction on the two manipulation checks (Aiken & West, 1991). Again, for each manipulation check, the largest predictive variance was attributable to the appropriate manipulation.

We then separately estimated a series of structural equation models for each outcome measure to test the hypotheses that the effects of the manipulations on each of our dependent measures were mediated by the manipulation checks. Contrast terms were formed corresponding to each of the two manipulations and their interaction. The initial no-mediation (common cause) model specified paths from the contrast terms representing the two manipulations and their interaction to the two mediators and from the contrast terms to the outcome measure under consideration. The full mediational model additionally specified paths from each of the two mediators to the outcome variable. Again, each of the no-mediation models failed to provide an adequate fit to the data; each of the full mediational models was just identified, and by definition fit the data perfectly (p = 1.00). Chi-square difference tests (Bentler & Bonett, 1980) showed significant overall mediation occurred for physical attractiveness, difference $\chi^2(2, N = 159)$ = 16.90; sexual attractiveness, difference $\chi^2(2, N = 159)$ = 14.60; social desirability, $\chi^2(2, N = 159)$ = 54.30, dating desirability, difference $\chi^2(2, N = 159)$ = 46.60; and external resources, $\chi^2(2, N = 159)$ = 18.20; all $ps < .001$. The path from the agreeableness manipulation check to the outcome variable was significant in each of the five models corresponding to each of these outcome variables: physical attractiveness (z = 4.22); sexual attractiveness (z = 3.91); social desirability (z = 7.79); dating desirability (z = 7.54); and external resources (z = 3.92; all $ps < .001$). The path from the dominance manipulation check to the outcome variable was significant for social desirability (z = 3.12); and external resources (z = 2.53). Of interest, the dominance manipulation also had significant direct (nonmediated) effects on physical attractiveness (z = 4.26); sexual attractiveness (z = 2.58); dating desirability (z = 2.46); and external resources (z = 1.99; all $ps < .05$).

Once again, the mediational structural equation analyses showed that the largest predictive variance was attributable to the appropriate manipulation. Across all of the outcome variables, the mediational model provided a better fit to the data than the no-mediation model. Of interest, the agreeableness manipulation check appeared to serve as a mediator of the effects of the manipulations for all outcome variables. In contrast, the effects of the dominance manipulation were more consistent with a direct, nonmediated model for the dependent variables of physical attractiveness, sexual attractiveness, and dating desirability. Although caution must be used in interpreting these results, they suggest that participants' cognitive aware-

ness may play less of a role in the influence of dominance than in the influence of agreeableness on measures of attraction.

Personality Variables

Finally, as in Study 1, none of the personality measures used in Study 2 were related to female attraction or interacted significantly with independent variables in moderated effects.

Study 3

In Studies 1 and 2 we found converging effects for the impact on women's attraction to men of a class of prosocial behaviors we labeled altruism and agreeableness. Furthermore, in Study 2 we found that the impact of dominance on attraction appears to be moderated by levels of agreeableness. There are, however, potential limitations in interpreting Studies 1 and 2. First, these studies are mute about sex differences because we collected data from women only. We do not know whether our results would be similar for men's attraction to women. Second, D. M. Buss and Schmitt (1993) and Kenrick, Sadalla, Groth, and Trost (1990) have argued that the desirability of the person is moderated by the length of perspective that an observer takes on the relationship. Candidates for long relationships (e.g., marriage) probably require attributes different from candidates for short-term commitments (e.g., a date). Consequently, it may be important to collect information on the perceiver's time perspective in evaluating another person's attractiveness and desirability as a partner for social relationships. Third, there may have been unique or idiosyncratic method variance in our scripts and videos that somehow biased the results against dominance. Similarly, the video scripts may have contributed in some unknown way to the cross influence in the manipulation checks. That is, if all manipulations share a common vehicle of expression, then cross influence may be largely a result of method variance associated with the vehicle.

We designed Study 3 to probe both men's and women's attraction to members of the opposite sex within the theoretical framework of the five-factor model of personality (Digman, 1990; Goldberg, 1992). In the five-factor model, surgency–dominance and agreeableness seem to be two very important dimensions of interpersonal evaluation (McCrae & John, 1992; Wiggins, 1991). Goldberg constructed standard sets of verbal markers of these five factors so that his factors would be orthogonal and presented data showing that Factor 1 (Surgency) and Factor 2 (Agreeableness) formed from his adjectives were in fact not significantly correlated (r = .05, ns, raw scores; r = .06, ns, z scores; see Goldberg, 1992, p. 37). Goldberg's adjectives provided us with a tool for probing our basic hypotheses, using relatively independent, nonvideo, verbal, univocal markers of dominance and agreeableness.

Given the findings of Studies 1 and 2, we revised our original theorizing slightly and advanced the following predictions for Study 3. First, we hypothesized that women's subjective ratings of a man's physical attractiveness would be affected not only by dominance (Sadalla et al., 1987), but also by the man's prosocial and agreeableness orientation. Given the data from Studies 1 and 2, agreeableness may even overshadow dominance in women's judgments of men's attractiveness. More specifically,
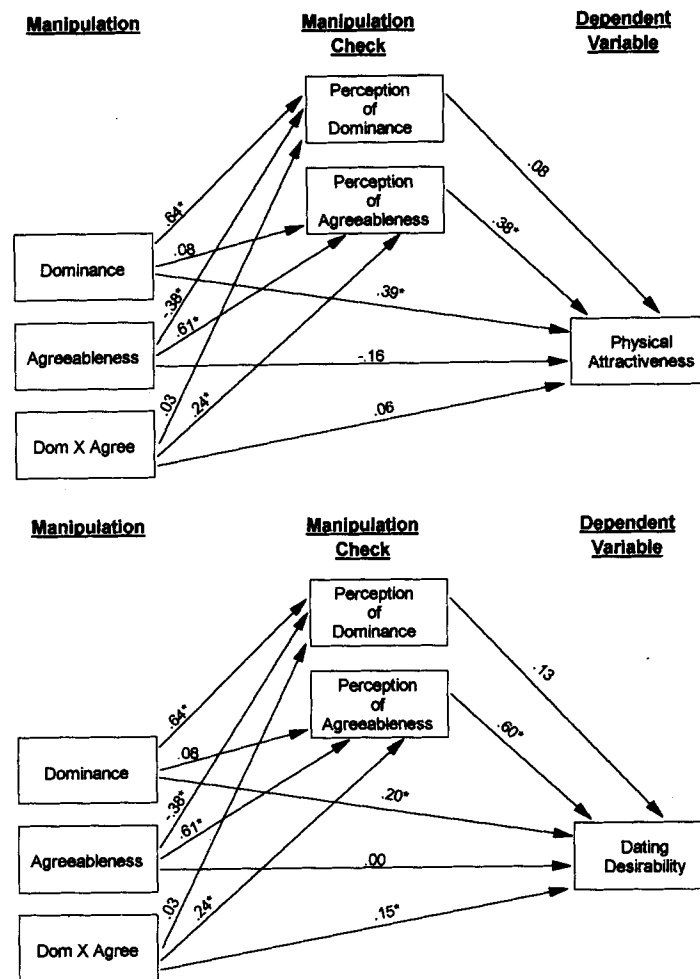
Figure 1. Illustration of mediational analyses. Also estimated in the model but not depicted in the figure were correlations between exogenous variables: agreeableness manipulation with dominance manipulation, $r = .03$; agreeableness manipulation with Agree $\times$ Dom interaction, $r = .00$; dominance manipulation with Agree $\times$ Dom interaction, $r = .00$; and between the residuals of the agreeableness and dominance manipulation checks, $r = .14$. $*p < .05$.

we predicted that a man's agreeableness would be related to increased desirability as a date, general social desirability, and sexual attractiveness to women. We also collected a length-of-perspective measure of attraction to probe the possibility that agreeableness in a prospective partner may become more valuable as the length of anticipated relationship increases (D. M. Buss & Schmitt, 1993).

Method

Research Participants

A total of 74 Texas A&M University students (27 men; 47 women) enrolled in upper level psychology courses participated for partial fulfillment of their course requirements. The participants were randomly assigned to the cells of a 2 (dominance) $\times$ 2 (agreeableness) $\times$ 2 (sex of participant) between-subjects factorial design.

Stimulus Materials

To frame the manipulations, we selected words from Goldberg's (1992) marker adjectives from Factors 1 (Surgency) and 2 (Agreeableness) of the five-factor model of personality (see Digman, 1990; McCrae & John, 1992). The five-factor model has its origins in natural language and has received extensive evaluation. Goldberg has demonstrated clear factors for surgency and agreeableness.

We created four distinct targets with a 2 (dominance) $\times$ 2 (agreeableness) factorial. The dominant and nondominant targets were framed in terms of surgency (Factor 1). The dominant individual was described as active, assertive, bold, talkative, and verbal. The nondominant confederate was described as introverted, quiet, reserved, timid, and untalkative. The agreeable and disagreeable targets were framed in terms of agreeableness (Factor 2). The agreeable person was described as considerate, cooperative, generous, kind, and sympathetic. The disagreeable confederate was described as rude, selfish, uncooperative, unkind, and unsympathetic.

Procedure

Research participants were tested in one of two sessions. The participants were randomly assigned to one of the four conditions as they arrived. Once all participants were in the room, they were told that people form impressions from very limited information. They were then told to look at a list of words that described one of the four target persons. They were told to read the words carefully and imagine that the words described a member of the opposite sex. They were then told to try to form an image of the person. The experimenter then told everyone to turn the page over and to rate the person on various dimensions using Likert-type scales. They were not permitted to look back at the individual words once they began giving their impressions.

The dependent measures remained the same as in Study 2 with two exceptions. First, a new two-item scale measuring long-term desirability was created. The items were "desirable as a marriage partner" and "desirable for a long-term relationship." The alpha for this new scale was .97. Second, the social desirability scale was reduced to 19 items. "Assertive" and "kind" were removed from the scale because they were part of our verbal manipulations. For Study 3, the alphas for social desirability, dating desirability, physical attractiveness, and external resources were .87, .90, .93, and .92, respectively.

Results

Manipulations Checks

Using a single-item scale from 1 (*not at all dominant*) to 9 (*very dominant*), the high-dominant target was seen as more dominant ($M = 7.27$) than the low-dominant target ($M = 3.35$), $F(1, 66) = 97.18$, $p < .001$. Using a single-item scale from 1 (*not at all agreeable*) to 9 (*very agreeable*), the high-agreeable target persons were seen as more agreeable ($M = 7.76$) than the low-agreeable target persons ($M = 2.27$), $F(1, 66) = 180.93$, $p < .001$. The low-agreeable targets were also seen as more dominant ($M = 6.38$) than the high-agreeable targets ($M = 4.24$), $F(1, 66) = 29.35$, $p < .001$.[1]

Tests of Hypotheses

To control for Type I error rates, we first analyzed data for the five dependent measures using a 2 (dominance) × 2 (agreeableness) × 2 (sex of rater) MANOVA, with the test statistic being Pillai's trace (Olsen, 1976; Wilkinson, 1975). Simple effects analyses following univariate analyses used the same procedure as in Studies 1 and 2.

We found a significant multivariate main effect for agreeableness, $F(5, 62) = 60.21$, $p < .001$. There were also significant multivariate main effects for dominance, $F(5, 62) = 5.12$, $p < .001$, and for sex of participant, $F(5, 62) = 4.78$, $p < .001$. These multivariate main effects were qualified by a multivariate Dominance × Agreeableness interaction, $F(5, 62) = 2.33$, $p < .05$. Within these general multivariate patterns, we examined the univariate empirical support for our specific hypotheses. In particular, we hypothesized that a person's agreeable behavior would moderate the effects of dominance in the opposite sex person's attraction to him or her.

Physical attractiveness. As predicted, the high-agreeable targets were perceived as more physically attractive ($M = 6.31$) than were the low-agreeableness targets ($M = 4.55$),

$F(1, 66) = 17.74$, $p < .001$ (see Table 3). Consistent with Sadalla et al.'s (1987) findings, we also found that main effects for dominance were qualified by a significant Dominance × Sex interaction, $F(1, 66) = 4.07$, $p < .05$ (see Figure 2). Simple effects analysis of this interaction found that female participants evaluated the dominant male target as more physically attractive ($M = 6.67$) than the nondominant male target ($M = 3.78$, $t = 6.42$, $p < .05$). There was no evidence that male participants found the dominant female target to be more attractive than the nondominant targets ($Ms = 6.10$ and 5.56, respectively; $t = .88$, ns).

Sexual attractiveness. As predicted, the high-agreeable targets were perceived as more sexually attractive ($M = 6.00$) than were the low-agreeable targets ($M = 4.65$), $F(1, 66) = 6.30$, $p < .01$ (see Table 2). There was a main effect for dominance, but it was qualified by a significant Dominance × Sex interaction, $F(1, 66) = 4.40$, $p < .04$ (see Figure 2). Simple effects analysis indicated that female participants found the dominant male target ($M = 6.78$) more sexually attractive than the nondominant male target ($M = 3.50$), $t = 6.56$, $p < .05$. There was no evidence that male participants found the dominant female targets to be more sexually attractive than the nondominant female targets ($Ms = 6.14$, 5.23, respectively; $t = 1.38$, ns.). On this dependent measure, there was no significant Dominance × Agreeableness interaction, $F(1, 66) = .52$, ns.

Social desirability. The high-agreeable targets were seen as more socially desirable ($M = 7.23$) than the low-agreeable targets ($M = 3.87$), $F(1, 66) = 225.14$, $p < .001$. The agreeableness main effect was qualified by an Agreeableness × Sex interaction. Simple effects analysis of this interaction found that the low-agreeableness targets were seen as less socially desirable by female participants ($M = 3.34$) than by male participants ($M = 4.57$), $t = 4.39$, $p < .05$. The high-agreeable targets were seen as equally attractive for men and women ($Ms = 7.25$, 7.19, $t = .19$, ns). The dominant targets were seen as marginally more desirable ($M = 5.91$) than the nondominant targets ($M = 5.19$), $F(1, 66) = 3.58$, $p < .06$.

Dating desirability. As predicted, main effects for dominance and agreeableness were qualified by a significant Sex × Dominance × Agreeableness interaction, $F(1, 66) = 4.64$, $p < .03$ (see Figure 3). To clarify the meaning of the three-factor interaction, we analyzed data separately for men and women, using 2 (dominance) × 2 (agreeableness) ANOVAs. For male participants, there was no significant difference in attraction to female targets with different levels of dominance ($Ms = 5.05$

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[1] As in Studies 1 and 2, there were some apparent cross influences of the dominance and agreeableness manipulations. Contrast terms were formed representing the dominance and agreeableness manipulations, participant sex, and the Dominance × Agreeableness interaction. Again, for each manipulation check, the largest amount of predictive variance was attributable to the appropriate manipulation, with no impact or smaller impact from the other manipulations. Using the same procedures as in Study 1, the full mediational models were estimated using EQS. Reflecting the decreased sample size ($N = 74$) and hence lower power in Study 3, most of the chi-square difference tests were not significant: physical attractiveness, $\chi^2(2) = 5.20$, $p < .10$; sexual attractiveness, $\chi^2(2) = 2.30$, ns; social desirability, $\chi^2(2) = 26.00$, $p < .001$; dating desirability, $\chi^2(2) = 4.10$, ns; and external resources, $\chi^2(2) = 4.00$, ns.

Table 3
Study 3—Mean Ratings for Attraction Measures

	Stimulus condition							
	Female participants				Male participants			
Dependent measures	Nondominant disagreeable	Nondominant agreeable	Dominant disagreeable	Dominant agreeable	Nondominant disagreeable	Nondominant agreeable	Dominant disagreeable	Dominant agreeable
N	13	11	8	15	6	7	10	4
Physical attractiveness								
M	3.04	4.65	5.58	7.26	4.81	6.21	5.55	7.46
SD	1.44	1.43	1.3	1.18	1.18	1.85	2.43	0.80
Sexual attractiveness								
M	2.85	4.27	5.75	7.33	5.17	5.28	5.80	7.00
SD	1.28	1.95	1.28	1.11	1.33	2.06	2.66	1.63
Social desirability								
M	3.14	6.76	3.66	7.61	4.47	7.16	4.62	7.25
SD	0.84	0.79	0.68	0.59	0.75	0.48	1.49	0.51
Dating desirability								
M	1.77	4.56	2.10	7.81	2.93	6.86	4.22	7.45
SD	1.79	2.31	1.54	0.80	1.58	1.56	1.97	0.85
External resources								
M	5.15	5.27	6.42	7.51	5.40	5.29	6.06	6.35
SD	2.07	1.22	1.19	0.96	0.98	1.87	1.65	1.37
Long-term commitment								
M	1.31	5.41	1.13	7.73	3.58	6.71	3.10	8.13
SD	0.85	1.97	0.35	1.00	2.11	2.45	1.96	1.03

and 5.14). Levels of agreeableness, however, did affect men's ratings of dating desirability (Ms = 3.74 and 7.07 for low and high agreeableness respectively). For women, we found the predicted Dominance × Agreeableness interaction, $F(1, 43)$ = 8.65, $p < .005$. For high-agreeableness male targets, dominance enhanced their dating desirability (Ms = 4.56 and 7.81 for low and high dominance, respectively). There was no evidence that dominance had an effect on rated dating desirability for low-agreeableness targets (Ms = 1.77 and 2.10 for low and high dominance, respectively).

Long-term desirability. On our measure of the desirability for a long-term relationship, we found a significant Dominance × Agreeableness interaction, $F(1, 66)$ = 7.93, $p < .001$. Simple effects analysis of this interaction found that for high-agreeableness targets, dominance enhanced their long-term desirability (Ms = 5.92 and 7.82 for low and high dominance, respectively, t = 3.73, $p < .05$). There was no evidence that dominance had any enhancing effect in the evaluation of low-agreeableness targets (t = 1.76, ns).

External resources. We again probed the hypothesis that women's judgments of a man's external resources may be influenced by the man's social behavior. The dominant target was seen as potentially more wealthy (M = 6.76) than the nondominant target (M = 5.25), $F(1, 66)$ = 12.22, $p < .001$. This pattern held, however, for both male and female targets. There was no evidence of an agreeableness main effect, $F(1, 66)$ = .85, ns, nor a significant Dominance × Agreeableness interaction on this specific dependent variable, $F(1, 66)$ = .84, ns.

Discussion

Three interlocking studies probed hypotheses derived from evolutionary psychology about women's attraction to men. Past

theory and research has focused on the evolutionary importance of male dominance and the attractiveness of male dominance to women. More specifically, we probed the hypothesis that women's reactions to men's dominance would be moderated by the man's prosocial orientation.

In Study 1, we found that altruistic men were rated as more physically attractive, more sexually attractive, more socially desirable, and more desirable as a date, relative to nonaltruistic men. Given past theory and research (Sadalla et al., 1987), we were surprised to find no evidence that dominant men were systematically more attractive to women than were low-dominance men, nor any evidence that male dominance interacted with male altruism in eliciting attraction from women. Our manipulation check data and structural equation analyses suggest that our inability to detect effects of dominance on attraction is probably not an artifact of weak dominance manipulations. Nor does it appear to be an artifact of the inability of the female participants to recognize various combinations of dominance and altruism.

In Study 2, we probed hypotheses that results from Study 1 were procedural artifacts. In Study 1, the manipulation of altruism was immediate and personal. Furthermore, the dominance manipulation occurred simultaneously with manipulations of physical attractiveness. It was possible that these two variables were more salient than the behavioral expression of dominance and that they overwhelmed its influence.

In Study 2, we altered procedures to manipulate a less personalized form of prosocial orientation and to eliminate the very salient variable of physical attractiveness. Results suggested that women's attraction to men was influenced by the man's dominance, but not in ways fully anticipated by Sadalla et al. (1987). Dominance by itself did not increase any form of
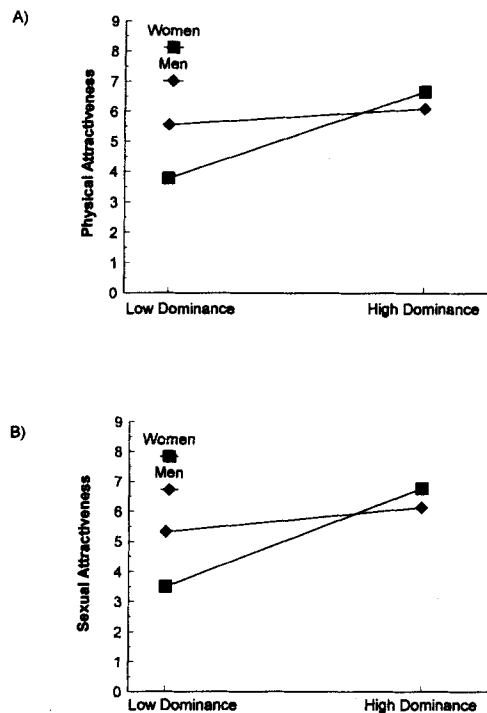
Figure 2. Study 3: Gender differences and the relation between dominance and attractiveness.

tion. More generally, dominance is a form of agentic behavior (Wiggins, 1991) and may be attractive within the contexts that Sadalla et al. provided to their raters. With additional, qualifying information, however, male agentic behavior may become less attractive to women. Specifically, our three studies suggest that men whose agency is linked to cooperative, altruistic tendencies should be preferred; men whose agency is linked to competitive, selfish tendencies should not.

Second, we attempted to give greater ecological validity to our study by leading women to believe that they would in fact interact with the men they observed (Studies 1 and 2); the participants in Sadalla et al. (1987) anticipated no actual interaction with the men. This prospect of future interaction may have made the potential rewards and costs of interacting with the man more salient (e.g., Berscheid & Graziano, 1979; Neuberg & Fiske, 1987).

At a more general theoretical level, our research outcomes are not necessarily inconsistent with evolutionary psychology, but only with a neo-Spencerian interpretation of it that focuses on dominance, conflict, and the struggle for survival. In fact, several of our findings are consistent with Trivers's (1972) model, a "middle-level evolutionary theory" (D. M. Buss, 1995). Trivers asserted that women prefer men who are able and willing to share resources, and the results of our studies are consistent with this assertion.

What is not clear, however, is the precise psychological mechanism underlying the patterns of female attraction to men.

attraction we measured, including sexual attraction. Across all measures, attraction was an interactive function of dominance and agreeableness. Dominance seemed to have no effect on the attractiveness of men who were low in agreeableness. For men who were high in agreeableness, however, dominance did increase subjective physical attractiveness, sexual attractiveness, dating desirability, general social desirability, and perceived wealth later in life.

Study 3 provided the strongest support for Sadalla et al.'s (1987) hypotheses about dominance. Women found the dominant man more sexually and physically attractive than the nondominant man, but there was no evidence that female dominance affected male attraction to women. Further support for Sadalla et al.'s findings can be found in ratings of dating desirability. For women, male dominance was related to dating desirability. Even in this study, however, a man's prosocial, agreeable tendencies were potent in affecting female attraction to him. In the case of dating desirability, for example, female attraction was an interactive function of male dominance and agreeableness. Dominance seems to matter when a man is high in agreeableness. When a man is low in agreeableness, however, dominance seems to have no effect. For men, there was no evidence that female dominance affected attraction.

There are probably several ways of resolving the apparent inconsistency between our results and those of Sadalla et al. (1987). First, we provided more information to our female raters than Sadalla et al. provided to theirs. It is conceivable that had Sadalla et al. provided their participants with information about prosocial tendencies in their stimulus persons, they also may have found a Dominance × Prosocial disposition interac-
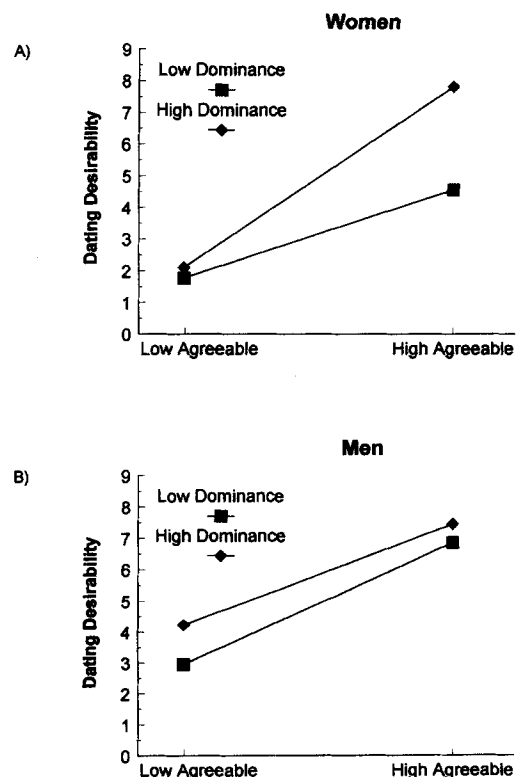

Figure 3. Study 3: Gender differences and the relation between dominance, agreeableness, and dating desirability.

There are immediate, proximal social influences that contribute to female attraction to men (e.g., Graziano, Jensen-Campbell, Shebilske, & Lundgren, 1993; Hatfield & Sprecher, 1986). For Trivers, however, the key mechanism is more distal; it is related to sex differences in patterns of parental investment. The sex that invests more in offspring (in humans, usually women) will evolve to be more choosy about mating. When males can contribute resources to offspring, females will select mates in part on the basis of their ability and willingness to contribute resources.

Part of the imprecision comes from Trivers's (1972) lack of discussion of a psychological mechanism in his model relating parental investment to female partner choice. This may be no deficiency when the primary focus is on birds, but it is a more serious problem in applying the model to humans. Presumably, the psychological mechanism in humans would involve the subjective, phenomenological feelings of attraction, which would be the proximal "active ingredient" in females' partner choice. Were we to grant Trivers's model some verisimilitude, results of our studies suggest that there would be need for modification and refinement to allow altruism and agreeableness a place at the evolutionary table as a coequal with dominance. It is likely that both altruism and dominance influence the more proximal psychological mechanism of attraction.

It is possible, of course, that attraction is a proximal epiphenomenon, with more distal evolutionary events being the causal event. Trivers (1972) seemed to endorse this position in stating that "The pattern of relative parental investment in species today seems strongly influenced by the early evolutionary differentiation into mobile sex cells fertilizing immobile ones, and sexual selection acts to mold the pattern of relative parental investment" (p. 173). Clearly, further work is needed to provide more precise links between evolutionary theories and psychological mechanisms that apply to human attraction (D. M. Buss, 1995).

With the wisdom of hindsight, we note that previous research reported evidence supporting the claim that women find prosocial orientations in men attractive. D. M. Buss and Barnes (1986), for example, found that the single most important attribute in a potential mate was the disposition toward kindness and understanding (see Table 5, p. 568). This rank held for both men and women. Results of our present program of research suggest, however, that we need to move beyond lists and categories of desirable attributes in mates. Simple, univariate accounts of attraction that do not specify context probably will not fare well in prediction, whether they involve dominance alone or altruism alone. This is as true of theories involving sociocultural forces as it is of theories based on evolutionary psychology (cf. Graziano et al., 1993).

It is also interesting that even in the literature on physical attractiveness, women regularly reported that a man's "personality" was an important attribute. In that literature, women's claims were often discounted. In their classic review of the physical attractiveness literature, Berscheid and Walster (1978) appropriately quoted one research team that explicitly asserted that participants are "either not fully aware or not fully honest about how important physical attractiveness really is to them" (Miller & Rivenbark, 1970, p. 702). Maybe the problem was with the researchers and not the participants. That is, past attraction research may not have been designed adequately to examine the complexity of women's interpretation of men's "personality."

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