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One woman's behavior affects the attractiveness of others☆

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Abstract

Previous research has shown that viewing photos of highly attractive women adversely affects men's evaluations of more typical women and of their own romantic partners. We could not replicate these results, but induced similar effects by showing participants an innocuous mock video interview of an opposite-sex stranger. Mated men's ratings of their partners and unattached men's ratings of other women were both lower if the interviewee had smiled and acted warmly than if she seemed uninterested, whereas women exhibited no such effects of watching a male interviewee. The results support the hypothesis that perceptions of attractiveness function to assist effective allocation of mating effort, not only in response to the relative quality of potential courtship targets but also in response to behavioral predictors of positive outcome.

Keywords: Attractiveness; Contrast effects; Mating effort; Proceptivity; Sex differences; Evolutionary psychology

1. Introduction

In a series of studies, Kenrick and Gutierres (1980), Kenrick, Gutierres, and Goldberg (1989), and Kenrick, Neuberg, Zierk, and Krones (1994) have shown that looking at photographs of attractive women has an adverse effect on men's evaluations of more typical women and of their own female partners. Their interpretation of "contrast effects" is that the photographs are evolutionarily novel stimuli that "trick" mental processes whose function is local mate pool assessment, much as viewing pornography can trick men's psychophysiology into responses whose adaptive function resides in real sexual interactions.

This domain-specific interpretation is supported—against the alternative that such effects are consequences of basic perceptual processes regardless of content domain—by the fact that results are qualitatively and quantitatively different when women look at pictures of men. Whereas men's ratings of their partners were adversely affected by viewing attractive opposite-sex models, women's ratings of their partners were not, and an analogous effect could be induced in women, but not in men, by supplementing photographs with biographical information indicative of high dominance (Kenrick et al., 1989, 1994). This pattern of results was predicted on the basis of evolutionary theorizing and prior research (e.g., Buss, 1989), indicating that men attend to physical attractiveness in potential partners more than do women, and women attend to predictors of social and material success more than do men.

Whether an opposite-sex individual is an acceptable mate often depends on available alternatives, and even in species in which females are choosy and males are relatively indiscriminate, the latter still face the problem of adaptively allocating mating effort (e.g., Engqvist & Sauer, 2001). Clark (submitted for publication) has argued that the phenomenology of finding others more or less attractive functions to help people allocate mating effort effectively, and that a woman's attractiveness to a man should thus be influenced not only by her intrinsic attributes (her mate value) but also by cues indicative of whether courtship directed at her might succeed. In support of this argument, Clark has shown that watching a video of proceptive behavior apparently directed at the rater (smiling, touching one's hair, and generally exhibiting cues inviting further interaction) has an enduring positive effect on the viewer's perception of the actor's attractiveness. If this effect indeed mediates the reallocation of mating effort among potential targets, it may also be accompanied by contrast effects such as those reported by Kenrick et al., affecting the perceived attractiveness both of relationship partners and of anyone else who might, in principle, be an appropriate courtship target.

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We report two experiments to test these ideas. First, we assessed whether the previously reported contrast effects of viewing attractive models versus art would hold up in our contemporary Canadian undergraduate sample. We then assessed whether the same effects could be induced by a video presenting cues of interaction with a proceptive opposite-sex person, in comparison to a control video of the same actor behaving unreceptively.

2. Experiment 1

2.1. Methods

Participants were 87 male and 66 female undergraduates (age: mean±S.D.=19.1±2.3 years) who were enrolled in an introductory psychology course. Each participant was visually isolated while seated in front of a computer on which stimuli were presented and responses were recorded. Successive computer screens first posed biographic questions and then presented a series of 15 photographs, obtained from public domain Web sites, to be rated. For this task, participants were randomly assigned to one of two stimulus sets: (a) upper-body photographs of prerated highly attractive opposite-sex underwear models, obtained from men's and women's underwear catalogues, or (b) abstract art, consisting of simple patterns of colors. Participants were asked to rate the attractiveness of each photograph on a 6-point Likert scale (1=*not attractive*, 6=*very attractive*). To encourage careful scrutiny of the images, estimates of the painting's decade of creation or the model's age were also elicited.

One of the initial biographical questions was the respondent's current relationship status, and the answers determined which of two sets of further questions were asked after stimulus (model or art) presentation. Those who were currently "mated" ("dating one person exclusively," "living with boyfriend/girlfriend," or "living with husband/wife/partner") answered Question Set A, whereas those who were "unattached" ("dating not exclusively or "not dating or not in a relationship") answered Question Set B.

2.1.1. Question Set A: judgments of current relationship partner

Following Kenrick et al. (1994), mated participants (n=51; 28 males and 23 females) rated their current partners on 17 attributes ("interesting," "romantic," "dominant," "intelligent," "physically attractive," "warm," "commanding," "understanding," "likable," "passionate," "powerful," "desirable to the opposite sex," "sexually attractive," "pleasant," "emotionally expressive," "natural leader," and "sociable") on a scale from 1 (*not*...) to 100 (*very*...).

2.1.2. Question Set B: ratings of unknown students' photographs

Unattached participants (n=102; 59 males and 43 females) viewed a series of seven head-and-shoulder photographs of opposite-sex students from another university, which had been prerated as "average" (neither highly attractive nor unattractive) in a previous study. For each picture, participants first rated the attractiveness of the stimulus student on the same 6-point scale on which they had rated models or art, and then provided a second rating of whether the pictured person met the participant's threshold for a potential date on a 4-point Likert scale (1=*far below threshold*, 2=*below threshold*, 3=*above threshold*, 4=*far above threshold*).

2.2. Results

Both sexes rated the models more attractive than the abstract art (mean ratings of males: models=4.7, art=3.1, t_{85}=10.49, p<.001; mean ratings of females: models=3.7, art=2.9, t_{64}=4.59, p<.001), but this stimulus condition effect was more substantial in males [Sex×Stimulus Condition interaction: $F(1,149)$=30.71, p<.001].

2.2.1. Question Set A: effects of viewing models versus art on evaluations of relationship partners

Following Kenrick et al. (1994), we ran 2×2 (Sex×Stimulus Set) analyses of variance (ANOVA) on an overall composite measure of partner evaluation, and averages for two subsets, namely, (a) sexual attractiveness, physical attractiveness, and desirability; and (b) dominant, commanding, powerful, and natural leader. None of the analyses yielded any significant effect (all ps>.1).

Exploratory 2×2 (Sex×Stimulus Set) ANOVA were conducted on the average ratings of relationship partners on all 17 items. Only one comparison provided any indication of anticipated contrast effects: a marginally significant Sex×Stimulus Condition interaction effect [$F(1,47)$=3.78, p=.06] indicates that men who had viewed models rated their partners as less physically attractive than those who had viewed art (mean: 79.8 vs. 90.8, respectively, t_{26}=2.10, p<.05). Women exhibited no significant difference (mean: 90.0 vs. 85.8, respectively, p>.5). Because correlations among the ratings were highly variable and occasionally negative, we subjected them to principal components analysis (PCA) and ran similar ANOVA on the five significant factors obtained from the PCA, again without significant effects. With a Bonferonni α correction for multiple exploratory post hoc tests (α=.05/22=.002), however, no significant differences remained.

2.2.2. Question Set B: effects of viewing models versus art on evaluations of opposite-sex strangers

After viewing experimental stimuli, unattached participants rated seven "average" opposite-sex faces with respect to attractiveness and their proximity to the rater's "dating threshold." Ratings of the seven stimuli were reduced to average values (Cronbach's α=.80 and .85 for the two measures), with results shown in Fig. 1.

For both sexes, ratings after viewing models were lower than after viewing art (attractiveness: men, t_{57}=2.77, p<.01, women, t_{41}=4.30, p<.001; dating threshold: men, t_{57}=2.56, p=.01, women, t_{41}=4.28, p<.001). A significant

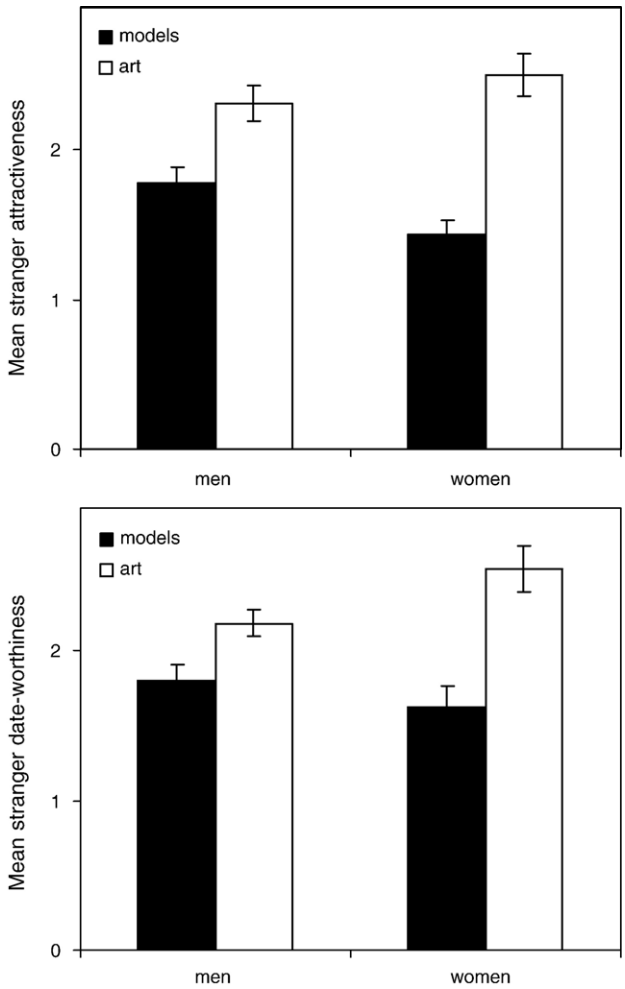

Fig. 1. Mean (±S.E.) ratings by unattached participants of "average" students' photos in Experiment 1 with respect to attractiveness (top panel) and position relative to the rater's "dating threshold" (bottom panel), after viewing either underwear models or abstract art.

Sex×Stimulus Condition interaction effect [attractiveness measure: $F(1,98)=4.81$, $p<.05$; dating threshold: $F(1,98)=4.99$, $p<.05$] indicates that these contrast effects induced by viewing attractive models were larger in women than in men.

3. Experiment 2

3.1. Methods

Participants were 72 male and 79 female undergraduates (age: mean±S.D.=20.0±3.3 years) enrolled in a first-year psychology course. The procedure was identical to that of Experiment 1, except for differences in the stimuli seen between the initial biographical questions and the final rating tasks: instead of underwear models versus art, randomly assigned participants saw one of two short (101–120 s) videotaped mock interviews of a moderately attractive opposite-sex drama student, taken directly from Clark (submitted for publication).

Each pair of videos was shot in a single session and featured the same actor, identically groomed and dressed, facing the camera from the same distance and giving essentially the same answers to the same set of innocuous questions (e.g., "Why do you think is it important to vote?"). All answers were neutral and contained no potential confounding content, such as cues of parental investment willingness or ability. How the pair of videos differed was in the actor's affect. In one, the actor behaved proceptively: smiling, looking directly at the camera, and generally acting as if encouraging future interaction. In the other, the actor behaved unreceptively: never smiling, letting one' gaze wander, and sounding bored. Clark (submitted for publication) has verified that these videos are perceived as proceptive versus unreceptive, and that opposite-sex judges rated the male and female versions almost identically in this regard.

After viewing the mock interview, participants were asked to rate a still photograph of the actor (the same neutral-expression photograph regardless of which video had been seen) on a 6-point Likert scale (1=*not attractive*, 6=*very attractive*) and to estimate the actor's age. As in Experiment 1, participants then answered either Question Set A or Question Set B, depending on their responses to the current relationship status question (which had been asked before the video was seen).

3.2. Results

Participants of both sexes rated the actor's photograph significantly more attractive if they had just viewed the proceptive video rather than the unreceptive video: for men rating a female actor, the means were 4.2 and 2.8 ($t_{70}=5.27$, $p<.001$); for women rating a male actor, the means were 3.5 and 3.0 ($t_{77}=2.80$, $p<.01$). A significant Sex×Video Condition interaction [$F(1,147)=6.35$, $p<.05$] indicates that actor receptivity had a stronger effect on men's ratings than on women's ratings. Actor receptivity had no effects on

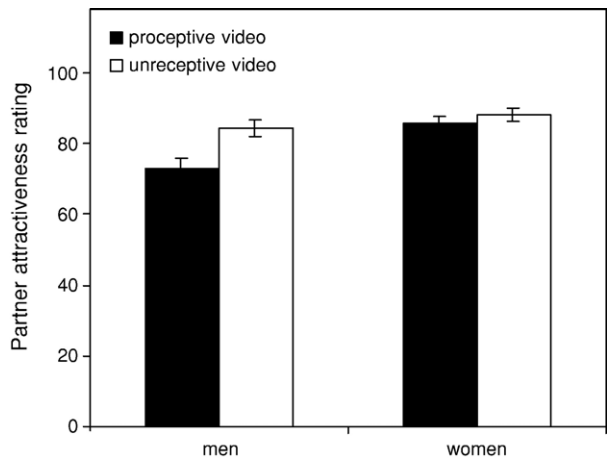

Fig. 2. Mean (±S.E.) ratings of the "physical attractiveness" of the raters' own relationship partners in Experiment 2, after viewing a mock video interview of an actor behaving either proceptively or unreceptively.

age estimates, and relationship status had no effects on attractiveness ratings.

3.2.1. Question Set A: effects of actor receptivity on evaluations of relationship partners

For mated participants (n=71; 33 men, 38 women), we ran 2×2 (Sex×Stimulus Set) ANOVA on the average ratings of relationship partners on a composite measure of overall partner attractiveness, calculated by averaging ratings for all partner personality characteristics. In addition, the 17 rating scales were subjected to a PCA, and a 2×2 (Sex×Stimulus Set) ANOVA was run on the one significant factor, PCA Factor 1, on which all attributes loaded positively, except for "commanding" and "dominant." The attractiveness and dominance composite measures from Experiment 1 were not analyzed in Experiment 2, as the PCA did not highlight them as significant factors.

The results demonstrate the effects of actor receptivity on partner ratings, but only among males: men who had viewed the proceptive video downrated their partners on the composite measure of overall partner attractiveness (α=.80) relative to those who had viewed the unreceptive video [Sex×Stimulus Condition interaction, $F(1,67)$=83.72, p<.001; for men, t_{31}=2.97, p<.01, for women, t_{36}=1.34, p>.1]. The same significant pattern of results was apparent for PCA Factor 1.

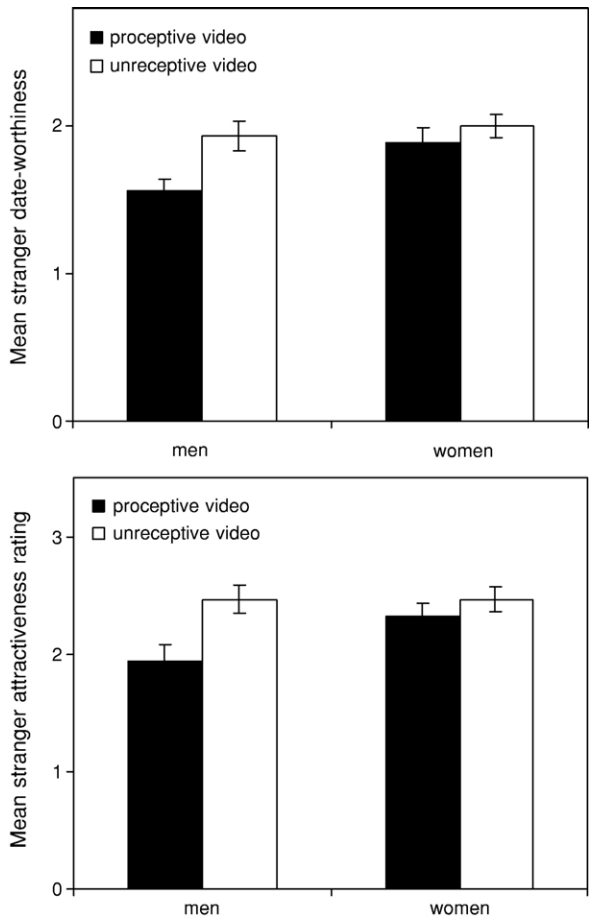

Fig. 3. Mean (±S.E.) ratings by unattached participants of "average" students' photos in Experiment 2 with respect to attractiveness (top panel) and position relative to the rater's "dating threshold" (bottom panel), after viewing a mock video interview of an actor behaving either proceptively or unreceptively.

Exploratory 2×2 (Sex×Stimulus Set) ANOVA were conducted on the ratings of relationship partners on all 17 items. The results also show the effects of actor receptivity on partner ratings only among males; Fig. 2 illustrates this effect with respect to mean partner ratings on the item "physically attractive" [Sex×Stimulus Condition interaction, $F(1,67)$=88.17, p<.001; for men, t_{31}=2.94, p<.01, for women, t_{36}=0.96, p>.3]. The same significant pattern of results was apparent for several individual item ratings ("romantic," "intelligent," "physically attractive," "understanding," "likable," "sexually attractive," and "passionate").

Because analyses of all 17 rating scales were exploratory and conducted post hoc, they were subject to a Bonferonni α correction for multiple tests (α=.05/17=.003). With this restriction, only the individual items "physically attractive," "understanding," "likable," and "sexually attractive" were statistically significant.

3.2.2. Question Set B: effects of actor receptivity on evaluations of opposite-sex strangers

As in Experiment 1, unattached participants (n=80; 39 men, 41 women) rated the attractiveness of seven "average" students, with the results presented in Fig. 3. A Sex×Stimulus Condition interaction was not significant [$F(1,76)$=0.744, p=.12]. Because a nonsignificant interaction in ANOVA may mask important underlying simple effects, lower-level comparisons were conducted (Wahlsten, 1990, p. 117). Men's ratings were affected by which video they had observed (attractiveness: t_{37}=2.86, p<.01; date worthiness: t_{37}=2.889, p<.01); women's ratings were not affected (both measures: t<1.0, p>.3).

4. Discussion

Previous findings suggesting that males exhibit a contrast effect when rating romantic partners in response to viewing photographs of attractive models (Kenrick et al., 1989, 1994) were not replicated in our Experiment 1. Men did not downrate their partners on a composite score of desirable attributes after viewing models, although a contrast effect was apparent for 1 of 17 attributes (physical attractiveness) before correcting for multiple comparisons. We did observe a contrast effect for composite scores in Experiment 2, however, when male participants were exposed to proceptive females. Because proceptive behavior may aid in the adaptive allocation of mating effort and such signals may indicate an immediate potential mating opportunity, this contrast effect suggests that males shift preferences in order to allocate mating effort toward immediate courtship targets.

Participants of both sexes rated the videotaped actors as more attractive when they acted proceptively, replicating the

results of Clark (submitted for publication), but men's ratings were more strongly affected than women's ratings and only men exhibited contrast effects by downrating other women and their own romantic partners. We expected this sex difference because signals of interest from the opposite sex are scarcer resources (of greater value) for men than for women. In mammals generally, the fitness of males is limited by the availability of willing partners to a much greater extent than is the fitness of females (Trivers, 1972), and human beings are no exception (e.g., Clark & Hatfield, 1989).

Kenrick et al. have interpreted their finding that viewing a series of attractive women diminishes the appeal of "average" women, as indicative of evaluative shifts in response to ancestral cues of the pool of potential mates. The contrast effects in our Experiment 2 extend the domain of such reactions to include evaluative shifts in response to cues of one particular woman's possible receptivity, thereby supporting the argument of Clark (submitted for publication) that finding others more or less attractive facilitates effective allocation of mating effort.

If only attractiveness had been rated by the unattached subjects, the contrast effects in Experiment 1 would have reflected nothing more than a subjective shift of rating scale anchors after seeing the models. However, the fact that these stimuli also influenced "date worthiness" suggests that such contrast effects could have behavioral consequences, at least in the short term. That the effect was larger in women than in men was unexpected and is surprising given that the men rated the opposite-sex models as more attractive than did the women. It is also contrary to the results of Kenrick et al. (1989, 1994), and whether this is because of subject pool differences or other factors is unclear. Because considerable evidence indicates that women are choosier about potential mates than are men (Buss, 1989; Daly & Wilson, 1983; Kenrick, 1989), one might propose that men's ratings of date worthiness were relatively unaffected by the stimuli because men are chronically eager and relatively indiscriminate. This interpretation, however, is challenged by the fact that men did not, in general, rate "average" strangers as more dateworthy than did women and by the results of Experiment 2, in which similar contrast effects were produced by the videos, but only in men, as anticipated.

The fact that proceptivity influenced men's ratings of their partners on multiple dimensions, not just physical attractiveness, may speak of the specific characteristics that constitute proceptive behavior. A proceptive human female may be seen not only as attractive but also as warm, likable, pleasant, and sociable. If so, one would expect that mated male participants' ratings of their partners would be reduced in these multiple domains of judgment upon exposure to proceptive behavior, and this pattern of results is indeed what we observed.

Do the contrast effects observed here and in previous research have implications for social phenomena outside the laboratory? Kenrick and Gutierres (1980) suggested that men who are chronically exposed to attractive young women in their work might adopt unrealistically high standards and thus experience dissatisfaction with females available to them, a conjecture supported by the observation of Kanazawa and Still (2000) that male high school teachers and college profe ssors have an unusually high incidence of divorce. Similarly, men exposed to depictions of women projecting proceptivity may experience inflated expectations of encountering receptive sexual partners. Media representations of proceptivity are probably not as salient as real-life encounters, but they may nonetheless have significant effects on social responses. Certainly, the psychology of *Homo sapiens* did not evolve in an environment laden with simulated social stimuli of the sort we experience today.

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References

Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12,* 1–49.

Clark, A. P. (submitted for publication). Attracting interest: Displays of proceptivity increase the attractiveness of men and women.

Clark, R. D., & Hatfield, E. (1989). Gender differs in receptivity to sexual offers. *Journal of Psychology and Human Sexuality, 2,* 39–55.

Daly, M., & Wilson, M. (1983). *Sex, evolution, and behavior*. (2nd ed). Belmont, CA: Wadsworth Publishing.

Engqvist, L., & Sauer, K. P. (2001). Strategic male mating effort and cryptic male choice in a scorpionfly. *Proceedings of the Royal Society of London Series B, 268,* 729–735.

Kanazawa, S., & Still, M. C. (2000). Teaching may be hazardous to your marriage. *Evolution and Human Behavior, 21,* 185–190.

Kenrick, D. T. (1989). Bridging social psychology and sociobiology: The case of sexual attraction. In: R. W. Bell & N. J. Bell (Eds.), *Sociobiology and the social sciences* (pp. 5–23). Lubbock, TX: Texas Tech University Press.

Kenrick, D. T., & Gutierres, S. E. (1980). Contrast effects and judgments of physical attractiveness: When beauty becomes a social problem. *Journal of Personality and Social Psychology, 38,* 131–141.

Kenrick, D. T., Gutierres, S. E., & Goldberg, L. (1989). Influence of popular erotica on judgements of strangers and mates. *Journal of Experimental Social Psychology, 25,* 159–167.

Kenrick, D. T., Neuberg, S. L., Zierk, K. L., & Krones, J. M. (1994). Evolution and social cognition: Contrast effects as a function of sex, dominance and physical attractiveness. *Personality and Social Psychology Bulletin, 20,* 210–217.

Trivers, R. L. (1972). Parental investment and sexual selection. In: B. Campbell (Ed.), *Sexual selection and the descent of man: 1871–1971* (pp. 136–179). Chicago: Aldine.

Wahlsten, D. (1990). Insensitivity of the analysis of variance to heredity–environment interaction. *Behavioral and Brain Sciences, 13,* 109–161.