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Success Attributions and More: Multidimensional Extensions of the Sexual Attribution Bias to Failure Attributions, Social Emotions, and the Desire for Social Interaction

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According to the recently discovered sexual attribution bias (SAB), young adults attribute the success of same-aged, same-sex attractive stimulus persons in a more derogative way than the success of less attractive same-sex persons, whereas this pattern is reversed for members of the opposite sex. Because this bias has so far only been investigated with respect to attributions in success scenarios, two studies examined its potential transferability to other psychological variables and settings: Study 1 (N = 419) demonstrated analogous biases for emotions and the desire for social interaction, and Study 2 (N = 509) revealed that the SAB can also be extended to failure scenarios.

Keywords: *attribution; emotion; social interaction; bias; sex differences; evolutionary psychology*

Social cognitive research has repeatedly documented that human judgment and rational decision making are prone to failure and bias in a number of ways (see e.g., Fiske & Taylor, 1991; Haselton & Buss, 2000; Kahneman, Slovic, & Tversky, 1982; Nisbett & Ross, 1980). Correspondingly, a series of studies on achievement attributions conducted by Försterling, Prekschas, and Agthe (2007) revealed a replicable bias according to which the successes of attractive persons of the opposite sex are attributed in a more glorifying fashion (i.e., more to ability and less to luck) than the very same outcomes achieved by unattractive individuals of the opposite sex, whereas

positive outcomes of attractive same-sex individuals are attributed in a more devaluating way (i.e., less to ability and more to luck) than unattractive same-sex individuals' successes. This phenomenon, which comprises a derogation component with respect to attractive same-sex individuals who may represent potential competitors and a glorification component that is mobilized when judging attractive opposite-sex individuals, was referred to by Försterling et al. (2007) as the *sexual attribution bias* (SAB).

Making devaluating attributions for the success of an attractive same-sex individual has been speculated to serve intrasexual competition by protecting self-esteem and maintaining faith in one's own ability and worth. On the other hand, glorifying causal ascriptions triggered by the attractiveness of opposite-sex targets might ensure that the opportunity to mate with individuals possessing desirable (genetic) qualities are not missed since positively evaluated persons are approached. Such positive evaluations of potential mates would therefore be expected to support and foster individual intentions regarding the optimistic (and hence persistent and

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potentially more successful) pursuit of evolutionarily rewarding partnerships (cf. Krebs & Denton, 1997). In line with this argumentation, the SAB should facilitate competitive behavior with good-looking same-sex individuals as well as bonding behavior with attractive opposite-sex individuals.

Försterling et al. (2007) provided support for their evolutionary argumentation based on mating motivation and intrasexual competition by demonstrating that the SAB disappears when prepubertal individuals (who are supposedly not regarded as mates or rivals) are to be judged and further showing that the SAB results in a derogation of attractive females (as potential rivals) and a glorification of attractive males (as potential mates) in the case of homosexual men.¹ In summary, the studies conducted by Försterling et al. have provided consistent evidence that attributions of success are systematically influenced by the specific attractiveness-gender constellation of the rater and the person being rated. An evolutionary explanation based on mating motivation and intrasexual competition corresponds with this pattern of results.

The present article addresses a series of questions relating to the SAB that have thus far remained unexplored. These pertain to whether the SAB is specific to attributions of success or whether the bias can be extended to emotional and behavioral psychological variables as well as to whether attributions (i.e., the psychological variables upon which the SAB has so far been based) play a pivotal role in the occurrence of the bias. Moreover, it is of interest to determine whether the SAB response pattern is transferable to a new context, for example, a failure situation, by examining whether the bias also occurs in connection with attributions of failure.

Because single attributions—in particular attributions to ability—constitute central elements of a broad spectrum of psychological phenomena including social behavior (e.g., Bandura, 1977; Försterling & Morgenstern, 2002), motivation (e.g., Dweck, 1999; Weiner, 1986), emotion (e.g., Weiner, 2006), and relationship formation (e.g., Fincham, 2001), it might be assumed that all such phenomena associated with causal ascriptions may prove susceptible to the SAB.

As an essential component of adaptive social thinking and behavior (Adolphs & Damasio, 2001; Blascovich & Mendes, 2000; Haselton & Buss, 2003), affect and affective states activated in response to threats and opportunities are functional to the solution of adaptive problems or the attainment of goals (e.g., Panksepp, 1982; Plutchik, 1980; Watson, Wiese, Vaidya, & Tellegen, 1999). By channeling individuals toward required courses of action in responding to challenges (Cosmides & Tooby, 2000), emotions are considered relevant for survival. In light of the fact that social

cognitions, affective processes, and behavioral tendencies are presumed to have coevolved to deal with highly significant stimuli and supposedly share some basic neural circuits and mechanisms (e.g., Norris, Chen, Zhu, Small, & Cacioppo, 2004; Winkielman & Cacioppo, 2006), and considering their well-documented variety of inherent interconnections (e.g., Forgas & Laham, 2004), it would seem plausible to assume that the processes underlying the SAB might also be reflected in the domains of emotion and social interaction.

Indications of such a multifaceted bias are in fact available, with some scattered findings from diverse areas of psychology reporting interactions corresponding to the SAB. Kenrick, Montello, Gutierrez, and Trost (1993), for instance, demonstrated that individuals who were exposed to pictures of attractive same-sex stimulus persons (SPs) showed significantly lower mood than those who had viewed photographs of average-looking same-sex SPs, whereas this effect was reversed for opposite-sex SPs, whose attractiveness resulted in a significantly better mood of the participants. This finding can be interpreted as being compatible with the SAB; negative affective reactions to attractive same-sex individuals might be a function of unfavorable comparisons with the self.

With regard to social interaction, Krebs and Adinolfi (1978) found that while physically attractive opposite-sex persons were favored, the most attractive same-sex persons were rejected. This corresponds with considerations that physical attractiveness might be a disadvantage in making friends with same-sex individuals who wish to avoid unfavorable comparisons (cf. Anderson & Nida, 1978; Bleske & Shackelford, 2001; Etcoff, 1999; Gallucci & Meyer, 1984).

Accordingly, a bias analogous to the SAB in attributions of success can be expected for emotions and social interaction intentions. Yet research thus far has failed to address the postulation and empirical examination of such a *multidimensional biased response pattern* (i.e., a preference for attractive vs. less attractive opposite-sex targets and low vs. highly attractive same-sex targets), which would provide a framework for the scattered analogous findings reported in domains other than attributions of success.

Study 1 was conducted with the aim of empirically determining whether the SAB is specific to attributions of success or whether similar response patterns are also to be found in the domains of emotions and behavioral tendencies. It was further investigated whether attributions, emotions, or behavioral tendencies are inherently related to the occurrence of the SAB.

Study 2 addressed the question as to whether the SAB persists in scenarios in which the SP experiences failure rather than success. This would affirm the theoretically relevant assumption that physical attractiveness and

gender constellation are sufficient conditions for the occurrence of the SAB in young adults and that the bias or more specifically the derogation component of the bias does not depend on success of the SP. The application of a failure scenario additionally enabled an investigation of the bias with respect to failure attributions, which have thus far not been subject to examination.

We more specifically hypothesized that failure on the part of the SP would lead to the occurrence of the SAB, though to a reduced degree: Because social comparison should be less threatening than is the case when the SP is successful and physically superior (cf. Major, Testa, & Bylsma, 1991; Salovey, 1991), envy (involving hostility and dislike) of an advantaged person might be appeased when the SP experiences misfortune (cf. Smith, 2000), as a result of which the intensity of derogation is decreased. Moreover, the failure scenario might also reduce the likelihood of the emergence of a glorification component by offering less ground for positive evaluations. Study 2 was thus performed to test the hypothesis that failure of the SP diminishes but does not eliminate the SAB with respect to failure attributions and to investigate the multidimensional nature of this biased response pattern in terms of whether it is also to be found in a failure context.

STUDY 1

Study 1 was designed to test the hypothesis that the SAB response pattern is not only observable for attributions of successful outcomes but can also be replicated in the context of emotions and social interaction intentions. Participants were thus expected to not only causally explain the outcome of an attractive same-sex individual in a more derogative fashion than that of an unattractive SP but to also demonstrate less positive and more negative emotions as well as more social avoidance behavior in imagined encounters with an attractive same-sex SP as compared with encounters with an unattractive same-sex SP, who should evoke more favorable emotions and whose company should be more welcome. The reverse response pattern was expected for an opposite-sex SP: Not only should an attractive opposite-sex individual's outcome be attributed in a more glorifying manner than that of an unattractive opposite-sex SP, but their attractiveness should also evoke stronger positive emotional reactions and a greater desire for social interaction than is the case for unattractive opposite-sex individuals.

A further aim of Study 1 was to statistically investigate whether cognitions (here: attributions), emotions, or the desire for social interactions play a pivotal role in the emergence of this biased response pattern. Specifically, the SAB pattern could be in accordance

either with classical appraisal and attribution models (Lazarus, 1966, 1991, 1999; Weiner, 1980) or alternatively, with theories on the primacy of emotions (Zajonc, 1980, 2000) and affect infusion models (e.g., Forgas, 1995). Determining whether affective processing of potentially threatening competitors or desired mates is shaped by associated cognitions, or vice versa, could give hints on which of these two groups of theories is most valuable in explaining the response pattern of the SAB.

Method

Experimental design. Study 1 was based on a 2 (Sex of Participant) \times 2 (Sex of SP) \times 2 (Attractiveness of SP: high vs. low) \times 3 (Picture Set) independent measures design.

Material. A pretest was conducted in order to select photographs of fictitious applicants that were used to manipulate attractiveness of the SP in the main studies. From an initial pool of more than 1,000 photographs derived by scanning college graduate yearbooks and freely available Internet sources, a subset of 300 pictures was selected based on the following criteria: (a) They were all facial passport-sized photographs, (b) the person depicted appeared to be in his or her 20s, and (c) was of Caucasian descent. The 300 photographs were subsequently rated by 20 female and 20 male university students on a 10-point Likert scale ranging from 1 (*unattractive*) to 10 (*very attractive*). Based on pretest mean scores of attractiveness, three picture sets (each comprising four pictures) were selected. The six attractive SPs selected had mean ratings above 7.0 and below 9.0, and the six unattractive SPs had scores above 2.0 and below 4.0.² Participants of this pilot study did not take part in the two reported main studies.

The scenario applied in the questionnaire of Study 1 corresponded to that employed by Försterling et al. (2007). Participants were first asked to indicate their age and sex before being requested to answer some questions concerning the (male or female) SP who was described in a short text and whose photo was presented on the questionnaire. For the purpose of disguising study intentions, participants also received detailed information on the educational, occupational, and social background of the SP in the text. The successful employment of the SP following his or her application was portrayed and the cover story concluded with his or her surprisingly early promotion in the job. While this information given to the respondents was held constant, the SP's sex and attractiveness were manipulated by attaching a passport-sized black-and-white facial photograph of an attractive or less attractive male or female SP to the questionnaire.³ To further

highlight the sex of the target, the first name used to introduce the SP was a typical name for the respective gender in the authors' country.

In the third section, participants were requested to intuitively answer some questions regarding their impressions of the SP. They were assured that all answers would be treated confidentially and anonymously.

Achievement attributions. Regarding achievement ascriptions, the same dependent variables were used as those employed by Försterling et al. (2007): Participants were instructed to attribute the early success of the SP to (a) ability and (b) luck using two scales ranging from 1 (*hardly important*) to 10 (*very important*).

Affective responses to the SP. To elicit affective responses to stimulus targets, respondents were asked to imagine that they themselves had been in direct competition with the SP when applying for a job and that they had failed to get the job while the SP had been offered the contract of employment. Following this instruction, participants were requested to indicate on scales ranging from 1 (*hardly*) to 10 (*very much*) the extent to which they would feel the following affective responses toward the SP.

Positive emotional response toward the SP. Respondents indicated on four rating scales the extent to which they would feel (1) liking, (2) benevolence, (3) admiration, and (4) appreciation with regard to the SP. These four items together formed a scale with high internal consistency (Cronbach's $\alpha = .80$). Based on item content, the mean value of the four items was labeled *positive emotional response toward the SP*.

Negative emotional response toward the SP. Analogously, respondents indicated on four rating scales the extent to which they would feel (1) envy, (2) contempt, (3) antipathy, and (4) hostility toward the SP. These four items together formed a scale with high internal consistency (Cronbach's $\alpha = .85$). Based on item content, the mean value of the four items was labeled *negative emotional response toward the SP*.

Desire for social interaction with the SP. Finally, to assess the desire for social interaction with the SP, participants were asked to state the degree to which they would like to (1) work and (2) become friends with the SP on two scales again ranging from 1 (*rather not*) to 10 (*very much*). These two items together formed a scale with high internal consistency (Cronbach's $\alpha = .79$). The mean score of these two variables was labeled *desire for social interaction with the SP*.⁴

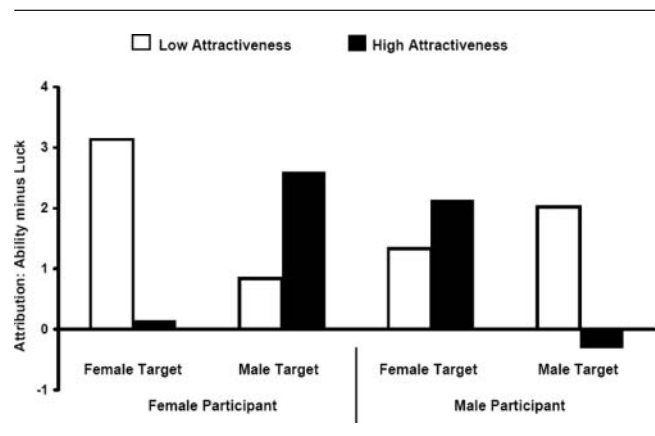


Figure 1 Attributions of success to internal causes (i.e., ability minus luck) as a function of participants' gender and stimulus persons' attractiveness and gender.

Manipulation checks. Participants were asked to rate the attractiveness of the SP on a scale ranging from 1 (*unattractive*) to 10 (*very attractive*).

Participants and procedure. The study was conducted with 419 participants (209 male and 210 female students) who were individually approached and asked to complete the questionnaire on the campus of the authors' university. Female participants had a mean age of 23.30 years ($SD = 3.92$) and males of 21.76 years ($SD = 3.31$). Students who agreed to participate were randomly presented with one of the four experimental conditions. Upon completion, participants were debriefed and thanked. All 419 participated voluntarily without being paid for their cooperation.

Results

Manipulation checks. A 2 (Respondent's Sex) \times 2 (SP's Sex) \times 2 (Attractiveness of SP: high vs. low) ANOVA with independent measures on all factors and attractiveness ratings as dependent variable yielded the intended significant main effect of attractiveness, $F(1, 407) = 342.17, p < .001, \eta^2 = .42$. Participants rated the attractive SPs as more attractive ($M = 7.26, SD = 2.16$) than the unattractive SPs ($M = 3.93, SD = 1.77$).⁵

Attributions. In line with Försterling et al. (2007), an ability-minus-luck indicator was computed as a measure of the extent to which the SP's positive outcome was attributed to internal causes. Analyses yielded the predicted three-way Sex of Participant \times Sex of SP \times Attractiveness of SP interaction, thus replicating the SAB, $F(1, 411) = 50.44, p < .001, \eta^2 = .11$ (see Figure 1).⁶

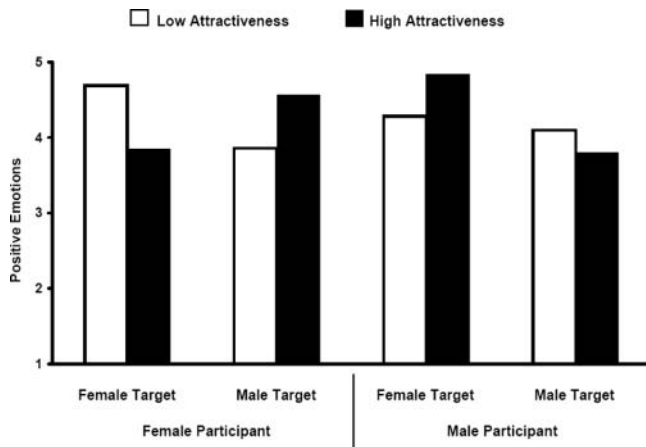


Figure 2 Positive emotions toward a successful stimulus person according to participants' gender and stimulus persons' attractiveness and gender.

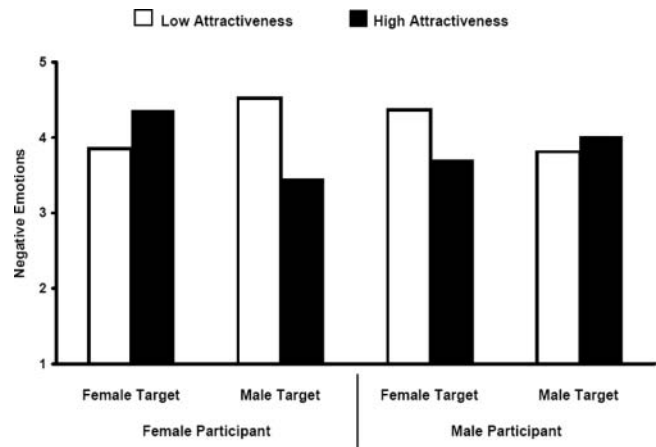


Figure 3 Negative emotions toward a successful stimulus person according to participants' gender and stimulus persons' attractiveness and gender.

ANOVAs conducted separately according to participants' sex confirmed that males attributed the success of a male SP less to internal causes when he was attractive ($M = -0.30$, $SD = 2.83$) than when he was unattractive ($M = 2.02$, $SD = 2.58$), $t(102) = 4.37$, $p < .001$; and the success of female SPs more to internal causes when she was attractive ($M = 2.13$, $SD = 3.11$) than when she was unattractive ($M = 1.33$, $SD = 3.08$), $t(103) = -1.31$, ns , $F(1, 205) = 14.91$, $p < .001$, $\eta^2 = .07$. In contrast, female participants gave more internal reasons in explaining the success of attractive male SPs ($M = 2.60$, $SD = 2.27$) than the success of unattractive male SPs ($M = 0.84$, $SD = 3.11$), $t(98) = -3.18$, $p < .01$; whereas they attributed the success of attractive female SPs less to internal causes ($M = 0.14$, $SD = 2.89$) than the success of unattractive female SPs ($M = 3.13$, $SD = 2.55$), $t(108) = 5.76$, $p < .001$, $F(1, 206) = 39.14$, $p < .001$, $\eta^2 = .16$.

Positive emotional response toward the SP. A 2 (Respondent's Sex) \times 2 (SP's Sex) \times 2 (Attractiveness of SP: high vs. low) independent measures ANOVA was conducted with positive emotional response as dependent variable. Analysis yielded a significant three-way Sex of Participant \times Sex of SP \times Attractiveness of SP interaction, $F(1, 407) = 13.25$, $p < .001$, $\eta^2 = .03$ (see Figure 2).⁷ Men reported less positive emotions toward an attractive male SP ($M = 3.80$, $SD = 1.87$) than toward an unattractive male SP ($M = 4.10$, $SD = 1.65$), $t(102) = 0.88$, ns ; while they had more positive feelings toward an attractive female SP ($M = 4.84$, $SD = 1.70$) than toward an unattractive female SP ($M = 4.28$, $SD = 1.68$), $t(102) = -1.69$, ns , $F(1, 204) = 3.26$, $p = .07$, ns . This pattern was reversed for the emotional responses

indicated by female participants: Their reactions were more positive toward attractive men ($M = 4.56$, $SD = 1.65$) than toward unattractive men ($M = 3.86$, $SD = 1.50$), $t(97) = -2.20$, $p < .05$; while they felt less positive toward an attractive female ($M = 3.85$, $SD = 1.60$) than toward an unattractive female SP ($M = 4.69$, $SD = 1.73$), $t(106) = 2.60$, $p < .05$, $F(1, 203) = 11.48$, $p < .001$, $\eta^2 = .05$. This response pattern for positive emotions is congruent with the SAB pattern found for attributions of success.

Negative emotional response toward the SP. Analysis accordingly yielded the expected significant three-way interaction for negative emotional response, $F(1, 408) = 9.17$, $p < .01$, $\eta^2 = .02$ (see Figure 3).⁸ Men reported slightly more negative emotions toward an attractive male SP ($M = 4.02$, $SD = 2.19$) than toward an unattractive male SP ($M = 3.81$, $SD = 1.96$), $t(102) = -0.53$, ns ; while they had less negative feelings toward an attractive female SP ($M = 3.70$, $SD = 1.95$) than toward an unattractive female SP ($M = 4.37$, $SD = 2.35$), $t(102) = 1.55$, ns , $F(1, 204) = 2.20$, ns . This pattern was reversed for the negative emotions indicated by female participants: Their reactions were less negative toward attractive men ($M = 3.45$, $SD = 1.73$) than toward unattractive men ($M = 4.52$, $SD = 2.26$), $t(97) = 2.66$, $p < .01$; and more negative toward an attractive female ($M = 4.36$, $SD = 1.81$) than toward an unattractive female SP ($M = 3.85$, $SD = 2.04$), $t(107) = -1.36$, ns , $F(1, 204) = 8.06$, $p < .01$, $\eta^2 = .04$. This response pattern for negative emotions is (although less pronounced)⁹ analogous to that observed for positive emotions and for success attributions (i.e., the SAB).

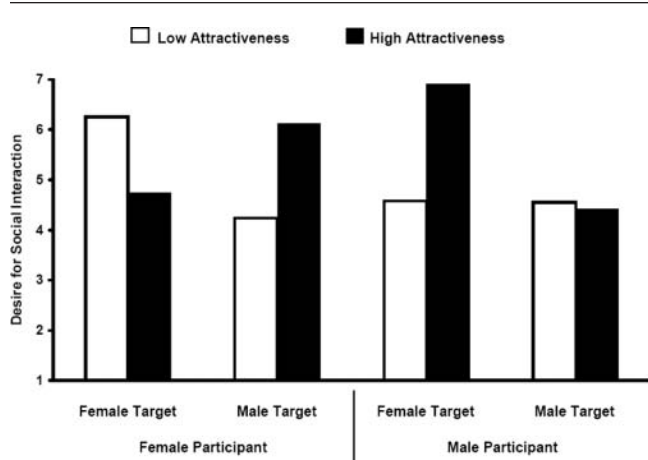


Figure 4 Desire for social interaction with a successful stimulus person according to participants' gender and stimulus persons' attractiveness and gender.

Desire for social interaction with the SP. Finally, a significant Sex of Participant \times Sex of SP \times Attractiveness of SP three-way interaction was also obtained for the desire for social interaction with the SP, $F(1, 407) = 53.43, p < .001, \eta^2 = .11$ (see Figure 4).¹⁰

Separate ANOVAs conducted for the sexes revealed that male participants were slightly less inclined to want to socially interact with attractive male SPs ($M = 4.42, SD = 2.25$) than with unattractive male SPs ($M = 4.55, SD = 1.96$), $t(102) = 0.31, ns$; while they favored social interaction with an attractive female SP ($M = 6.91, SD = 2.21$) as compared with an unattractive female SP ($M = 4.58, SD = 1.99$), $t(101) = -5.65, p < .001, F(1, 203) = 17.73, p < .001, \eta^2 = .07$. Analogously, female participants indicated a stronger inclination toward socially interacting with attractive male SPs ($M = 6.12, SD = 1.79$) than with unattractive male SPs ($M = 4.24, SD = 1.68$), $t(96) = -5.33, p < .001$; while they were less inclined to want to engage in social contact with attractive female SPs ($M = 4.74, SD = 2.08$) than with unattractive female SPs ($M = 6.25, SD = 2.17$), $t(108) = 3.69, p < .001, F(1, 204) = 38.45, p < .001, \eta^2 = .16$.

Covariance analyses. When entering attributions as dependent variable and positive emotions, negative emotions, and the desire for social interaction as covariates (simultaneously and in separate analyses for each covariate) in 2 (Sex of Participant) \times 2 (Sex of SP) \times 2 (Attractiveness of SP) ANCOVAs, results indicated that although the three-way interaction for attribution was reduced, it was still significant, $F_s > 39.00, p_s < .001$, indicating that variance in attributions is not fully explained by emotions and the desire for social interaction.

Corresponding analyses were also performed for positive emotional responses. ANCOVAs indicated that

the three-way interaction only disappeared ($F_s < 0.20$) when desire for social interaction was included as a covariate (alone or together with the other variables). Including the other variables as covariates resulted in a reduction of the three-way interaction, which, however, remained significant, $F_s > 8.00, p_s < .005$.

This pattern was replicated for negative emotions; the previously significant three-way interaction was reduced by including the covariates but remained significant, $F_s > 3.80, p_s \leq .05$, unless the desire for social interaction was included (alone or together with the other variables), in which case the interaction was no longer significant, $F_s < 2.50, p > .10$.

Finally, the significant three-way interaction for desire for social interaction was reduced by including covariates but remained significant, $F_s > 27.00, p_s < .001$.

Consequently, we may conclude that attributions and the desire for social interaction are distinct concepts whose variance cannot be attributed to the other variables under examination, whereas the variance in emotional response can largely be attributed to the desire for social interaction.

Discussion

Study 1 demonstrated that the SAB response pattern is not only replicable for attributions but also for both positive and negative emotions toward the SP as well as for the desire for social interaction with the SP. This suggests that attributions, emotions, and behavioral tendencies all follow analogous assumptions derived from evolutionary psychology: Whereas same-sex rivals are more likely to be derogated, avoided, and evoke negative emotions, desirable opposite-sex individuals are prone to be glorified, approached, and evoke positive feelings.

Because emotional and behavioral response patterns resembled the biased responses observed in the context of attributions, we conclude that the SAB pattern is not specific to attributions but can instead be considered to be part of a multidimensional attractiveness-gender bias. Given that evolutionary selective forces cannot be presumed to exclusively apply to cognitions and that a variety of contextual relations are likely to exist between cognitions, emotions, and behavioral tendencies, this finding would appear highly plausible. Our results thus seem to confirm that not only human cognitions but also emotions and behaviors are dedicated to fostering and maintaining social bonds and particularly emphasize the central role of mating motivation and intrasexual competition.

In order to investigate the potential primacy of attribution in the multidimensional SAB-consistent patterns, we performed a series of ANCOVAs that indicated that attribution and the desire for social interaction feature high levels of specific variance that cannot be ascribed to either each other or to affective reactions. In contrast,

these positive and negative emotional reactions seem to be strongly related to the desire for social interaction. Hence, our results indicate that attributions and the desire for social interaction represent distinct concepts that cannot be explained by emotional reactions, whereas these reactions appear to particularly depend on the desire for social interaction. The centrality of desire for social interaction is highly consistent with an evolutionary perspective. This variable can be regarded as a key concept in the regulation of social activities, which in turn greatly influence the evolutionary success of the phenotype.

Summarizing the results obtained so far, the SAB was replicated for attributions of success and generalized to positive and negative emotions and the desire for social interaction. With respect to emotions, results seem attributable to a desire for social interaction, whereas both the latter and attribution emerged as distinct concepts.

A further issue that remains to be addressed is whether the SAB and analogous attractiveness-gender biases with regard to emotions and behavioral intentions persist when situational variables are modified. Study 2 therefore applied a low-threat social comparison scenario with the aim of investigating whether the biased response pattern can be generalized to a scenario in which the SP experiences failure.

STUDY 2

Study 2 aimed to replicate the SAB for attributions in a modified scenario: Whereas the storylines used in Study 1 (and all previous SAB research) portrayed the success of a SP, Study 2 applied a failure scenario. This modification was designed to determine whether the SAB persists and is possibly diminished given a more favorable social comparison for participants. In the context of failure, the occurrence of the SAB and analogous attractiveness-gender biases for affective and behavioral variables would indicate that the observed biased response pattern is not limited to comparisons with successful targets. Because prior research on the SAB has thus far neglected failure attributions, this study aims to investigate both the generalization and robustness of the bias.

Method

Experimental design. Study 2 was based on a 2 (Sex of Participant) \times 2 (Sex of SP) \times 2 (Attractiveness of SP: high vs. low) independent measures design.

Material. The experimental material was almost identical with that used in Study 1 (depicting attractive and unattractive male and female SPs in their early 20s).

Participants were provided with the same three sets of pictures and biographical information as in Study 1. The only difference between the cover stories of Study 1 and Study 2 was that SPs in Study 2 experienced failure instead of success with regard to their job: While they were promoted in Study 1, their contract was not extended in Study 2. This fictive scenario was thus analogous to that used in Study 1 with the exception of the unsuccessful ending for the SP.

As in Study 1, participants were asked to intuitively answer questions on their impressions of the SP. They were assured that all answers would be treated confidentially and anonymously.

Achievement attributions. Dependent variables were the opposite of those used in Study 1: Participants were requested to explain the negative outcome of the SP by making attributions to (1) lack of ability and (2) bad luck on two scales ranging from 1 (*hardly important*) to 10 (*very important*).

Affective responses to the SP. To elicit affective responses to the targets, respondents were asked to imagine that they had directly competed with the SP in applying for a job, and they had obtained the position, while the SP had not been offered a contract of employment. Participants were then requested to indicate the extent to which they would feel the affective responses described in the following toward the SP on scales ranging from 1 (*hardly*) to 10 (*very much*).

Positive emotional response toward the SP. Respondents indicated on four rating scales the extent to which they would feel (1) liking, (2) benevolence, (3) sympathy, and (4) appreciation with regard to the SP. These four items together formed a scale with acceptable internal consistency (Cronbach's $\alpha = .63$). Based on item content, the mean value of the four items was labeled *positive emotional response toward the SP*.

Negative emotional response toward the SP. Analogously, respondents indicated on four rating scales the extent to which they would feel (1) gloating, (2) contempt, (3) antipathy, and (4) hostility toward the SP. These four items together formed a scale with satisfactory internal consistency (Cronbach's $\alpha = .74$). Based on item content, the mean value of the four items was labeled *negative emotional response toward the SP*.

Desire for social interaction with the SP. Finally, to assess the desire for social interaction with the SP, participants were asked how much they would like to (1) work and (2) become friends with the SP. Responses were made on two scales ranging again from 1 (*rather not*)

to 10 (*very much*). These two items together formed a scale with high internal consistency (Cronbach's $\alpha = .78$). The mean score of these two dependent variables was labeled *desire for social interaction with the SP*.

Manipulation checks. Participants were asked to rate the attractiveness of the SP on a scale ranging from 1 (*unattractive*) to 10 (*very attractive*).

Participants and procedure. The study was conducted with 509 participants (214 male and 295 female students) who were individually recruited on the campus of the authors' university. Female participants had a mean age of 21.48 years ($SD = 3.62$) and males of 22.71 years ($SD = 3.65$). The procedure was analogous to Study 1.

Results

Manipulation checks. A 2 (Participant's Sex) \times 2 (SP's Sex) \times 2 (Attractiveness of SP: high vs. low) ANOVA with independent measures on all factors and attractiveness ratings as dependent variable yielded the expected significant main effect for attractiveness, $F(1, 495) = 573.10$, $p < .001$, $\eta^2 = .49$. Participants rated attractive SPs as more attractive ($M = 7.16$, $SD = 1.91$) than unattractive SPs ($M = 3.44$, $SD = 1.59$).¹¹

Attributions. As in Study 1, an indicator representing the extent to which the negative outcome of the SP was attributed to internal causes was computed by calculating failure attributions to lack of ability minus attributions to bad luck. Analyses yielded the predicted three-way Sex of Participant \times Sex of SP \times Attractiveness of SP interaction, $F(1, 497) = 7.14$, $p < .01$, $\eta^2 = .01$ (see Figure 5).¹² Separate analyses for the sexes revealed that males attributed failure slightly more to internal causes for attractive male SPs ($M = -0.52$, $SD = 3.32$) than unattractive male SPs ($M = -1.10$, $SD = 4.00$), $t(96) = -0.79$, $p = .43$, *ns*; while they ascribed failure more to external causes for attractive females ($M = -2.28$, $SD = 3.69$) than for unattractive females ($M = -0.15$, $SD = 3.54$), $t(112) = 3.13$, $p < .01$, $F(1, 208) = 7.29$, $p < .01$, $\eta^2 = .03$. This pattern was reversed for female participants who ascribed the unsuccessful outcome of an attractive male SP ($M = -2.74$, $SD = 3.46$) less to internal causes than the failure of an unattractive male SP ($M = -0.86$, $SD = 3.87$), $t(154) = 3.21$, $p < .01$; and the negative outcome of an attractive female ($M = -0.92$, $SD = 3.50$) more to internal causes than that of an unattractive female SP ($M = -1.30$, $SD = 10.24$), $t(135) = -0.28$, $p = .78$, *ns*, $F(1, 289) = 2.59$, $p = .11$, *ns*. Consequently, the hypothesis that the SAB would continue to persist in a scenario in which the SP experiences failure was confirmed.

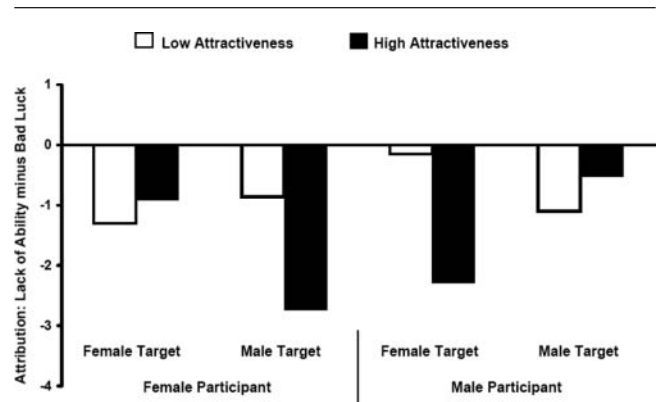


Figure 5 Attributions of failure to internal causes (i.e., lack of ability minus bad luck) as a function of participants' gender and stimulus persons' attractiveness and gender.

When comparing the effect sizes of the three-way interactions obtained using the same factorial design in Study 1 and Study 2, it becomes evident that the effect is mitigated in the context of failure of the SP ($\eta^2 = .11$ in the success scenario, attributions to ability minus luck vs. $\eta^2 = .01$ in the failure scenario, attributions to lack of ability minus bad luck).¹³

Positive emotional response toward the SP. Subsequently, a 2 (Respondent's Sex) \times 2 (SP's Sex) \times 2 (Attractiveness of SP: high vs. low) independent measures ANOVA was conducted for positive emotional response. Analysis yielded a significant three-way Sex of Participant \times Sex of SP \times Attractiveness of SP interaction, $F(1, 497) = 22.30$, $p < .001$, $\eta^2 = .04$ (see Figure 6).¹⁴ This effect is almost equal in size to that obtained in Study 1. Men reported slightly less positive emotions toward an attractive male SP ($M = 4.59$, $SD = 1.59$) than toward an unattractive male SP ($M = 4.80$, $SD = 1.88$), $t(96) = 0.60$, *ns*; while they had more positive feelings toward an attractive female SP ($M = 6.11$, $SD = 1.53$) than toward an unattractive female SP ($M = 4.60$, $SD = 1.61$), $t(112) = -5.16$, $p < .001$, $F(1, 208) = 14.48$, $p < .001$, $\eta^2 = .06$. This pattern was reversed for the emotions indicated by female participants: Their reactions were more positive toward attractive ($M = 5.43$, $SD = 1.64$) than toward unattractive men ($M = 4.66$, $SD = 1.53$), $t(155) = -3.05$, $p < .01$; while they felt less positive toward an attractive female ($M = 5.21$, $SD = 1.62$) than toward an unattractive female SP ($M = 5.46$, $SD = 1.55$), $t(134) = 0.93$, *ns*, $F(1, 289) = 7.62$, $p < .01$, $\eta^2 = .03$. This response pattern for positive emotions toward the SP in a failure context is congruent with the results obtained in a success scenario.

Negative emotional response toward the SP. With regard to negative emotions, no significant three-way interaction was obtained, $F(1, 497) = 0.16$, *ns*.

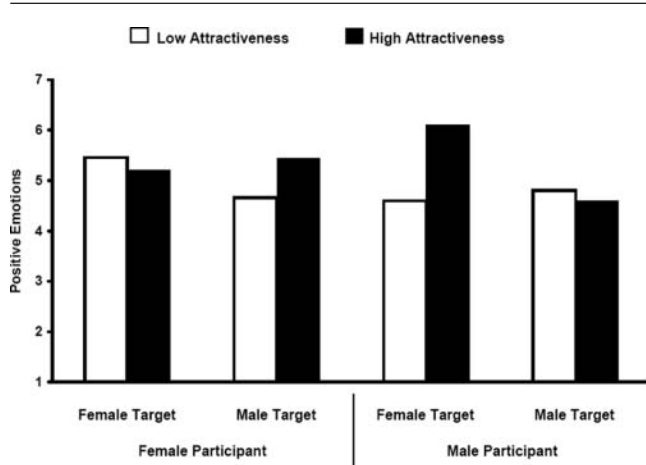


Figure 6 Positive emotions toward an unsuccessful stimulus person according to participants' gender and stimulus persons' attractiveness and gender.

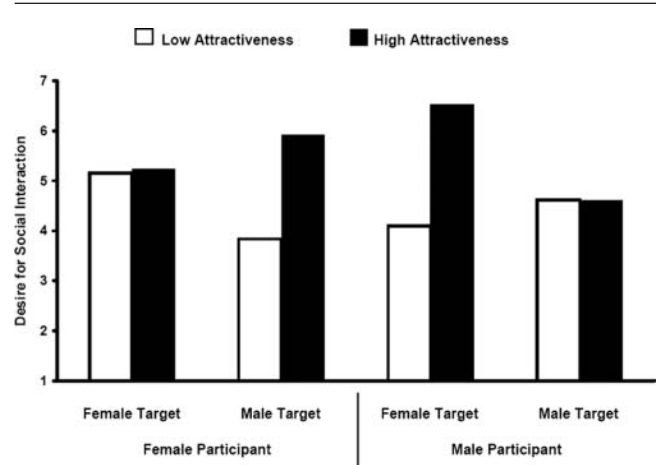


Figure 7 Desire for social interaction with an unsuccessful stimulus person according to participants' gender and stimulus persons' attractiveness and gender.

Desire for social interaction with the SP. Finally, a significant three-way Sex of Participant \times Sex of SP \times Attractiveness of SP interaction was obtained with regard to the desire for social interaction with the SP: $F(1, 496) = 40.40, p < .001, \eta^2 = .07$ (see Figure 7).¹⁵ This effect was slightly smaller than that found in the success scenario of Study 1.

Separate ANOVAs for the sexes revealed that male participants were slightly less inclined to want to socially interact with attractive male SPs ($M = 4.61, SD = 2.01$) than with unattractive male SPs ($M = 4.42, SD = 1.60$), $t(96) = 0.60, ns$; while they favored social interaction with an attractive female SP ($M = 6.53, SD = 1.60$) as compared with an unattractive female ($M = 4.10, SD = 1.81$), $t(112) = -5.16, p < .001, F(1, 206) = 21.03, p < .001, \eta^2 = .08$. Analogously, female participants indicated a stronger inclination to socially interact with attractive male SPs ($M = 5.92, SD = 1.96$) than with unattractive male SPs ($M = 3.84, SD = 1.63$), $t(155) = -3.05, p < .01$. Regarding imagined encounters with other females, however, they did not show a significant preference for either attractive or unattractive SPs: In the failure scenario, female participants did not rate social contact with attractive same-sex SPs as potential rivals ($M = 5.23, SD = 2.13$) as being more undesirable than interaction with unattractive same-sex SPs ($M = 5.15, SD = 1.87$), $t(134) = 0.93, ns, F(1, 290) = 20.48, p < .001, \eta^2 = .06$.

Discussion

The hypothesis that the SAB and analogous attractiveness-gender biases in emotions and social interaction intentions would persist, though to a diminished

degree, in a scenario in which the SP experiences failure was confirmed: Concerning attributions and based on the indicator variable lack of ability minus bad luck, significant though reduced effects were found in line with the SAB.

Analogously, the biased response pattern (in particular the derogation component) was evident though mitigated with regard to the desire for social interaction and failed to emerge in connection with negative emotions (which may result from social desirability tendencies leading people to suppress or at least to not report negative emotions toward a person experiencing failure).

It was thus confirmed that the threat posed to individuals by potential rivals with a higher level of physical attractiveness is mitigated when this person's superiority is counterbalanced by a domain in which the SP is unsuccessful. Hence, it might be assumed that the SAB is sensitive to contextual variables in connection with social comparison. This may apply not only to the intrasexual competition (i.e., derogation) component of the SAB but also to the glorification component: The finding of a less prominent bias in the failure scenario might imply that unsuccessful opposite-sex individuals are no longer as interesting to respondents as those who are successful, despite undiminished physical attractiveness. The fact that the biased response pattern continued to emerge in spite of a reduction of glorification or derogation motives on the part of the raters demonstrates the robustness of the phenomenon. Moreover, the observation that the bias in positive emotions was not reduced in the failure scenario may suggest that biased responses continue to emerge when response variables allow for glorifying or derogatory tendencies that are more subtle (e.g., in comparison to negative emotions).

GENERAL DISCUSSION

The present two studies aimed to complement and extend previous research on the SAB (Försterling et al., 2007) that has demonstrated that people in their 20s often attribute the success of same-aged, same-sex attractive SPs in a more derogative way than the success of less attractive persons, whereas this pattern is reversed for individuals of the opposite sex. These findings have been interpreted as reflecting mating motivation and intrasexual competition.

The article also addressed previously unexplored questions concerning whether this bias is limited to attribution or whether it can also be found in the domains of emotion and desire for social interaction. Furthermore, Study 2 employed failure attributions instead of success attributions in order to investigate whether the bias would persist when contextual variables were changed (i.e., scenario of SP's success vs. SP's failure).

Summarizing the findings of the two studies, failure attributions, emotions, and the desire for social interaction all displayed response patterns corresponding to the SAB: The outcomes of same-aged, same-sex attractive SPs were explained in a more derogative way than those of less attractive same-sex persons; participants reported less positive feelings toward them and indicated less inclination toward socially interacting with these physically attractive same-sex individuals as potential rivals. This multidimensional (i.e., with respect to cognitions, emotions, and behavioral tendencies) reaction pattern was reversed for SPs of the opposite sex.

In light of the finding that the SAB even persisted for failure attributions, we deduce that the threat of a successful comparison person is not a necessary prerequisite for the emergence of the SAB. Other aspects that might contribute to an explanation of the phenomenon are considerations derived from evolutionary psychology emphasizing the potential threat of a higher physical attractiveness of a same-sex rival; this variable was identical in both the success and in the failure scenario.

The SAB response pattern appears to be consistent with the assumption that biases in social information processing are linked to fundamental adaptive motivations (Maner et al., 2003), a point that is also accentuated in error management theory (Haselton & Nettle, 2006). Moreover, the SAB response pattern is more congruent with the notion that the human mind is designed for fitness maximization as found in error management theory than with a general attractiveness effect along the lines of a "what is beautiful is good" stereotype (e.g., Langlois et al., 2000). The SAB response pattern seems to be adaptive, allowing individuals who feel threatened by an attractive same-sex person as a potential rival to change

the way in which they interpret information so as to protect and maintain self-esteem by restoring a more favorable image of themselves. This in turn may foster the persistent pursuit of mating attempts. Moreover, biased processing in the form of glorification with regard to desirable opposite-sex individuals is also assumed to contribute toward evolutionarily rewarding partnerships.

The observed SAB pattern is also in line with the considerations of Neuberg, Kenrick, Maner, and Schaller (2003), who suggested that self-protection and mating goals may influence attention to, perception of, and cognitions about individuals who differ in gender and physical attractiveness. They presume that individuals who are concerned with self-protection and mating should be biased toward perceiving others as either potential threats or potential mates. Given the central roles of survival and sexual reproduction in evolutionary processes, these motives (as well as associated affective responses), which may be activated without explicit conscious awareness (e.g., Bargh, 1990; Bargh & Chartrand, 1999; Scott, 1980), might direct attention and lead to social-cognitive consequences that facilitate potentially adaptive behavioral responses in all kinds of interpersonal situations.

Potential moderators of this bias are likely to be found in connection with the evaluating person. For instance, his or her own attractiveness probably influences the strength of the effect: It may be assumed that unattractive persons are particularly prone to derogative same-sex evaluations, whereas highly attractive persons probably do not feel threatened by a larger number of attractively inferior same-sex targets and therefore exhibit only a reduced bias (cf. Buunk, Massar, & Dijkstra, 2007; Pillsworth & Haselton, 2006).

These results relating to the SAB phenomenon appear to have some interesting implications for everyday life, not only with respect to social cognition but also for emotion and social interaction. The bias might be especially relevant in areas such as job interviews, the awarding of scholarships, or the assessment of employees, as well as to any other kind of situation in which an individual is responsible for the evaluation of another person.

Moreover, the biased response pattern might also influence highly important social issues such as help giving. The literature indicates, for instance, that men are significantly more likely to help women than other men (cf. Eagly & Crowley, 1986). It would seem reasonable to assume that the increased probability of a man helping a woman as compared with a man helping a man might also be partially shaped by the multidimensional response pattern found in our research; an even higher probability of males helping attractive females and a reduced probability of males helping unattractive females would

accordingly be expected. Analogously, the attractiveness-gender bias might also have a profound impact on such important issues as teamwork or friendships. It would thus appear interesting and necessary for future research to examine the occurrence of the bias in real-life settings.

NOTES

1. Since the application of prepubertal stimulus persons and the investigation of homosexual participants is not further addressed in the article at hand, it should briefly be mentioned that the disappearance of the sexual attribution bias (SAB) with respect to prepubertal stimulus persons might well be amplified by the fact that these individuals only rarely represent objects of social comparison for adults (which again is consistent with an evolutionary line of reasoning). With regard to the results generated in a homosexual sample, it should be noted that in this case, members of the same sex can represent both mates and rivals, as a result of which clear predictions in terms of the SAB pattern may prove difficult. However, it may be more functional for homosexual men to generally perceive an attractive same-sex individual as a mate rather than a rival: The majority of heterosexual same-sex individuals are more likely to become a sexual partner than an active rival for a third homosexual man—approximately 1% of sexually experienced heterosexual college students have had same-gender sex partners (Ellis, Robb, & Burke, 2005). The biased response pattern found by Försterling, Preikschas, and Agthe (2007; Experiment 3) in the sample of homosexual men thus appears to corroborate the evolutionary-based assumption that mating motivation largely contributes to the emergence of the SAB.

2. For the purpose of ensuring realism, we excluded the most and the least attractive photographs. Abramowitz and O'Grady (1991) further argued that an extreme range between high and low levels of attractiveness may decrease the possibility of uncovering interaction effects. Photographs resulting in ratings with comparatively large standard deviations were also discarded.

3. The use of small black-and-white photographs was designed to decrease the saliency of the attractiveness cue.

4. Due to restricted space, it would not have been possible to individually report results for all variables. We therefore restrict our presentation of results to these scales. Results for all single items resemble the overall pattern reported and are obtainable on request.

5. There was no significant difference between the three picture sets.

6. Significant analogous three-way interactions were also found for each of the three picture sets: Picture Set 1, $F(1, 134) = 44.28, p < .001, \eta^2 = .24$; Picture Set 2, $F(1, 89) = 16.44, p < .001, \eta^2 = .14$; Picture Set 3, $F(1, 172) = 7.37, p < .01, \eta^2 = .04$. No significant differences were found with regard to the three different picture sets.

7. (Marginally) significant analogous three-way interactions were also found for each of the three picture sets: Picture Set 1, $F(1, 133) = 7.72, p < .01, \eta^2 = .05$; Picture Set 2, $F(1, 89) = 3.73, p = .057, \eta^2 = .04$; Picture Set 3, $F(1, 169) = 3.83, p = .052, \eta^2 = .02$. No significant differences were found with regard to the three different picture sets.

8. An analogous three-way interaction was only found for the third picture set, $F(1, 170) = 9.33, p < .01, \eta^2 = .05$; while the three-way interactions for the remaining two picture sets did not reach significance.

9. This might result from social desirability tendencies to not report negative feelings.

10. Significant analogous three-way interactions were also found for each of the three picture sets: Picture Set 1, $F(1, 134) = 14.21, p < .001, \eta^2 = .09$; Picture Set 2, $F(1, 89) = 9.46, p < .01, \eta^2 = .09$; Picture Set 3, $F(1, 168) = 39.58, p < .001, \eta^2 = .16$.

11. There was a significant difference between the three picture sets: The stimulus persons (SPs) of the third picture set were rated as being significantly more attractive than the SPs of the other two picture sets, $F(2, 479) = 13.66, p < .001, \eta^2 = .02$.

12. An analogous significant three-way interaction was only obtained for the first picture set, $F(1, 133) = 6.88, p < .01, \eta^2 = .05$, while the three-way interaction did not reach significance for the remaining two picture sets.

13. A closer look at the separate failure attributions revealed that the significant three-way Sex of Participant \times Sex of SP \times Attractiveness of SP interaction consistent with the response pattern of the SAB was only found for the variable bad luck, $F(1, 499) = 22.54, p < .001, \eta^2 = .04$; while no significant effects were obtained with regard to lack of ability, $F(1, 498) = 0.16, ns$.

14. Significant analogous three-way interactions were also found for each of the three picture sets: Picture Set 1, $F(1, 133) = 7.72, p < .01, \eta^2 = .05$; Picture Set 2, $F(1, 89) = 3.73, p = .057, \eta^2 = .04$; Picture Set 3, $F(1, 169) = 3.83, p = .052, \eta^2 = .02$. No significant differences were found with regard to the three different picture sets.

15. Significant analogous three-way interactions were also found for each of the three picture sets: Picture Set 1, $F(1, 130) = 7.92, p < .01, \eta^2 = .05$; Picture Set 2, $F(1, 159) = 6.42, p < .05, \eta^2 = .03$; Picture Set 3, $F(1, 191) = 31.73, p < .001, \eta^2 = .13$.

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