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An Evolutionary Perspective on Humor: Sexual Selection or Interest Indication?

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Are people who are funny more attractive? Or does being attractive lead people to be seen as funnier? The answer may depend on the underlying evolutionary function of humor. While humor has been proposed to signal "good genes," the authors propose that humor also functions to indicate interest in social relationships—in initiating new relationships and in monitoring existing ones. Consistent with this interest indicator model, across three studies both sexes were more likely to initiate humor and to respond more positively and consider the other person to be funny when initially attracted to that person. The findings support that humor dynamics—and not just humor displays—influence romantic chemistry for both men and women, suggesting that humor can ultimately function as a strategy to initiate and monitor social relationships.

Keywords: *humor; evolution; evolutionary psychology; sexual selection; relationships; speed dating*

The existence of humor is somewhat puzzling from an evolutionary perspective. On one hand, people may attempt jokes simply because they can, meaning that the ability to produce and understand humor may

be a by-product of large brains and general intelligence. Yet humor is pervasive across all cultures and plays a large role in our everyday lives. Whether we are going to the movies, interacting with a stranger or a friend, or looking for a potential romantic partner, we seek and rapidly notice humor.

When considering potential mates for example, sense of humor is a highly desirable characteristic to both sexes (e.g., Feingold, 1992; Hewitt, 1958; Li, Bailey, Kenrick, & Linsenmeier, 2002; Sprecher & Regan, 2002). From a list of 101 different attraction tactics, "displayed a good sense of humor" was rated by men and women as the most effective tactic for attracting mates (Buss, 1988, Study 2). At least one popular press book also offers the following advice to men on flirting: "Remember this: You want to make women laugh. If you can make a woman laugh . . . she'll want to see you again" (Louis & Copeland, 1998, p. 145).

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But why did humans apparently evolve to have humor specifically be so important in courtship and almost any kind of social relationship? One evolutionary perspective suggests that humor is important because displays of humor are effectively displays of mate quality. That is, an ability to produce humor might reflect one's underlying intelligence and genetic quality (Miller, 1998, 2000a). Although being humorous may be attractive because it signals genetic quality, we suggest it is also important to consider how being attractive for a relationship may lead one to be seen as more humorous. In the current article, we propose and examine an "interest indicator" model whereby humor (behavior intended to amuse or draw laughter) functions to communicate interest in a potential or existing relationship. One prediction made by this theoretical model is that whether humor exchange occurs—and how successful the exchange is—should depend on whether there is underlying attraction between two individuals in the first place. More broadly, the interest indicator model proposes that humor is inherently different from intelligent conversation and serves an important function beyond courtship or intra-sexual competition. Because the interest indicator model is offered as an ultimate explanation of humor, we compared this model to a sexual selection model, which offers an alternative evolutionary view, rather than to other humor theories that offer more proximate explanations.

Sexual Selection: Humor Is Attractive

The idea that humor may be attractive as a signal of genetic quality is rooted in Darwin's (1871) sexual selection theory, which has explained the presence of ornamental traits in animal species, including the peacock's intricate tail. Such features increase reproductive fitness not by directly conferring survival advantages but by increasing the ability to attract mates. Many sexually selected traits are thought to be markers of good underlying genes (Andersson, 1994). That is, because a peacock's tail is difficult to produce and costly to maintain, differences in aesthetic quality among tails may reflect differences in underlying genetic quality among peacocks (Loyau, Saint Jalme, Cagniant, & Sorci, 2005; Møller & Petrie, 2002; Zahavi & Zahavi, 1997). Accordingly, peahens that choose to mate with peacocks having attractive tails confer heritable benefits to their offspring.

More recently, theories of sexual selection and good genes have been invoked to explain the existence of and attraction to various human traits and behaviors (e.g., Feist, 2001; Griskevicius, Cialdini, & Kenrick, 2006; Griskevicius et al., 2007; Griskevicius et al., in press; Haselton & Miller, 2006; Miller, 1998, 2000a, 2000b, 2001). According to such theories, aesthetically judged

qualities such as musical talent, humor, and creativity involve complex cognitive functions that require successful resistance to mutations and parasites during development. As such, these qualities may have been sexually selected and are attractive because they indicate cognitive competence and underlying genetic fitness (Miller, 1998, 2000a).

In most species, females bear greater reproductive costs than males do and face heavier consequences for copulating with low-quality mates. Thus, it is more common for males to compete for the attention of females who are choosy rather than the other way around. As such, empirical work drawing on sexual selection theory has tended to focus on male displays for female evaluation during mate selection. For instance, survey research has found that whereas women tend to favor humor producers in potential mates, men tend to favor humor appreciators (Bressler, Martin, & Balshine, 2006). In particular, women prefer mates who make good displays that "make me laugh," whereas men prefer mates who evaluate them positively and "laugh at what I say" (Li & Kenrick, 1999). When placing personal ads, women are more likely to seek partners with a good sense of humor and the ability to make the women laugh, whereas men more often offer a good sense of humor to potential partners (Provine, 2000). Thus, displaying humor may increase a man's desirability but not a woman's. Whereas men who produce humor are rated by women as more desirable as a relationship partner, women who produce humor are not considered by men to be more desirable (Bressler & Balshine, 2006; Lundy, Tan, & Cunningham, 1998). Such findings are consistent with sexual selection theory; however, there are reasons to believe that humor has underlying functions beyond men's signaling of cognitive capacity to potential mates.

First, in the studies where women rated men who used humor to be more desirable for relationships (Bressler & Balshine, 2006; Lundy et al., 1998), women also rated the humorists as *less* intelligent than nonhumorous men. This finding indicates that humor can be desirable apart from whether it indicates intelligence to an audience. Second, in the Lundy et al. (1998) study, while women rated men who used humor to answer interview questions as more desirable for relationships than men who did not, this was only true for physically attractive men, suggesting that the effectiveness of humor in a courtship context may depend on other factors, including underlying attraction. Third, sexual selection theories have emphasized the mate selection domain as being especially important, and empirical research has focused on male humor initiation to female evaluators within this domain. However, humor usage is prevalent between individuals in all social domains (for a comprehensive review, see Martin, 2007) and thus requires a more

comprehensive explanation. In sum, although humor may allow individuals to display “good genes” when selecting mates, multiple lines of evidence suggest there is more to the underlying functions of humor. We believe humor serves another important function: to help initiate and monitor social relationships.

*Interest Indication Model: Attraction
May Lead One to Be Seen as Funnier*

We propose that humor is exchanged between individuals in courtship and other domains to establish potential relationships or maintain existing ones. Due to discrepancies in valuing potential relationships, people need to seek clarity on their intended partners’ views of these relationships. For example, Person A may desire B as a friend or mate, but B may favor other individuals for these roles. For ongoing relationships, the relative costs and benefits underlying the relationships may change over time for each person, hence the need for ongoing assessment of the relationship. In this process of establishing new relationships and assessing existing ones, humor may allow individuals to implicitly communicate their interest and gauge the corresponding level of agreement from others. That is, by initiating humor, a person may be implicitly suggesting interest in a new or already established relationship. To the extent that the audience is also interested, they will respond positively.

Why is humor needed to implicitly convey relationship interest? Why not just describe interest overtly and ask for agreement? Although people can take a direct approach, there are reasons why a more indirect approach might be advantageous and thus adaptive. First, there may not be enough information to make an outright commitment to or rejection of a relationship. For instance, when individuals initially meet, it may be unclear to either side whether the other person would make a good romantic partner, friend, or coalitional ally. Similarly, partnered individuals who are losing interest in each other may not be ready to abruptly end a relationship. As such, humor may allow individuals to indicate the direction of their interest and to build (or deconstruct) relationships incrementally.

Second, because an indication of interest conveys much less information than an evaluation of a full relationship, the costs of being rejected for an indication should be lower. Such costs include future possibilities for the relationship and one’s reputation. For example, if a man asks a woman up front for a relationship but is rejected, this particular door may be closed and his reputation and ability to attract other mates may suffer. In contrast, humor initiation may yield an indication of interest without incurring such consequences.

Third, by using humor, one can gauge the strength of a potential or existing relationship without revealing his

or her ultimate motives, which may extend beyond the establishment of a relationship. For example, if one needs to confide in and elicit the assistance of someone concerning an important matter, he or she may wish to first assess the strength of various relationships before choosing who.

The interest indicator model is consistent with literature emphasizing laughter’s function of communicating mirth (Weisfeld, 1993). Human laughter is thought to be related to the chirping noises that rats make (Panksepp & Burgdorf, 2003) and the open-mouth expressions and panting grunts that primates make during play or tickling (e.g., Goodall, 1968; Van Hooff, 1976). In response to others’ physical activity (e.g., tickling), individuals display such signals to communicate pleasure and to encourage the initiator to continue (Harris, 1999; Provine, 2000; Weisfeld, 1993). At some point, the function of laughter may have been co-opted to expand its original purpose of expressing physical pleasure to more broadly communicating pleasure in various social situations (Alexander, 1986; Caron, 2002; McGhee, 1979; Porteous, 1988; Van Hooff, 1976). Furthermore, through the co-evolution of laughter and language, humor initiation and appreciation may have emerged as a way for individuals to initiate and maintain different social relationships.

*Differences Between Interest Indicator
and Sexual Selection Models*

Considering that a good-genes sexual selection perspective and the interest indicator model both address the underlying function(s) of humor, it is important to note key differences between these two views and thus, what the interest indicator model potentially adds. Differences exist in at least four dimensions:

1. **Function:** According to the sexual selection perspective, humor primarily serves a showing-off function; according to the interest indicator model, humor is used to communicate relationship interest. Thus, whereas sexual selection suggests that humor causes attraction to occur, interest indication predicts that humor initiation and perceptions of humor are driven *by* attraction. Consistent with the interest indicator model, the same exact joke can be perceived as highly funny or unamusing depending on who tells the joke.
2. **Differentiation from general conversation:** Because a good-genes model emphasizes the conveying of intelligence, it does not necessarily differentiate between humor and general, intelligent conversation (i.e., both should be able to highlight cognitive skills). In contrast, the interest indicator model points to the specific function of humor to communicate interest. That is, although saying something creative or intelligent might be a way of showing off to a potential mate, saying something humorous should specifically convey relationship interest.

3. Direction of discourse: Research adopting a sexual selection perspective has emphasized the importance of men initiating humor and women responding (e.g., Bressler et al., 2006). In contrast, an interest indicator model emphasizes that any individual who is interested in a relationship should be more likely to initiate and respond positively to humor.
4. Scope: Whereas sexual selection theory states that humor evolved in the courtship domain and thus emphasizes humor's function in mate choice, the interest indicator model applies equally to humor's function across all social domains. That is, just as people use and desire humor not only in courtship, but across all types of social relationships and across the different stages of those relationships, the interest indicator account provides an underlying framework for how humor functions across diverse social relationships.

In summary, the interest indicator model of humor makes multiple explicit predictions about how, when, and why humor should be used and be perceived by others, and these predictions differ from those derived from a good-genes sexual selection view.

The Current Research

The overall goal of the current research was to provide insight into the ultimate function of humor. To this end, the interest indicator model is proposed as a possible explanation. We focused not on performing an exhaustive test of this model but rather on examining particular aspects of the model in an area that has an alternative ultimate explanation. Specifically, we investigated four questions for which the interest indicator model tends to make different predictions than a good-genes sexual selection perspective: (a) Does humor lead to attraction or does attraction lead to humor exchange? (b) Is interest in a relationship conveyed more clearly by humor than by general intelligent conversation? (c) Do both men and women find humor initiation and appreciation to be important in their communication of interest? (d) Do the same humor dynamics exist in social domains outside of courtship? To address these inquiries, Study 1 used a survey format, Study 2 was an online dating experiment, and Study 3 used a behavioral-observation paradigm.

STUDY 1

We examined people's initiation of interaction and their responses to another person's humor and tested two hypotheses about humor's function derived from the interest indicator model. First, whereas sexual selection research emphasizes men's initiation of humor to women in the courtship domain, the interest indicator model

predicts that both sexes are more likely to initiate and respond positively to humor not only when interested in potential relationships (courtship) but also when desiring to maintain existing relationships. Second, whereas a sexual selection account does not necessarily differentiate between humor and general, intelligent conversation, the interest indicator model predicts that initiation of humor specifically, rather than general conversation, should depend on whether individuals are romantically attracted to a potential mate or satisfied with an ongoing relationship.

Method

Participants. Participants were 46 undergraduates at a large Southwestern university. There were 26 women ($M = 19.12$, $SD = 0.43$) and 20 men ($M = 20.05$, $SD = 2.01$).

Design and procedure. Within-subject variables were domain (courtship, long-term relationship), interest (attracted/satisfied, not attracted/satisfied), and interaction type (conversation, humor). Participant sex (male, female) was a between-subjects variable. Each participant answered questions under four different scenarios. We asked them to "imagine that you meet someone new in person, and you feel romantically attracted to them" (courtship, attracted condition) and to "imagine . . . you are not romantically attracted to them" (courtship, unattracted). We also asked participants to "imagine interacting with your current long-term romantic relationship partner" (or, if not applicable, to "imagine being in a long-term romantic relationship and interacting with your partner") and "you feel satisfied with the relationship" (relationship, satisfied condition) and "imagine . . . you feel unsatisfied with the relationship" (relationship, unsatisfied). For each of these four (counterbalanced) scenarios, participants answered the following questions using a 9-point scale (1 = *extremely unlikely*, 9 = *extremely likely*):

1. "How likely would you be to initiate some general conversation?"
2. "How likely would you be to initiate some humor?"
3. "If the other person initiated humor, how likely would you laugh?"
4. "If the other person initiated humor, how likely would you consider the other person to be funny?"

Responses to Questions 3 and 4 were combined into a positive-reaction composite for the attracted-to-other-person ($\alpha = .77$) and not-attracted-to-other-person ($\alpha = .90$) courtship scenarios and the satisfied ($\alpha = .90$) and unsatisfied ($\alpha = .92$) relationship scenarios.

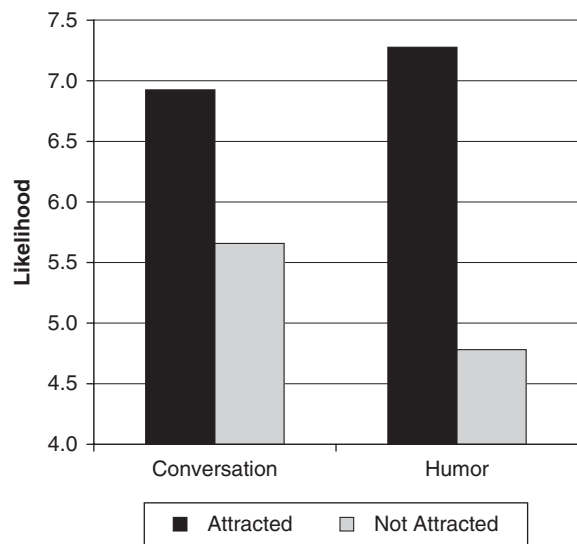


Figure 1 Likelihood of initiating conversation and humor based on attraction.

Results

Initiation of interaction based on relationship interest. An analysis of variance (ANOVA) on conversation and humor initiation produced an Interaction Type \times Interest interaction, $F(1, 44) = 38.29, p < .001, r = .68$. As Figure 1 indicates, initiation of humor depended more on attraction and satisfaction than did general conversation. That is, when not attracted or satisfied, people reported being *less* likely to initiate humor ($M = 4.78, SD = 1.49$) than general conversation ($M = 5.66, SD = 1.49$), $F(1, 45) = 24.00, p < .001$. However, when attracted or satisfied, people reported being *more* likely to initiate humor ($M = 7.28, SD = 1.21$) than conversation ($M = 6.92, SD = 1.61$), $F(1, 45) = 12.83, p < .001$. This interaction did not differ by sex, $F(1, 44) = 0.74$. This specific pattern of findings suggests that there is something particular about initiating humor, relative to general conversation, that indicates one's interest in a relationship. The findings also indicate that humor initiation functions similarly for both sexes in both courtship and existing relationships—men and women were especially likely to initiate humor when romantically attracted to a potential mate or satisfied with an existing relationship partner.

Response to other's humor initiation. We also analyzed the likelihood that a positive reaction would occur in response to another person's humor initiation. An ANOVA produced a Domain \times Interest interaction, $F(1, 44) = 57.68, p < .001, r = .75$, as people indicated

that they would react more positively to a potential mate's humor if they were romantically attracted ($M = 7.00, SD = 1.02$) than not attracted ($M = 6.22, SD = 1.14$) and even more positively to a relationship partner's humor if they were satisfied with the relationship ($M = 7.41, SD = 0.99$) than not satisfied ($M = 4.62, SD = 1.83$). This applied to both sexes, though relative to one another, men's response to humor in courtship depended more on being attracted than did women's, whereas women's responses to humor in existing relationships depended more on being satisfied, $F(1, 44) = 6.68, p = .013$.

Discussion

We found that for both sexes, humorous interchange may function distinctly from general conversation as an interest indicator in two social domains—in courtship and in an established relationship. When romantically attracted to someone new or when satisfied with an ongoing relationship, both sexes reported being more likely to initiate humor than general conversation; however, when not attracted or not satisfied, both sexes reported being less likely to initiate humor than conversation. Put another way, whereas people were somewhat more likely to initiate conversation when attracted or satisfied than when not attracted or satisfied, they were especially more likely to initiate humor when attracted/satisfied versus not attracted/satisfied. Also consistent with an interest indicator model of humor, both sexes' positive responses to humor depended on being romantically attracted in a courtship situation and even more on being satisfied with a long-term relationship partner. In courtship, men's responses depended more on being attracted than did women's, whereas in existing relationships, women's responses depended more on being satisfied than did men's.

STUDY 2

Study 1 suggested that people may initiate and respond positively to humor specifically to show interest when they are romantically attracted to that person and when they are in a good relationship with that person. To experimentally investigate the interest indicator model's hypothesized causal relationship between romantic attraction and humor, we designed Study 2 to test if one's initial attraction toward a potential mate predicts how humorous one finds that potential mate when the mate introduces himself. We were especially interested in testing this hypothesis because whereas a sexual selection perspective suggests that humor should lead an individual to be more desirable, an interest indicator model predicts that desirability should lead a person to be seen as funnier.

Method

Participants. Participants were 92 women, aged 16 to 53 ($M = 23.2$, $SD = 7.4$), and 51 men, aged 18 to 55 ($M = 23.2$, $SD = 8.6$). Participants were recruited from a www.facebook.com advertisement ($n = 116$) and from the introductory psychology pool at a large Southwestern university ($n = 27$; analyses did not differ when this smaller group was excluded).

Design and procedure. Participant sex (male, female) was a between-subject variable and target choice (first, last) was a within-subject variable.¹ Participants were presented with a mock Internet dating Web site with these instructions:

Researchers in the psychology department who study attraction and mating are setting up an online dating site for students to meet each other as an alternative to the bar and party scene. We would like your help in reviewing some of the people who have thus far put up profiles.

Participants were presented with a Web page simultaneously displaying headshot photos of four candidates of the sex to which they indicated attraction (opposite sex for all but 3 participants). The photos were selected from a photo database of college-aged individuals, where each photo was pre-rated for physical attractiveness (1 = *extremely unattractive*, 9 = *extremely attractive*) by 16 undergraduates. Each participant saw two candidates with relatively attractive photos (females: $M_s = 7.44, 7.63$; males: $M_s = 7.09, 7.47$) and two candidates with relatively unattractive photos (females: $M_s = 2.58, 2.69$; males: $M_s = 2.53, 2.80$).

Each target was then presented individually with the headshot photo and some filler information (e.g., horoscope sign, favorite music, favorite color). All target photos were then simultaneously presented on one page again. On that page, participants indicated how attracted they are to each candidate (1 = *not very*, 9 = *extremely*) and ranked the candidates in order of preference as a long- or short-term romantic partner (counterbalanced).

Participants were then told that thus far, two candidates had recorded audio introductions that they could listen to. In actuality, four different introduction dialogues were prerecorded by two men and two women. Each introduction was similar in length (2 minutes) and style and contained three attempts at humor (e.g., "I am a fun loving, caring person who is unique—just like everyone else"). An audio recording from one of the two men or one of the two women (depending on the sex that a participant indicated attraction to) was randomly paired with each participant's first-choice candidate, and another audio recording from the other man

or woman was randomly paired with each participant's fourth-choice candidate. For example, if the first-choice candidate was randomly paired with recording 3 from male-voice 2, then the fourth-choice candidate was randomly paired with recording 1, 2, or 4 from male-voice 1. We used the first- and fourth-choice candidates to maximize any difference in preference.

Measures. Participants then viewed their first- and fourth-choice candidates (counterbalanced) on separate Web pages, each with an audio introduction. Subsequently, participants answered various postaudio questions pertaining to each of these two candidates, using a 9-point scale (1 = *not very*, 9 = *extremely*). Among these questions were items pertaining to key variables: "How funny (humorous) am I?" "Do I have a good sense of humor?" and "How attracted are you to me?" Because emotional warmth is a key dimension in mate preferences (Fletcher, Tither, O'Loughlin, Friesen, & Overall, 2004) and emotionality can come across in speech, we also included items to see if judgments of humor and attraction might be due to differences in emotionality and warmth: "How emotionally expressive am I?" and "Would I be a warm person to others?" Responses on the two humor questions were aggregated into a within-subjects humor-reaction composite (first choice $\alpha = .87$; last choice $\alpha = .88$), and responses on the emotional expressiveness and warmth questions were aggregated into a within-subjects interpersonal-warmth composite (first-choice $\alpha = .62$; last-choice $\alpha = .81$).

Results

We used SPSS's general and mixed linear models to analyze the data. Participants' rank ordering of targets reflected the targets' physical attractiveness: 95% of participants' first-choice candidates had physically attractive faces, and 94% of participants' last choices had unattractive faces.

Does attraction lead to positive evaluations of humor?

Using the humor-reaction composite as the dependent variable, a mixed linear model revealed only an effect of target choice, $F(1, 129) = 26.02$, $p < .001$, $r = .41$. The Participant Sex \times Target Choice interaction was insignificant, $F(1, 129) = 2.26$, $p = .135$. Thus, both sexes considered their first-choice candidate to be more humorous ($M = 5.51$, $SD = 1.63$) than their last-choice candidate ($M = 4.60$, $SD = 1.77$). To examine if this was due to differences in initial attraction, we reran the analysis using the preaudio attraction ratings as a repeated measures covariate. There was only an attraction effect, $F(1, 238.20) = 18.25$, $p < .001$, $r = .27$, such

that the greater the reported attraction toward a candidate, the more positive the humor reaction, $\beta = .29$, $t(238.20) = 4.27$, $p < .001$. Target choice was no longer significant ($p = .24$). Thus, initial attraction led to positive evaluations of humor: First-choice candidates were considered to be more humorous than last-choice candidates, and this difference was attributable to the greater reported attraction toward the first-choice candidates before the audio introductions.

It is possible that the audio introductions may have provided additional information on targets' interpersonal warmth. As such, we examined whether perceptions of interpersonal warmth mediated (Baron & Kenny, 1986) the relationship between initial attraction and humor reactions. Looking at first-choice targets, the three variables were all intercorrelated, $ps < .001$. When humor reaction was regressed onto initial attraction, the coefficient was significant, $b = .47$, $SE = .10$, $p < .001$. When humor reaction was regressed onto warmth and initial attraction, the coefficients were significant for both warmth, $b = .73$, $SE = .11$, $p < .001$, and attraction, $b = .22$, $SE = .10$, $p = .027$. Although partial, this mediation was significant (Sobel test = 3.87, $p < .001$). For last-choice targets, the three variables were also all intercorrelated, $ps < .05$. When humor reaction was regressed onto warmth, the coefficient was significant, $b = .28$, $SE = .09$, $p = .003$. When humor reaction was regressed onto warmth and initial attraction, the coefficient for warmth was significant, $b = .63$, $SE = .07$, $p < .001$, but the attraction coefficient was reduced to marginal significance, $b = .15$, $SD = .08$, $p = .057$. A Sobel test (2.05, $p = .040$) indicated this mediation was significant.

Did humor affect attraction? Adding context (pre-audio, postaudio) as a within-subjects variable, we analyzed attraction for the first- and last-choice candidates using the ratings from before and after the audio introduction. The general linear model indicated that people were attracted to their first-choice candidates ($M = 7.46$, $SD = 1.37$) and unattracted to their last-choice candidates ($M = 3.05$, $SD = 1.72$), $F(1, 128) = 592.78$, $p < .001$, $r = .91$. This was true for both sexes, as the Participant Sex \times Target Choice interaction was not significant, $F(1, 128) = 3.86$, $p > .05$. A Context \times Target Choice interaction, $F(1, 128) = 62.07$, $p < .001$, $r = .57$, indicated that while attraction decreased nonsignificantly for first-choice targets (pre: $M = 7.57$, $SD = 1.30$; post: $M = 7.36$, $SD = 1.45$), $F(1, 132) = 2.33$, $p > .10$, attraction increased significantly for last-choice targets (pre: $M = 2.63$, $SD = 1.59$; post: $M = 3.47$, $SD = 1.85$), $F(1, 128) = 60.59$, $p < .001$, $r = .57$. This was true for both sexes, as the Participant Sex \times Context \times Target Choice interaction was not significant, $F(1, 128) = .035$.

With the warmth composite as a covariate, the last-choice targets no longer differed on pre- and postaudio attraction, $F(1, 124) = .40$. Thus, candidates' use of humor in personal introductions did not, on average, increase attraction toward the candidates; however, people became less *unattracted* toward physically unattractive candidates to whom they initially reported the least romantic attraction.

Discussion

The experimental evidence in this study was consistent with the interest indicator model: Initial attraction to a potential romantic partner and interest in a romantic relationship with such a person (both based mostly on physical attractiveness) predicted subsequent responses to that person's humor attempts and perceptions of that person's sense of humor. Thus, being desirable led targets to be seen as funnier. Mediation analyses suggested this was in part due to increased perceptions of interpersonal warmth. That is, initial attraction toward a target also led to greater perceptions of warmth in the target's humor, which were then associated with more positive evaluations of the target's humor. Whereas a sexual selection perspective would predict that a humorous introduction should increase attraction, being funny did not make all targets more desirable. However, a humorous introduction did increase people's attraction for the targets they least preferred for romantic relationships—targets who were mostly physically unattractive. Results suggest that this may also have been related to interpersonal warmth attributed to these targets and raise the possibility that humor initiation may serve as a compensatory strategy for physically unattractive individuals.

STUDY 3

The first two studies offer initial support for the interest indicator model of humor. However, whereas Study 2's experiment focused on responses to humor, the interest indicator model also proposes that interest in a relationship should motivate humor to be initiated in the first place. To simultaneously investigate various proposed dynamics of the interest indicator model, Study 3 utilized a behavioral observation method. If humor functions as a strategy to indicate interest, then third-party observers of a conversation between potential mates should perceive the individuals to be communicating romantic interest if humor, as opposed to general conversation, is initiated and if there are positive responses to humor versus general conversation. We also examined a key prediction made by the sexual selection model—observers should perceive individuals

who initiate humor as more romantically desirable than individuals who do not initiate humor.

Method

Participants. Participants were 158 women, aged 17 to 50 ($M = 18.7$, $SD = 2.8$), and 150 men, aged 17 to 47 ($M = 19.0$, $SD = 2.7$), enrolled in introductory psychology.

Design and procedure. Participant sex (male, female), humor initiation (yes, no), and response (positive, flat) were between-subject variables, and target sex (male, female) was a within-subjects variable. Participants were briefly introduced to speed dating and told that they would watch an actual speed dating round that was recorded on video.

Sexual selection accounts of humor have tended to focus specifically on male displays of humor (e.g., Bressler et al., 2006). Because we were interested in examining the interest indicator model of humor relative to a sexual selection account, we decided to conduct this study with men (rather than women) as displayers of humor. Thus, we focused on one direction of humor exchange by controlling whether men initiated humor and whether women responded favorably.

To construct the recordings, we employed a film industry writer to write four speed dating scripts. In each script, a man walked over to a female contestant, introduced himself, and sat down across from her. He then talked pleasantly with her, asking 9 to 10 questions over the course of a 5-minute conversation. The scripts were written to reflect a 2 (humor, no humor) \times 2 (positive response, flat response) design. In two of the scripts, the man attempted general humor throughout the conversation. In the other two scripts, the man did not explicitly attempt humor but kept up an engaging conversation. In one of the humor initiation scripts and one of the nonhumor scripts, the woman responded positively, whereas in the other two scripts the woman gave relatively flat answers. In pretesting, 14 people were instructed to rate how funny the man was in each video (1 = *not funny at all*, 7 = *very funny*), independently of the responses of the other contestant. The two humor scripts ($M_s = 5.36, 5.07$) did not differ in funniness, $F(1, 13) = 0.60$, and the two nonhumorous scripts ($M_s = 3.36, 3.21$) did not differ in funniness, $F(1, 13) = .24$. However, the humorous scripts were significantly funnier than the nonhumorous scripts, $F(1, 13) = 56.75$, $p < .001$, $r = .90$. Examples of dialogue are as follows:

Humor initiation: "You know what's great about speed dating? It's totally not awkward."

Positive response: (laughs) "Yeah, no kidding."

Humor initiation: "You know what's great about speed dating? It lets you experience all the awkwardness and embarrassment of the first date, 30 times in one evening. You gotta admit—that's a timesaver."

Flat response: "I never really thought about it that way."

Nonhumor initiation: "So, do you find speed dating to be as humiliating as I do?"

Positive response: "Oh my god yes. And the amazing thing is—we're paying for this."

Nonhumor initiation: "So, welcome to speed dating. How's it going so far? Have any good dates?"

Flat response: "Well, it's a little hard to tell when they're only 3 minutes long."

Four students (blind to hypotheses) were employed to act as the male–female pairs undergoing a speed dating round. Each of the two male–female actor pairs rehearsed extensively and recorded to video the four scripts. For all four recordings, the male actors were told to exhibit the same enthusiasm. Female actors were instructed to display the same positive enthusiasm throughout the two positive response rounds and the same flat affect for the two flat response rounds. The eight videotaped sessions (four from each pair) were converted to Windows Media Video (.wmv) files and presented on 19" monitors. Participants were presented with one of the four recordings from one of the male–female actor pairs (counterbalanced).

Measures. After viewing a recording, participants evaluated the dating round by answering questions using a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). Embedded in the questions were key items pertaining to targets' humor initiation ("The male initiated a lot of humor," "The male was trying to be funny"), interest conveyance ("The male appeared to be conveying interest to the female," "The male appeared to be conveying that he was *not* attracted to the female"—reverse-scored), interest in seeing the other contestant again ("The male will indicate on his list that he is interested in seeing this female again"), emotional expressiveness ("The male was emotionally expressive"), and conversation initiation ("The male was initiating a lot of conversation"). All these items were also asked regarding the female target. Male and female composites were made for humor initiation (male targets: $\alpha = .82$; female targets: $\alpha = .82$) and interest conveyance (male targets: $\alpha = .76$; female targets: $\alpha = .84$). Also, participants who indicated that they were generally attracted to men also rated their own view of the male targets' desirability as a potential short-term ("I found the male to be appealing as a potential sexual partner") and long-term

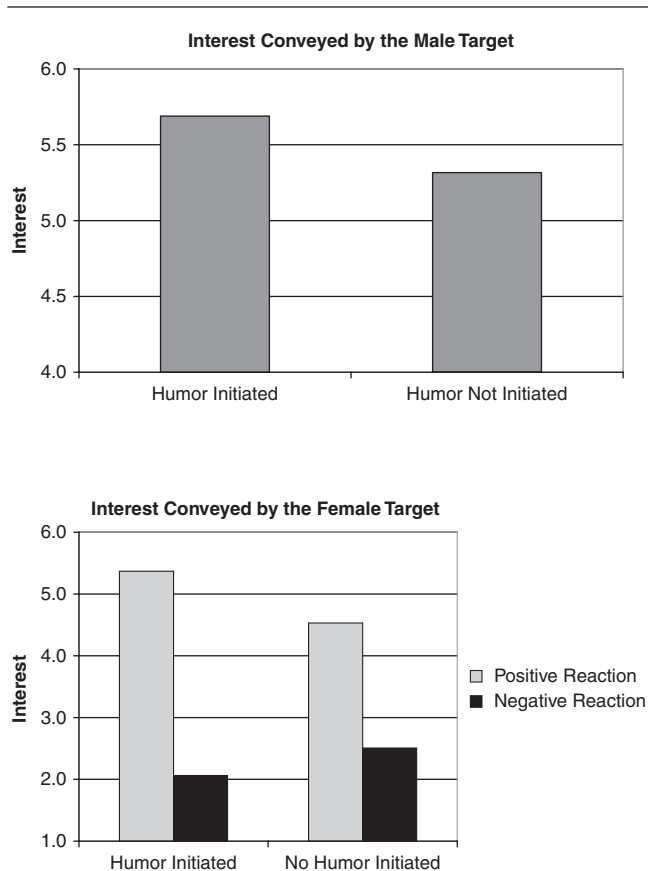


Figure 2 Interest conveyance as a function of humor initiation and reaction.

mate (“I found the male to be appealing as a potential long-term relationship partner”). These two items were combined into a male romantic desirability composite ($\alpha = .81$).

Results

Humor initiation manipulation check. An ANOVA on the humor initiation composite indicated that male targets were perceived as having initiated more humor in the humor initiation condition ($M = 5.96$, $SD = 1.11$) than in the nonhumor condition ($M = 4.02$, $SD = 1.61$), $F(1, 305) = 151.83$, $p < .001$, $r = .58$.

Conveying interest. Using the interest conveyance composite as the dependent variable, an ANOVA revealed a significant Target Sex \times Initiation \times Response interaction, $F(1, 300) = 9.75$, $p = .002$, $r = .18$. When humor was initiated, the (male) initiators were perceived as showing significantly more attraction and interest ($M = 5.69$, $SD = 1.03$) than when they initiated engaging conversation without humor ($M = 5.32$, $SD = 1.27$), $F(1, 303) = 8.37$, $p = .004$, $r = .16$. The (female)

respondents were perceived as showing more attraction and interest when they responded positively; however, this was significantly more so for humorous conversation (positive response: $M = 5.37$, $SD = 1.02$; flat response: $M = 2.06$, $SD = 1.07$) than nonhumorous conversation (positive response: $M = 4.53$, $SD = 1.14$; flat response: $M = 2.51$, $SD = 1.24$), $F(1, 303) = 20.84$, $p < .001$, $r = .25$ (see Figure 2). Thus, results support the hypothesis that humor, distinct from general intelligent conversation, conveys information about relationship interest.

We examined if interest conveyance effects were also due to perceptions that targets displayed emotionality or simply initiated conversation. First, we regressed male interest onto humor initiation, male emotional expressiveness, and male conversation initiation. Humor initiation, $\beta = .19$, $t = 3.47$, $p < .001$, and expressiveness, $\beta = .14$, $t = 2.46$, $p = .014$, were significant predictors. Next, we regressed female interest onto humor initiation, humor response, and their interaction and the male and female items for emotional expression and conversation. Coefficients were significant for male conversation, $\beta = .11$, $t = 2.61$, $p = .010$, and female conversation, $\beta = .29$, $t = 5.61$, $p < .001$. At the same time, the relationship between humor exchange and interest conveyance remained significant, $\beta(\text{Initiation} \times \text{Reaction}) = .18$, $t = 4.77$, $p < .001$.

Interest in seeing the other contestant again. In speed dating, rounds conclude with each contestant indicating whether he or she wishes to see the other person again in the future. We ran an ANOVA on the ratings for the see again question. An Initiation \times Response interaction, $F(1, 300) = 8.72$, $p = .003$, $r = .17$, indicated that targets were perceived as more likely to want to see one another again when the response condition was positive than when it was flat and that this was more so under the humor initiation condition (positive response: $M = 5.71$, $SD = 1.49$; flat response: $M = 2.52$, $SD = 0.93$) than under the nonhumorous condition (positive response: $M = 4.98$, $SD = 1.60$; flat response: $M = 2.60$, $SD = 1.36$). Thus, both male and female targets’ interest in seeing each other again depended on whether humor was initiated and whether the response to humor was positive.

We also regressed see again interest (male–female composite, $\alpha = .77$) onto humor initiation, response, and their interaction and both male and female expressiveness and conversation items. Coefficients were significant for female expressiveness, $\beta = .12$, $t = 2.41$, $p = .017$; male conversation, $\beta = .08$, $t = 2.01$, $p = .045$; and female conversation, $\beta = .25$, $t = 4.95$, $p < .001$. At the same time, perceptions that candidates’ see again interest depended on humor exchange remained significant, $\beta(\text{Initiation} \times \text{Reaction}) = .26$, $t = 3.59$, $p < .001$.

Initiator's romantic desirability. To see if female participants' own view of male targets' romantic desirability varied as a function of the male targets' initiation of humor versus general conversation and the female targets' responses, we ran an ANOVA using the male romantic desirability composite as the dependent variable. There was just a nonsignificant trend counter to what would be predicted by a sexual selection view, whereby participants ascribed lower romantic desirability to male targets who initiated humor ($M = 3.29$, $SD = 1.44$) than those who did not initiate humor ($M = 3.75$, $SD = 1.54$), $F(1, 149) = 3.40$, $p = .067$, $r = .15$.

Discussion

In this behavioral observation study, participants viewed video recordings of individuals interacting in speed dating sessions. Two key variables were experimentally manipulated: humor initiation and response. Results indicated that when a person initiated conversation with humor, he was perceived to be communicating more romantic interest than when he initiated an engaging conversation without humor. This suggests that there is something specific about initiating humor—and not just conversation in general—that indicates interest toward another person. When responding positively versus in a flat manner, the respondent was perceived to be communicating more romantic interest. However, this was especially true in response to humorous versus nonhumorous conversation, meaning that romantic interest was highest when positive responses were made to conversation containing humor attempts. In addition, both contestants at the end of the round were perceived to be most likely to want to see the other again when there were positive responses to humor in the round. These findings suggest that there is something specific about responding positively to humor—and not to conversation in general—that communicates mutual interest in a relationship. Further analyses indicated that perceptions of conversation initiation and emotional expressiveness also positively affected interest (with beta weights indicating similar magnitudes as for hypothesized dynamics) and that the hypothesized humor dynamics held after controlling for these variables. Considering that people appear to inherently recognize humor as an interest indication tool in relationships, this study supported the dynamics of humor predicted by the interest indicator model. In contrast, results did not support the sexual selection view that humor initiation increases romantic desirability. Female participants did not perceive the male targets to be more romantically desirable if the male targets initiated humor.

GENERAL DISCUSSION

The existence and underlying function of humor have always been puzzling from an evolutionary perspective. In this article, we proposed and investigated an evolutionary model—interest indication—in comparison with another evolutionary model: sexual selection. A sexual selection model suggests that humor evolved as a mating display to signal intelligence and genetic fitness (Miller, 1998, 2000, 2000a, 2000b). We suggested that humor may have another important underlying function: indicating interest in initiating new relationships (romantic or otherwise) and maintaining existing ones. Compared to the sexual selection model and research drawing on sexual selection, our model predicts that both sexes should generally initiate humor when interested in a relationship, they should do so across different social domains, humor should be seen as funnier when coming from an already desirable person, and humor is inherently different from intelligent or engaging conversation. Results across three studies supported predictions derived from this model. In Study 1, both sexes reported being more likely to initiate humor and to laugh in response to humor when they were initially attracted versus not attracted to a potential mate. Importantly, this effect remained the same outside of the courtship domain: Individuals who were already in a committed relationship initiated and responded similarly to humor.

Study 2 found experimental evidence that initial attraction and interest in a potential relationship predict judgments of humor. Specifically, both sexes considered targets to whom they had indicated greater romantic interest and attraction to be subsequently more humorous than targets to whom they had indicated less interest and attraction. In Study 3, people viewed male–female pairs interacting in speed dating sessions and indicated that they recognized the relationship dynamics of humor predicted by the interest indicator model. Expression of romantic interest as well as having interest in seeing the other contestant in the future were judged to be highest specifically when humor (vs. general, engaging conversation) was initiated and responses to humor were positive. These results held after taking into account perceptions of conversation initiation and positive emotionality among the contestants.

The findings show initial support for the interest indicator model of humor, are consistent with the possibility that humor evolved in part as an interest indication tool in social relationships, and suggest that an interest indicator model adds to an understanding of humor beyond a sexual selection model. Furthermore, results also suggest that warmth, a highly valued trait

in mate preferences (e.g., Fletcher et al., 2004), may play an important part in humor's function as an interest indicator. Mediation analyses indicated that initial attraction toward a person led to greater perceptions of interpersonal warmth from that person's humor, which were then associated with more positive reactions to the humor. One possibility is that humor initiation suggests relationship interest by signaling cooperative potential. Future research should more carefully examine this possibility.

Reconciling Between Interest Indication and Sexual Selection

Although results supported the interest indication model, they were not completely incompatible with the sexual selection model. In Study 2, humorous audio introductions led to increased attraction toward targets who were physically unattractive and least preferred for romantic relationships. Results suggested that this increased attraction may have been due to perceptions of interpersonal warmth garnered from the audio introductions. In Study 3, however, we did not find a male target's initiation of humor to increase women's perceptions of his desirability as a potential romantic relationship partner.

More generally, although empirical research on human aesthetic qualities has focused on the male display/female evaluation aspect that typifies sexual selection in nonhuman species (e.g., Bressler et al., 2006; Griskevicius et al., 2006; Griskevicius et al., 2007), theory advanced by Miller for the evolution of humor, creativity, and moral virtues proposes that these traits were sexually selected through *mutual* display and *mutual* mate choice (Hooper & Miller, 2008; Miller, 1998, 2000a, 2000b, 2007). According to this broad "fitness indicator" framework, both men and women should produce cognitively costly and socially risky indicators of their good genes through creative displays. Humor is risky because if it succeeds, it can increase attraction and comfort; however, failure, in the form of negative or flat responses that signal disinterest and cause mutual discomfort, is also possible.

Although Miller proposed that humor evolved in the mate selection domain, the need to convey fitness to others is not limited to courtship but extends to various other social domains (e.g., relationship maintenance, kin relations, coalitions). The interest indicator and fitness indicator views might be further reconciled by considering that across domains, individuals might normally indicate their fitness by simply speaking intelligently. However, in situations where displaying fitness has especially high potential sexual or social payoffs (e.g., in early courtship, maintaining a threatened sexual

relationship, soliciting help from parents, seeking a valuable same-sex ally), people can enhance their verbal creativity displays with humor. That is, there may be a higher motivational threshold for using humor than general conversation because humor has higher potential benefits and costs.

Finally, although our view is that humor is similarly valued by men and women, it is important to note that adaptive sex differences exist in various domains, and thus, humor usage should reflect those sex differences. For instance, because the potential costs to men of pursuing sexual partners are lower than to women, men are more motivated to pursue such relationships (e.g., Buss & Schmitt, 1993) and thus the ones who typically initiate humor in such settings. However, if both sexes are equally motivated to initiate or maintain a relationship (e.g., a good marriage), then humor initiation should be more balanced between the sexes.

Complementary Theories Across Levels of Explanation

Whereas ultimate explanations focus on the underlying function of traits, proximate explanations focus more on how traits operate (e.g., Mayr, 1961). For a complete account of any phenomena, both perspectives should be considered. In this regard, findings from the interest indicator model are consistent with more proximally oriented models, including the view that humor serves a social probing function (e.g., Emerson, 1969; Goffman, 1967; Kane, Suls, & Tedeschi, 1977). Although people are interested in knowing the intentions, values, and reactions of potentially important others, etiquette may prevent one from directly asking (Kane et al., 1977). In such cases, a humorous remark can be made to indirectly reveal information about one's own attitudes. If the audience responds with laughter, that would indicate agreement. If not, then disagreement is indicated and the humorist can avoid accountability by taking refuge in the nonseriousness of humor (Goffman, 1967; Kane et al., 1977; McGhee, 1979). For instance, an observational study at a bar found that men often made humorous sexual remarks toward women. Women who laughed in response appeared sexually interested, whereas women who ignored the remarks did not appear interested (Walle, 1976). These results were interpreted from a social probing perspective, whereby humor is used to safely communicate inquiries that would be potentially offensive to the target if brought up directly.

Whereas social probing focuses on individuals safely exploring specific taboo topics by suggesting them in a humorous way, the model we have presented contends that humor functions more broadly to initiate social relationships regardless of whether a relationship is

suggested in the humor. Indeed, we found that humor may communicate attraction and romantic interest toward a potential mate even when attraction, sex, or romance is not suggested in the humor. More broadly, our model posits that humor may function as a way for individuals to indicate interest toward potential as well as existing relationships in a variety of social domains, including not only courtship, but also relationship maintenance, family relations, friendships, status hierarchies, and self-protection.

Although we have focused on humor's role in indicating and confirming relationship interest, use of humor may also affect the quality of relationships. For instance, Campbell, Martin, and Ward (2008) recently recorded couples having live conversations and found associations between the use of affiliative humor and relationship satisfaction and the use of aggressive humor and relationship dissatisfaction. Such results are consistent with the possibility that humor is used to form and regulate relationships (e.g., Shiota, Campos, Keltner, & Hertenstein, 2004).

Implications and Future Directions

We constructed our experiments around two modern-day dating venues and featured filmed, two-way conversation and audio recordings. Although these methods offered a high level of experimental control and some realism, a logical next step would be to study actual live conversations. Furthermore, investigations should expand to other domains, including parenting, friendship, status, and self-protection. Applying diverse methods in different social domains would allow a more thorough test of the interest indicator model.

Considering humor in terms of its use in initiating relationships raises various implications and empirical questions for studying humor across situations. For instance, if an underlying function of humor exchange is to allow individuals to communicate interest in potential or existing relationships, then people may have less motivation to exchange humor if explicit information is provided about the nature of the relationship. Thus, exchanging humor with an opposite-sex individual who is known to be partnered, for example, should be less rewarding than with a potential mate who is known to be single. Likewise, a person who states up front that he or she is interested may induce less humor initiation from potential mates than someone who is more ambiguous about his or her interest.

More generally, if humor is used in initiating, escalating, and maintaining relationships, we would hypothesize that the amount of humor exchanged between people should vary with how negotiable relationships are. Such a distinction might be found in societies with

high social mobility and relatively transient relationships versus societies with low social mobility and more permanent relationships. For instance, we would predict there to be less humor exchanged between potential partners and between spouses in cultures wherein marriages are arranged and divorce is less of an option. Similarly, in some cultures (e.g., Asian), the norm is for parents to invest in their children well into adult age, and children tend to comply with their parents with regard to important matters such as career, mate choice, and finances. With less need to negotiate this arrangement, there should also be less humor exchange between parents and children. Such phenomena may also be consistent with a fitness indicator model in that in such social arrangements, there may also be less need for individuals to competitively display fitness. Given the dearth of cross-situational data, it may be informative for future research to examine the use of humor from an interest indication perspective—as well as a fitness indicator view—across situations and cultures.

Another issue to consider is what exactly makes a verbal utterance humorous. The fitness indicator model would suggest that creativity or wit is especially appealing. Other evolutionary theories have suggested that people laugh to express appreciation of fitness-enhancing information (Weisfeld, 1993). Cognitive theories have proposed that an unexpected resolution of incongruence is amusing (Suls, 1983). Our view on what is funny shares common elements with each of these perspectives but considers a broader range of potentially humorous stimuli. Specifically, we propose that if there is sufficient relationship between individuals, then any unexpected utterance—including a bodily noise—can be implicitly interpreted as an indication of interest, perceived as humorous, and responded to with laughter to signal reciprocal interest. However, if there is not enough relationship interest, then even the cleverest witticisms that resolve incongruencies in the most unexpected ways may fall flat. Future research should more closely compare what is funny across perspectives.

Conclusion

Considering that it is hard to imagine forming and maintaining meaningful relationships with mates, friends, allies, family members, and other associates without the use of humor, it is somewhat shocking that “humor” does not even appear in social psychology textbooks (e.g., Martin, 2007). Indeed, the interest indicator model—and the supporting research presented here—suggests that humor can function as a key diagnostic tool for both facilitating and maintaining social relationships. Understanding how the nature of relationships may underlie humorous exchange may shed

some light on multiple interesting phenomena, including why describing a previously humorous incident often fails to reproduce the heartfelt laughter that was shared firsthand between individuals. Consistent with the interest indicator model of humor, “you had to be there” may be a suggestion to a secondhand audience that they lack the perspective needed to understand the exact relationship between the firsthand individuals.

NOTE

1. Because mating duration is an important contextual variable in mating research, we included relationship type (long term, short term) as a between-subjects variable. However, relationship type was not significant as a main effect or in any interactions, so we collapsed the data across this variable.

REFERENCES

- Alexander, R. D. (1986). Ostracism and indirect reciprocity: The reproductive significance of humor. *Ethology and Sociobiology*, 7, 253-270.
- Andersson, M. (1994). *Sexual selection*. Princeton, NJ: Princeton University Press.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Bressler, E. R., & Balshine, S. (2006). The influence of humor on desirability. *Evolution & Human Behavior*, 27, 29-39.
- Bressler, E. R., Martin, R., & Balshine, S. (2006). Production and appreciation of humor as sexually selected traits. *Evolution & Human Behavior*, 27, 121-130.
- Buss, D. M. (1988). The evolution of human intrasexual competition: Tactics of mate attraction. *Journal of Personality and Social Psychology*, 54, 616-628.
- Buss, D. M., & Schmitt, D. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, 100, 204-232.
- Campbell, L., Martin, R. A., & Ward, J. A. (2008). An observational study of humor use during a conflict discussion. *Personal Relationships*, 15, 41-55.
- Caron, J. E. (2002). From ethology to aesthetics: Evolution as a theoretical paradigm for research on laughter, humor, and other comic phenomena. *Humor: International Journal of Humor Research*, 15, 245-281.
- Darwin, C. (1871). *The descent of man and selection in relation to sex*. London: Murray.
- Emerson, J. (1969). Negotiating the serious import of humor. *Sociometry*, 32, 169-181.
- Feingold, A. (1992). Gender differences in mate selection preferences: A test of the parental investment model. *Psychological Bulletin*, 112, 125-139.
- Feist, G. J. (2001). Natural and sexual selection in the evolution of creativity. *Bulletin of Psychology and the Arts*, 2, 11-16.
- Fletcher, G. J. O., Tither, J. M., O'Loughlin, C., Friesen, M., & Overall, N. (2004). Warm and homely or cold and beautiful? Sex differences in trading off traits in mate selection. *Personality and Social Psychology Bulletin*, 30, 659-672.
- Goffman, E. (1967). *Interactional ritual: Essays on face-to-face behavior*. New York: Doubleday Anchor Books.
- Goodall, J. (1968). The behavior of free-living chimpanzees in the Gombe Stream Reserve. *Animal Behavior Monographs*, 1, 165-311.
- Griskevicius, V., Cialdini, R. B., & Kenrick, D. T. (2006). Peacocks, Picasso, and parental investment: The effects of romantic motives on creativity. *Journal of Personality and Social Psychology*, 91, 52-66.
- Griskevicius, V., Tybur, J. M., Gangestad, S. W., Perea, E. F., Shapiro, J. R., & Kenrick, D. T. (in press). Aggress to impress: Hostility as an evolved context-dependent strategy. *Journal of Personality and Social Psychology*.
- Griskevicius, V., Tybur, J. M., Sundie, J. M., Cialdini, R. B., Miller, G. F., & Kenrick, D. T. (2007). Blatant benevolence and conspicuous consumption: When romantic motives elicit strategic costly signals. *Journal of Personality and Social Psychology*, 93, 85-102.
- Harris, C. R. (1999). The mystery of ticklish laughter. *American Scientist*, 87, 344-351.
- Haselton, M., & Miller, G. F. (2006). Women's fertility across the cycle increases the short-term attractiveness of creative intelligence. *Human Nature*, 17, 50-73.
- Hewitt, L. E. (1958). Student perceptions of traits desired in themselves as dating and marriage partners. *Marriage and Family Living*, 20, 344-349.
- Hooper, P., & Miller, G. F. (2008). Mutual mate choice can drive ornament evolution even under perfect monogamy. *Adaptive Behavior*, 16, 53-70.
- Kane, T. R., Suls, J., & Tedeschi, J. T. (1977). Humour as a tool of social interaction. In A. J. Chapman & H. C. Foot (Eds.), *It's a funny thing, humour* (pp. 13-16). Elmsford, NY: Pergamon.
- Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. W. (2002). The necessities and luxuries of mate preferences: Testing the trade-offs. *Journal of Personality and Social Psychology*, 82, 947-955.
- Li, N. P., & Kenrick, D. T. (1999, December). *Making me laugh or laughing with me: Sense of humor and sexual selection*. Paper presented at Arizona State Social Psychology Research Institute, Tempe, AZ.
- Louis, R., & Copeland, D. (1998). *How to succeed with women*. Upper Saddle River, NJ: Prentice Hall.
- Loyau, A., Saint Jalme, M., Cagniant, C., & Sorci, G. (2005). Multiple sexual advertisements honestly reflect health status in peacocks (*Pavo cristatus*). *Behavioral Ecology and Sociobiology*, 58, 552-557.
- Lundy, D. E., Tan, J., & Cunningham, M. R. (1998). Heterosexual romantic preferences: The importance of humor and physical attractiveness for different types of relationships. *Personal Relationships*, 5, 311-325.
- Martin, R. A. (2007). *The psychology of humor: An integrative approach*. Burlington, MA: Elsevier.
- Mayr, E. (1961). Cause and effect in biology. *Science*, 131, 1501-1506.
- McGhee, P. E. (1979). *Humor: Its origin and development*. New York: Freeman.
- Miller, G. F. (1998). How mate choice shaped human nature: A review of sexual selection and human evolution. In C. Crawford & D. Krebs (Eds.), *Handbook of evolutionary psychology: Ideas, issues, and applications* (pp. 87-130). Mahwah, NJ: Lawrence Erlbaum.
- Miller, G. F. (2000a). *The mating mind: How sexual choice shaped the evolution of human nature*. New York: Doubleday.
- Miller, G. F. (2000b). Mental traits as fitness indicators: Expanding evolutionary psychology's adaptationism. In D. LeCroy & P. Moller (Eds.), *Evolutionary perspectives on human reproductive behavior* (pp. 62-74). New York: New York Academy of Sciences.
- Miller, G. F. (2001). Aesthetic fitness: How sexual selection shaped artistic virtuosity as a fitness indicator and aesthetic preferences as mate choice criteria. *Bulletin of Psychology and the Arts*, 2, 20-25.
- Miller, G. F. (2007). Sexual selection for moral virtues. *Quarterly Review of Biology*, 82, 97-125.
- Møller, A. P., & Petrie, M. (2002). Condition dependence, multiple sexual signals, and immunocompetence in peacocks. *Behavioral Ecology*, 13, 248-253.
- Panksepp, J., & Burgdorf, J. (2003). “Laughing” rats and the evolutionary antecedents of human joy? *Physiology & Behavior*, 79, 533-547.

- Porteous, J. (1988). Humor as a process of defense: The evolution of laughing. *Humor, 1*, 63-80.
- Provine, R. R. (2000). *Laughter: A scientific investigation*. New York: Viking.
- Shiota, M. N., Campos, B., Keltner, D., & Hertenstein, M. J. (2004). Positive emotion and the regulation of interpersonal relationships. In P. Philippot & R. S. Feldman (Eds.), *The regulation of emotion* (pp. 127-155). Mahwah, NJ: Lawrence Erlbaum.
- Sprecher, S., & Regan, P. C. (2002). Liking some things (in some people) more than others: Partner preferences in romantic relationships and friendships. *Journal of Social and Personal Relationships, 19*, 463-481.
- Suls, J. (1983). Cognitive processes in humor appreciation. In J. Goldstein (Ed.), *Handbook of humor research* (pp. 39-57). New York: Springer.
- Van Hooff, J. A. (1976). The comparison of facial expressions in man and higher primates. In M. von Cranach (Ed.), *Methods of inference from animal to human behaviour* (pp. 165-196). Chicago: Aldine.
- Walle, A. (1976). Getting picked up without being put down: Jokes and the bar rush. *Journal of the Folklore Institute, 13*, 201-217.
- Weisfeld, G. E. (1993). The adaptive value of humor and laughter. *Ethology and Sociobiology, 14*, 141-169.
- Zahavi, A., & Zahavi, A. (1997). *The handicap principle: A missing piece of Darwin's puzzle*. New York: Oxford University Press.