Original Article

Evolutionary Psychology
2015: 1–13

DOI: 10.1177/1474704915608744
evp.sagepub.com
SAGE

Effects of Humor Production, Humor Receptivity, and Physical Attractiveness on Partner Desirability

Michelle Tornquist[1] and Dan Chiappe[1]

Abstract

This study examined women's and men's preferences for humor production and humor receptivity in long-term and short-term relationships, and how these factors interact with physical attractiveness to influence desirability. Undergraduates viewed photographs of the opposite sex individuals who were high or low in physical attractiveness, along with vignettes varying in humor production and receptivity. Participants rated physical attractiveness and desirability for long-term and short-term relationships. The main findings were that individuals desired partners who were high in humor production and receptivity, though the effects were particularly pronounced for women judging long-term relationships. Moreover, humor production was more important than receptivity for women's ratings of male desirability. Notably, we also found that ratings of physical attractiveness were influenced by the humor conditions. These results are discussed in terms of the fitness indicator, interest indicator, and encryption hypotheses of the evolutionary functions of humor.

Keywords

humor production, humor receptivity, physical attractiveness, mating preferences, sexual selection

Date received: June 06, 2015; Accepted: September 02, 2015

Introduction

Much research in evolutionary psychology has examined the role humor plays in mate selection (e.g., Kuhle, 2012; Lundy, Tan, & Cunningham, 1998; McGee & Shevlin, 2009; Wilbur & Campbell, 2011). The evolutionary function of humor in mating, however, remains unresolved and several hypotheses have been offered (Kuhle, 2012). One hypothesis maintains that humor functions primarily as an indicator of fitness because it relies on mechanisms underlying human intellectual and creative ability (Bressler, Martin, & Balshine, 2006; Hone, Hurwitz, & Lieberman, 2015; Miller, 2000). Another holds that humor is used to communicate that a person is interested in initiating or maintaining a romantic relationship, and it is used when a person is attracted to an individual and is not a cause of the attraction (Cowan & Little, 2013; Li et al., 2009). A third view claims that because humor encrypts a lot of background information, it can be used to assess the compatibility of individuals (e.g., sharing values and cultural knowledge), a factor relevant not just in romantic relationships but in all types of social bonding and collaboration (Curry & Dunbar, 2013; Flamson & Barrett, 2008). The present study tests these views by examining male and female preferences for humor production and receptivity in short-term and long-term partners, and how these factors interact with physical attractiveness to determine desirability.

Humor as an Indicator of Genetic Quality

Miller (2000; Miller & Todd, 1998) proposed that humor is used as a way of identifying mates with high-quality heritable psychological traits. This is because in this view, humor requires intelligence, verbal skills, and the ability to creatively combine linguistic symbols (Miller & Todd, 1998). Because approximately one third of human genes are expressed in the brain, displays of humor offer a reliable indication of the

[1] Department of Psychology, California State University Long Beach, Long Beach, CA, USA

Corresponding Author:
Michelle Tornquist, Department of Psychology, California State University Long Beach, Long Beach, CA 90840, USA.
Email: tornquist.michelle@gmail.com

quality of those genes (Miller, 2000). Humor can therefore be used in courtship as a hard-to-fake signal of heritable psychological fitness. In support of this claim, Howrigan and MacDonald (2008) found that general intelligence predicted ratings of humor and did so independently of personality characteristics. It is important to keep in mind, however, that the relationship between humor and intelligence is likely to depend on how these concepts are defined, including the types of humor, as Galloway's (1994) review examining the connection between these variables uncovered conflicting results.

The fitness indicator hypothesis also holds that humor production may be more important for female mating decisions (Bressler et al., 2006; Kuhle, 2012). This is because women are generally choosier due to the greater minimal investment they make in reproduction compared to men (Trivers, 1972). Men need to advertise their physical and psychological traits to prove their worth to women, and women need to be capable of identifying high-quality men. In this view, then, men should be the predominant displayers of humor and women should be the predominant appreciators of humor.

Consistent with the fitness indicator theory, studies carried out over the last decade have found that although both men and women value a sense of humor in a romantic partner, they mean very different things (e.g., Bressler et al., 2006; Hone et al., 2015; Wilbur & Campbell, 2011). Women primarily refer to men's abilities to produce jokes that make them laugh (i.e., humor producers), while men refer to women's tendencies to appreciate and laugh at the humor they produce (i.e., humor receptivity). For example, Bressler, Martin, and Balshine (2006) showed that although humor receptivity was rated as desirable by both genders, the ability to produce humor by a partner was rated more desirable by women than men. Moreover, when the task required them to choose between a partner that was high in humor production and low in humor receptivity or low in humor production and high in humor receptivity, women tended to choose the former and men the latter. These gender differences were particularly evident in the context of dating and long-term relationships but not one-night stands or short-term relationships. Hone, Hurwitz, and Lieberman (2015) replicated these findings, and using a trait purchasing task also showed that for women humor production is a necessity, while humor receptivity is a luxury. For men, the opposite is the case.

Wilbur and Campbell (2011) also tested the fitness indicator hypothesis by asking college students about what humor strategy they would be more likely to use when getting to know a romantic partner. They found that men reported they would use humor production, whereas women were more likely to report that they would use humor evaluation strategies. In another study examining an online dating site, they found that men were more likely to offer humor, while women were more likely to make humor production requests. Moreover, women's ratings of romantic interest were positively correlated with their humor production ratings of the men, but men's ratings were unrelated to women's humor production. For women, ratings of humor were also positively correlated with their ratings of men's intelligence and warmth.

Humor as Relationship Interest Indicator

Another account of the evolutionary function of humor in mating holds that it serves as a signal of relationship interest (Cowan & Little, 2013; Li et al., 2009). Humor is produced when a person (male or female) wants to initiate a romantic relationship or is seeking to maintain an existing one. Depending on how the recipient of humor responds, the producer can determine whether the interest is reciprocal. If the recipient responds with genuine laughter, for example, the producer will likely infer desire in a relationship. On the other hand, if the recipient does not laugh, the producer will likely infer that the person is not interested in initiating a romantic relationship, or does not feel the same way about an existing relationship. By conveying this information implicitly, it allows individuals to save face, as the costs of rejection are likely to be lower than if an explicit statement of interest is made. A key implication of this view is that attraction precedes humor and is not the cause of it. Humor is produced when an individual is attracted to another person, and if the recipient is attracted to the producer, they respond positively.

A set of experiments by Li et al. (2009) provided support for this hypothesis. In one study, participants imagined interacting with someone they were either attracted to or not attracted to. They were asked to indicate how likely they would be to initiate a general conversation and how likely they would be to initiate humor. They found that men and women would be much more likely to initiate a conversation and to initiate humor if they were attracted to the individual than if they were not attracted. Moreover, if attracted, they reported being more likely to initiate humor than a general conversation. Participants also reported being much more likely to respond positively with laughter to the other person's humor if they were attracted to them. A second study also found that humorous statements were rated as being funnier by men and women if the participants believed that they came from a person that they were attracted to and wanted a relationship with, a pattern that held for both men and women. In a third study, Li et al. (2009) found that third-party observers watching a mock "speed dating" session rated males using humor as being more interested in the female recipient than if they simply offered a general conversation. Moreover, females that responded positively to the humor were much more likely to be rated as interested in the male when he produced humor than females that responded negatively to the humor.

Cowan and Little (2013) also found that physical attractiveness can increase the ratings of how funny a person is. In their study, participants were presented with audio clips on their own and as part of a video showing a person's face. The audio clips were responses of the person in the video to a question asking the person which two of three objects they would bring to a desert island, and how they would use it. Participants had to rate how humorous the responses were. They found that for both men and women, humor ratings for the attractive faces increased relative to the audio-only condition, while for the less attractive faces, humor ratings decreased relative to the

audio-only condition. In a follow-up study, they found that humor used to answer the questions in males and females was positively correlated with perceived flirtatiousness, a finding consistent with the interest indicator hypothesis.

Humor as an Encryption of Compatibility

According to the encryption hypothesis, humor functions as a reliable signal of shared common knowledge, values, preferences, and goals (Curry & Dunbar, 2013; Flamson & Barrett, 2008). Identifying individuals similar in these respects is important because when people choose partners for cooperative ventures, they have to choose those with whom they are compatible. Humor can serve this purpose because although jokes are explicit statements, understanding and appreciating them often require possessing implicit knowledge, values, and attitudes. After all, not everyone understands the same jokes, and even if they do understand them, they may not find them funny. In this view, then, people produce humor as a way of broadcasting information about themselves, and monitoring the reactions of others indicates whether they share the background culture needed to appreciate that humor. In the context of mating, two individuals laughing at the same things can serve to indicate that they are culturally compatible and likely to be successful in the joint venture of raising children and building a life together. Consistent with this claim, Murstein and Brust (1985) found that couples with a similar sense of humor are likelier to stay together. An important virtue of this hypothesis, however, is that it readily explains the role of humor in various contexts outside of mating, including friendships and other long-term partnerships where a shared vision is crucial.

Flamson and Barrett (2008) provided evidence supporting the encryption hypothesis. They examined whether prior familiarity with the topics of jokes affects how funny people regard them. In one experiment, they presented participants with jokes that were either ''low encryption'' or ''high encryption'' by manipulating whether or not information relevant to understanding the jokes was made explicit in the jokes themselves. They also assessed whether or not participants had prior familiarity with the topics. Their results were that participants found jokes to be funnier when they had prior knowledge of the topics, and those with prior knowledge preferred the highly encrypted, less explicit, versions of the jokes. In contrast, those with less familiarity preferred the less encrypted versions. In a second experiment, the jokes were the same across conditions and what was manipulated was whether or not a preceding paragraph contained information that decrypted the joke by providing relevant information. They found that those with greater prior knowledge appreciated the jokes more than those with less prior knowledge, and decrypting information increased the appreciation of the jokes of those who were less familiar with the topics.

More recently, Curry and Dunbar (2013) have examined whether similarity in appreciation of humor affects people's perceptions of whether they are likely to get along with others and whether humor is more effective in this regard than other indications of shared culture. Participants were presented with either a set of jokes or a set of first lines of novels. Those receiving jokes had to indicate whether or not they thought they were funny, and those receiving opening lines were asked to rate whether or not they liked them. Later on they were presented with the profile of another (fictional) individual who varied in terms of how similar their judgments of the jokes were to those of the participants, or how similar their judgments of the opening lines were. Participants were asked several questions to measure the degree of affiliation they perceive with those individuals, including how well they would get along with them, if they would like them, whether they would enjoy working with them, and whether they believe they have a lot in common. In addition to measures of affiliation, they were asked to rate the other person's intelligence, trustworthiness, popularity, and attractiveness.

Curry and Dunbar (2013) found that as similarity increased, so too did the affiliation scores. The type of stimulus did not seem to matter, as the same effects were produced by jokes and preferences for first lines of novels. They did find, however, that similarity of humor predicted altruistic responses. At the end of the study, participants were given the option of sharing a portion of their compensation with the other individual, and they found that shared appreciation of humor predicted degree of altruism, while shared appreciation of first lines did not. Also noteworthy was their finding that although similarity in humor and first-line preferences predicted affiliation, it did not influence ratings of the person's other characteristics, including their attractiveness. The effects on affiliation were thus unique to cooperation and did not influence overall the evaluations of others.

Current Study

The current study presented undergraduate students with photographs of opposite sex individuals that were either higher or lower in attractiveness, along with vignettes that described their humor production and receptivity as either high or low. For each, they rated their desirability for short-term and long-term relationships as well as rating their physical attractiveness. The design allowed us to test key predictions of the fitness indicator, interest indicator, and encryption hypotheses.

The fitness indicator hypothesis predicts that because humor is an indicator of good genes and (more proximally) of desirable psychological qualities such as intelligence and creativity, detecting the presence of humor should increase the desirability of both physically attractive and physically unattractive individuals. Moreover, the hypothesis predicts that humor is important for both long-term and short-term mating, as in both contexts, people would be attracted to qualities that can be passed onto offspring. Moreover, the hypothesis predicts that humor production should be more important to females than males as well as being more important to women than humor receptivity. Finally, it predicts that humor receptivity should be more important to men than humor production and more important to men than to women.

The interest indicator hypothesis predicts that humor, especially humor production, should boost the desirability of individuals more if they are higher in attractiveness than if they are lower in attractiveness. This is because the perception of humor depends on whether an individual is already attracted to the person. People should thus welcome humor more in the physically attractive than in the less attractive. Moreover, the interest indicator hypothesis predicts that the effects of humor on desirability should be equally robust in short-term and long-term mating contexts. This is because it holds that humor serves to indicate interest in both types of relationships, either to initiate a relationship or to indicate interest in maintaining it. Finally, the theory does not predict any sexually dimorphic patterns in terms of the effects of humor production or humor receptivity. In this view, men and women use both humor production and humor receptivity to indicate interest in a relationship.

The encryption hypothesis predicts that humor production and receptivity should both boost the desirability ratings of men and women, as both offer a means of assessing the compatibility of potential mates. In addition, the hypothesis predicts that the effects of humor should be particularly pronounced in long-term mating. In the case of short-term mating, assessments of compatibility are not likely to be relevant, because the individuals do not foresee engaging in activities where a great deal of cooperation and coordination are required. Finally, the encryption hypothesis predicts that the desirability of opposite sex individuals should be boosted by humor production and receptivity, regardless of the level of physical attractiveness. Discovering that someone makes you laugh and laughs at your offers of humor should increase feelings of affiliation toward that person and does not depend on any preexisting attraction to the individual based on surface characteristics.

The present study also had participants rate the *physical* attractiveness of individuals in the photographs, in addition to short-term and long-term mating desirability. This was done to determine whether nonphysical characteristics such as humor can influence judgments of physical attractiveness. Although many studies have shown that physical beauty influences perceptions of psychological and social traits (e.g., Dion, Berscheid, & Walster, 1972), little research has examined whether characteristics such as personality, humor, or intelligence can influence how physically attractive someone is judged to be (Swami, 2012). Because personality and other psychological characteristics influence the fitness value of a person just as their physical traits do, it is possible that judgments of beauty integrate both physical and nonphysical dimensions.

In one of the few studies examining the issue, Kniffin and Wilson (2004) had participants rate the physical attractiveness of people in their yearbook, along with how familiar they were with them, how likeable they were, and how much they respected them. They also had strangers rate the photos for physical attractiveness. As they were unfamiliar with the people in the yearbook, the strangers made their judgments based solely on physical characteristics. Using a stepwise regression procedure, Kniffin and Wilson (2004) found that nonphysical factors including liking and respecting explained variance in ratings of physical attractiveness beyond what could be explained by the strangers' ratings of physical attractiveness. Moreover, women's ratings of physical attractiveness were more strongly influenced by nonphysical factors than were men's ratings. For the latter, a greater proportion of the variance in physical attractiveness ratings was explained by the ratings of the strangers. This is consistent with previous findings that men tend to emphasize women's ability to make a physical investment in reproduction, while women emphasize a man's ability to provide resources for the raising of offspring (Feingold, 1990; Smith, Waldorf, & Trembath, 1990).

Based on these considerations, the fitness indicator hypothesis predicts that participants' ratings of physical attractiveness will be influenced by information regarding humor, with those portrayed as having a better sense of humor also being rated more physically attractive. Moreover, it predicts that women's ratings of male physical attractiveness should be more strongly influenced by the humor information than men's ratings, as women tend to weigh more heavily nonphysical characteristics in mate selection, especially during the nonovulatory phase of their cycle (Gangestad, Garver-Apgar, Simpson, & Cousins, 2007). In contrast, the interest indicator hypothesis does not predict that physical attractiveness should be influenced by information regarding sense of humor. In this view, humor is not the cause of attraction. Instead, humor is produced when attraction is already present. The encryption hypothesis also does not predict that information regarding humor will affect judgments of physical attractiveness. The reason for this is that as Curry and Dunbar (2013) state, the effect of humor is "specific to cooperation, and not the result of a more positive general evaluation of the 'other' person" (p. 129). They failed to find evidence, for example, that similarity of humor predicted evaluations of attractiveness of the other individual.

Material and Method

Participants

One-hundred and thirteen undergraduate students (54 women and 59 men) from California State University, Long Beach participated. They were recruited from the Introductory Psychology subject pool and received course credit. A requirement for inclusion was that students had to identify with a heterosexual orientation. Mean age was 18.7 years (range 17–24 years). Their self-reported ethnicity was 25% White, 33% Hispanic Latino, 30% Asian, 4% Black African American, 4% Native Hawaiian Pacific Islander, and 6% other. Two women and two men were dropped for failing to complete all parts of the experiment. The study was approved by California State University, Long Beach's Institutional Review Board.

Material

Humor-style vignettes. To examine men's and women's humor preferences, we developed 24 vignettes (6 for each humor

condition, 2 adapted from Bressler et al., 2006). Each one, presented on a computer screen, described a unique scenario in which the participant was approached by a stranger of the opposite sex who initiated a friendly conversation with the participant. They described the strangers as varying in humor production and receptivity. In particular, they were described as being high in humor production and low in humor receptivity (HP/LR), high in humor production and high in humor receptivity (HP/HR), low in humor production and high in humor receptivity (LP/HR), or low in humor production and low in humor receptivity (LP/LR). Sample vignettes are shown in Appendix A.

Facial stimuli. Participants were shown 24 facial photographs of the opposite sex (11 cm wide × 12 cm long), one photograph for each vignette. Photographs were of individuals who varied in age, from approximately 20 to 30 years, as well as ethnic background. All photographs were of a person looking directly into the camera with a neutral expression and against a white background. A total of 24 female and 24 male faces were selected based on their attractiveness. To obtain this set, 40 male and 40 female photographs were prerated for physical attractiveness using an 8-point Likert-type scale (1 = *very unattractive*, 8 = *very attractive*). Preratings were done by 23 individuals who did not take part in the main study (10 men and 13 women). Each person rated opposite-sex photographs. From the 80 photographs, 12 women rated higher in attractiveness ($M = 5.78$, $SD = 1.05$) and 12 men rated higher in attractiveness ($M = 5.69$, $SD = 0.68$) were selected, all receiving a mean rating of 5 or higher. In addition, 12 women rated lower in attractiveness ($M = 2.08$, $SD = 0.90$) and 12 men rated lower in attractiveness ($M = 1.58$, $SD = 0.53$) were selected, all receiving mean ratings of less than 4. The ratings of the higher attractiveness female photos did not differ significantly from those of the higher attractiveness males, $t(21) = 0.24$, $p = .81$. The ratings of the lower attractiveness females also did not differ from those of the lower attractiveness males, $t(21) = 1.67$, $p = .11$. For females, however, the ratings of the more attractive group were higher than for the less attractive group, $t(9) = 9.66$, $p < .001$. Likewise, the ratings of the more attractive males were higher than those of the less attractive males, $t(12) = 24.97$, $p < .001$.

Each photo appeared in each of the four humor conditions, so that faces were not confounded with humor type. The photographs were retrieved from The Center for Vital Longevity Face Database (Minear & Park, 2004), from The Beautycheck Website (Gruendl, n.d.), and by asking people from outside the university to take their photograph to use in a research study.

Desirability ratings. Participants rated each photographed individual presented alongside a vignette for his or her desirability along different dimensions, on a 7-point Likert-type scale (1 = *very undesirable*, 7 = *very desirable*). In particular, they had to rate "how desirable is this person as a short-term partner?" and "how desirable is this person as a long-term partner?" Short-term and long-term relationships were defined to ensure the same understanding of these terms among the participants (short term: one-night stand, occasional dating; long term: boyfriend or girlfriend, living together, marriage). In addition, participants had to rate "how physically attractive is this individual?" on a 7-point Likert-type scale (1 = *very unattractive*, 7 = *very attractive*).

Procedure

After reading and signing the consent form, participants completed a demographic survey that had them state their gender, ethnicity, and age. Once completed, they were instructed that they would have to view a number of photographs paired with a vignette (i.e., profiles) describing a hypothetical interaction between the participant and the individual in the photograph. In line with the study conducted by Didonato, Bedminister, and Machel (2013), participants were told that during the experiment they should imagine themselves as a single person who is willing to meet people and who is available for dating. They were also told that the potential partner in the vignettes should be regarded as available and interested in the participant. This is because prior studies have shown that participants' relationship status (Lydon, Meana, Sepinwall, Richards, & Mayman, 1999) and the relationship status of potential partners (Koranyi, Gast, & Rothermund, 2013) may influence participants' judgements of partner desirability. The participants were also instructed to listen carefully while the experimenter read them the vignettes, which would also be shown on the computer screen.

For each pair of photographs and vignettes, participants rated each individual for his or her desirability as a short-term partner, long-term partner, and physical attractiveness, in that order. Each of the 24 trials consisted of a sequence of four computer screens. On the first, participants saw the photograph on the left-hand side, with the vignette on the right. After the experimenters read the vignettes, participants could take their time to review them before pressing the space bar to see the remaining screens. On the second, participants saw the photograph along with the question asking them to rate desirability as a short-term partner. The 7-point rating scale appeared below the question. The third and fourth screens were the same except that they asked participants to rate the desirability as a long-term partner and physical attractiveness, respectively. Participants entered their ratings using the numbers on the keyboard. They advanced to the next screen automatically once they entered a number.

All participants were exposed to six profiles in each of the four humor conditions (HP/LR, LP/HR, HP/HR, and LP/LR). Half of the profiles in each humor condition had photographs of higher attractiveness individuals and half had photographs of lower attractiveness individuals. Items were presented in a random order for each participant. The experiment took up to 1 hr to complete. Demographics, vignettes, photographs, and questions were presented to participants on a stationary computer via E-Prime 2.0 software (Psychology Software Tools, Pittsburgh, PA, USA).

Results

In what follows, we examine the effects of humor production, humor receptivity, and physical attractiveness of photographs on participants' ratings of partner desirability using a series of $2 \times 2 \times 2 \times 2$ mixed factors analyses of variance (ANOVAs). In these analyses, gender (male/female) is between subjects factor and humor receptivity (high/low), humor production (high/low) and physical attractiveness (higher/lower) are the repeated measures factors. Separate ANOVAs were carried out on the ratings of long-term partner desirability, short-term partner desirability, and physical attractiveness. All results are summarized in Appendix B.

Long-Term Partner Desirability

The analysis revealed a significant main effect of gender on desirability as a long-term partner, $F(1, 112) = 5.02$, $p = .03$, $\eta_p^2 = .04$, with men giving higher long-term desirability ratings than women. There was also a significant main effect of humor production, $F(1, 112) = 53.89$, $p < .001$, $\eta_p^2 = .33$, with high producers rated as more desirable than low producers. The effect of humor receptivity was also significant, $F(1, 112) = 54.03$, $p < .001$, $\eta_p^2 = .33$, with highly receptive individuals receiving higher desirability ratings than individuals low in humor receptivity. Results also revealed a marginally significant interaction between production and gender, $F(1, 112) = 3.38$, $p = .068$, $\eta_p^2 = .03$. For women, there was a significant effect of production, $F(1, 54) = 34.98$, $p < .001$, $\eta_p^2 = .39$, as there was for men, $F(1, 58) = 18.51$, $p < .001$, $\eta_p^2 = .24$; however, the effect was stronger for women. Results also showed a significant interaction between humor receptivity and gender, $F(1, 112) = 5.13$, $p = .03$, $\eta_p^2 = .04$. Simple effects tests revealed that for women, there was a significant effect of receptivity, $F(1, 54) = 46.30$, $p < .001$, $\eta_p^2 = .46$. There was also a significant effect of receptivity for men, $F(1, 58) = 12.71$, $p = .001$, $\eta_p^2 = .18$, although the effect was stronger for women. There was also an interaction between humor production and humor receptivity, $F(1, 112) = 14.78$, $p < .001$, $\eta_p^2 = .12$. All of these effects, however, were qualified by a significant interaction between gender, humor production, and humor receptivity, $F(1, 112) = 13.53$, $p < .001$, $\eta_p^2 = .11$.

To examine the three-way interaction, we performed separate 2 (humor production: high/low) $\times$ 2 (humor receptivity: high/low) ANOVAs for women's and men's long-term partner desirability ratings. Figure 1 illustrates these findings. For women, the results revealed a significant interaction between humor production and humor receptivity, $F(1, 54) = 20.92$, $p < .001$, $\eta_p^2 = .28$. Simple effects tests revealed that, holding level of humor production constant, women rated men who were high producers more desirable long-term partners when they were also high in humor receptivity ($M = 3.92$, $SE = 0.17$) than when they were low in humor receptivity ($M = 3.13$, $SE = 0.15$), $F(1, 54) = 51.19$, $p < .001$, $\eta_p^2 = .49$. For men low in humor production, however, receptivity had no effect on their desirability, $F(1, 54) = 2.97$, $p = .09$, $\eta_p^2 = .05$. These results

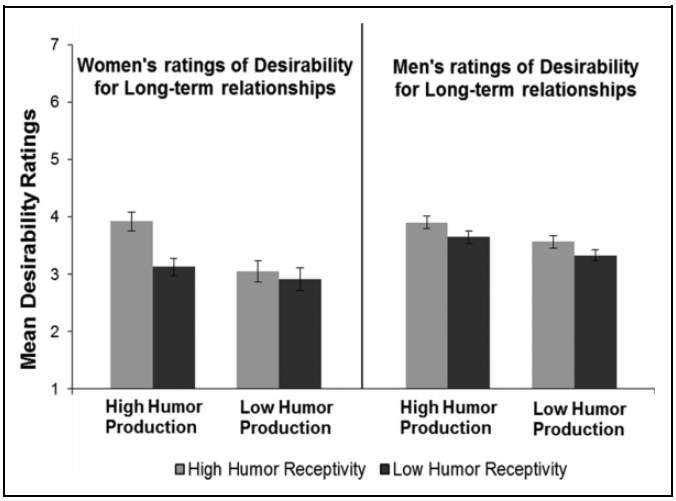

Figure 1. Women's and men's mean ratings of long-term partner desirability as a function of humor production (high and low) and humor receptivity (high and low). Each error bar represents mean $\pm$ standard error.

suggest that humor production is more important than receptivity for women, as being highly receptive to humor-only matters if a man is also a high humor producer.

In contrast, for men rating the long-term mating desirability of women, the interaction between humor production and humor receptivity was not significant, $F(1, 58) = 0.02$, $p = .89$, $\eta_p^2 = .00$. Thus, for men, humor receptivity is desirable regardless of the level of humor production.

With respect to effects of physical attractiveness of the photographs, we found that it strongly affected desirability of long-term mates, $F(1, 112) = 503.02$, $p < .001$, $\eta_p^2 = .82$. This was especially the case for males, as revealed by a significant interaction between gender and attractiveness, $F(1, 112) = 11.64$, $p = .001$, $\eta_p^2 = .09$. Simple effects tests showed that there was a significant effect of attractiveness for women's ratings of male desirability, $F(1, 54) = 224.98$, $p < .001$, $\eta_p^2 = .81$, but the effect was slightly stronger for men's ratings of female desirability, $F(1, 58) = 286.38$, $p < .001$, $\eta_p^2 = .83$. Results also showed a marginally significant interaction between physical attractiveness and humor receptivity, $F(1, 112) = 3.59$, $p = .06$, $\eta_p^2 = .03$. Simple effects analyses revealed that individuals who were higher in physical attractiveness were perceived as more desirable long-term partners when they were high in humor receptivity ($M = 4.87$, $SE = 0.11$) than when low in humor receptivity ($M = 4.44$, $SE = 0.11$), $F(1, 112) = 36.49$, $p < .001$, $\eta_p^2 = .24$. The pattern was in the same direction for individuals lower in physical attractiveness such that those high in humor receptivity ($M = 2.36$, $SE = 0.11$) were also considered more desirable than those low in humor receptivity ($M = 2.08$, $SE = 0.10$), $F(1, 112) = 25.34$, $p < .001$, $\eta_p^2 = .18$. The effect of humor receptivity, however, was stronger for the more attractive individuals, as indicated by the larger effect size. Humor receptivity therefore enhances the desirability of individuals as long-term partners, especially if they are more physically attractive.

Short-Term Partner Desirability

The analysis of short-term partner desirability ratings revealed that males gave higher ratings than females, $F(1, 112) = 10.14$, $p = .002$, $\eta_p^2 = .08$. High humor producers were also rated more desirable short-term partners than low producers, $F(1, 112) = 12.10$, $p = .001$, $\eta_p^2 = .10$, and highly receptive individuals were rated more desirable than low receptive individuals, $F(1, 112) = 15.44$, $p < .001$, $\eta_p^2 = .12$. Unlike with long-term ratings, production did not interact with gender, $F(1, 112) = 0.086$, $p = .77$, $\eta_p^2 = .001$, and receptivity did not interact with gender, $F(1, 112) = 0.003$, $p = .96$, $\eta_p^2 = .00$. We did find a significant interaction between humor production and humor receptivity, $F(1, 112) = 4.24$, $p = .04$, $\eta_p^2 = .04$. There was also a marginally significant interaction between humor production, humor receptivity, and gender, $F(1, 112) = 2.99$, $p = .09$, $\eta_p^2 = .03$.

To examine the three-way interaction, we performed separate 2 (humor production: high/low) × 2 (humor receptivity: high/low) ANOVAs for women and men. These results are presented in Figure 2. For women's ratings of men's desirability as short-term partners, there was a significant interaction between humor production and humor receptivity, $F(1, 54) = 4.82$, $p = .03$, $\eta_p^2 = .08$. Holding the level of humor production constant, women judged men who were high in production as more desirable when they were also high in humor receptivity ($M = 3.36$, $SE = 0.12$) than when they were low in receptivity ($M = 3.06$, $SE = 0.12$), $F(1, 54) = 9.16$, $p = .004$, $\eta_p^2 = .15$. When men were low in humor production there was no difference in desirability between high receptivity and low receptivity males, $F(1, 54) = 0.03$, $p = .86$, $\eta_p^2 = .001$. As with the long-term ratings, short-term results suggest that humor production is more important to women than is receptivity. For men rating women, the interaction between humor production and humor receptivity did not reach significance, $F(1, 54) = 0.10$, $p = .76$, $\eta_p^2 = .002$. Thus, for men, the effect of humor receptivity was not affected by the level of humor production.

Regarding the effects of the physical attractiveness of the photographs, we found a large effect on short-term mating desirability, $F(1, 112) = 1{,}453.09$, $p < .001$, $\eta_p^2 = .93$. There was also an interaction between gender and attractiveness, $F(1, 112) = 5.42$, $p = .022$, $\eta_p^2 = .05$. Simple effects tests showed that there was a significant effect of attractiveness for women's ratings, $F(1, 54) = 649.55$, $p < .001$, $\eta_p^2 = .92$, and a slightly stronger effect for men's ratings, $F(1, 58) = 811.95$, $p < .001$, $\eta_p^2 = .93$. There was also a significant interaction between humor receptivity and physical attractiveness, $F(1, 112) = 7.59$, $p = .007$, $\eta_p^2 = .06$. Simple effects tests revealed that individuals who were higher in physical attractiveness were rated more desirable when they were high in humor receptivity ($M = 5.02$, $SE = 0.09$) than when they were low in receptivity ($M = 4.78$, $SE = 0.09$), $F(1, 112) = 18.81$, $p < .001$, $\eta_p^2 = .14$. For individuals low in physical attractiveness, there was no difference between those high in receptivity and those low in receptivity, $F(1, 112) = 1.50$, $p = .22$. Thus, for short-term partners, being receptive to humor did not boost the desirability of partners when they were low in physical attractiveness. This contrasts with the long-term desirability ratings where there was a difference between the two levels of receptivity when attractiveness was low. No other interactions reached significance.

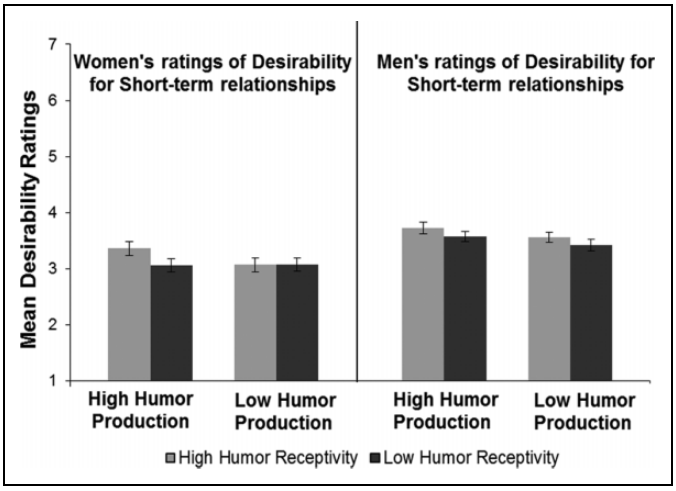

Figure 2. Women's and men's mean ratings of short-term partner desirability as a function of humor production (high and low) and humor receptivity (high and low). Each error bar represents mean ± standard error.

Ratings of Physical Attractiveness

Serving as a manipulation check, we found that photographs in the "higher attractiveness" category received higher ratings of physical attractiveness by our experimental participants than the photographs in the "lower attractiveness" category, $F(1, 112) = 482.34$, $p < .001$, $\eta_p^2 = .81$. Results also revealed that individuals who were high in humor production received higher ratings of physical attractiveness than individuals low in humor production, $F(1, 112) = 102.39$, $p < .001$, $\eta_p^2 = .48$. Individuals high in humor receptivity were also rated more physically attractive than individuals low in receptivity, $F(1, 112) = 115.61$, $p < .001$, $\eta_p^2 = .51$. These findings demonstrate that judgments of physical attractiveness can be influenced by information regarding the personality characteristics of individuals.

Results also showed that men gave higher physical attractiveness ratings than women, $F(1, 112) = 7.41$, $p = .008$, $\eta_p^2 = .06$. There was also a significant interaction between humor production and gender, $F(1, 112) = 4.98$, $p = .03$, $\eta_p^2 = .04$. Simple effects tests revealed that the effect of humor production on attractiveness was significant for men's ratings, $F(1, 58) = 30.57$, $p < .001$, $\eta_p^2 = .35$, but the effect of humor production was much stronger for women's ratings, $F(1, 54) = 78.26$, $p < .001$, $\eta_p^2 = .59$.

The interactions between humor production and humor receptivity, $F(1, 112) = 66.94$, $p < .001$, $\eta_p^2 = .37$; physical attractiveness and gender, $F(1, 112) = 11.55$, $p = .001$, $\eta_p^2 = .09$; humor production and physical attractiveness, $F(1, 112) =$

8.29, $p = .005$, $\eta_p^2 = .07$; and humor receptivity and physical attractiveness, $F(1, 112) = 53.29$. $p < .001$, $\eta_p^2 = .32$ were also significant. In addition, the interactions between gender, humor production, and humor receptivity, $F(1, 112) = 9.93$, $p = .002$, $\eta_p^2 = .08$; between humor receptivity, physical attractiveness, and gender, $F(1, 112) = 4.91$, $p = .03$, $\eta_p^2 = .04$; and between humor production, humor receptivity, and physical attractiveness, $F(1, 112) = 12.83$, $p = .001$,$\eta_p^2 = .10$ were also significant. All of these effects were qualified by a significant four-way interaction between humor production, humor receptivity, physical attractiveness, and gender, $F(1, 112) = 4.76$, $p = .03$, $\eta_p^2 = .04$. To examine the nature of the four-way interaction, we performed 2 (humor production: high/low) × 2 (humor receptivity: high/low) × 2 (physical attractiveness: higher/lower) ANOVAs for women and men separately.

Women's ratings of male physical attractiveness. The three-way interaction between humor production, humor receptivity, and physical attractiveness was significant, $F(1, 54) = 13.14$, $p = .001$, $\eta_p^2 = .20$. To examine the three-way interaction, we conducted 2 (humor production: high/low) × 2 (humor receptivity: high/low) ANOVAs for each level of physical attractiveness separately. These results are shown in Figure 3. For women's physical attractiveness ratings of the more attractive male photographs, there was a significant interaction between humor production and humor receptivity, $F(1, 54) = 46.31$, $p < .001$, $\eta_p^2 = .46$. Holding the level of humor production constant, for the high humor production condition, men high in humor receptivity ($M = 4.93$, $SE = 0.18$) were perceived as more physically attractive than men low in receptivity ($M = 3.33$, $SE = 0.15$), $F(1, 54) = 81.95$, $p < .001$, $\eta_p^2 = .60$. The one-way ANOVA for the low humor production condition did not reach significance, $F(1, 54) = 0.009$, $p = .92$, $\eta_p^2 = .00$.

For women's physical attractiveness ratings of the less attractive male photographs, the interaction between humor production and humor receptivity was also significant though the effect size was smaller than for the more attractive male photographs, $F(1, 54) = 30.44$, $p < .001$, $\eta_p^2 = .36$. Men who were high in humor production were perceived as more physically attractive when they were also high in humor receptivity ($M = 2.71$, $SE = 0.20$) than when they were low in receptivity ($M = 1.95$, $SE = 0.15$), $F(1, 54) = 30.53$, $p < .001$, $\eta_p^2 =$. 36. For men who were low in humor production, receptivity did not have an effect on perceptions of physical attractiveness, $F(1, 54) = 1.52$, $p = .22$, $\eta_p^2 =$. 03. These results parallel the findings for women when rating the desirability of long-term partners and short-term partners, with humor receptivity only boosting desirability when combined with high humor production.

Men's ratings of female physical attractiveness. Unlike women's ratings, the three-way interaction between humor production, humor receptivity, and physical attractiveness was not significant for men, $F(1, 58) = 1.28$, $p = .26$, $\eta_p^2 = .02$. Nonetheless, to examine how humor production and humor receptivity affected men's ratings of physical attractiveness, we performed

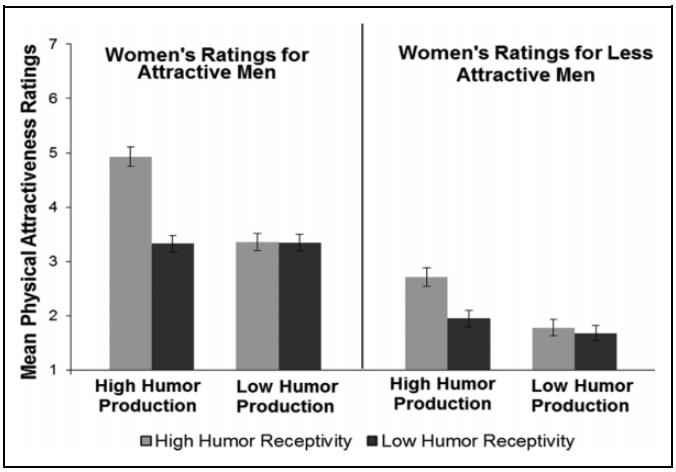

Figure 3. Women's mean ratings of physical attractiveness for attractive and less attractive men as a function of humor production (high and low) and humor receptivity (high and low). Each error bar represents mean ± standard error.

2 (humor production: high vs. low) × 2 (humor receptivity: high vs. low) ANOVAs. We did so for each physical attractiveness group separately in order to parallel our analyses of women's ratings of male attractiveness. Results of these analyses are depicted in Figure 4. For the higher attractiveness female photographs, the interaction between humor production and humor receptivity was significant, $F(1, 58) = 8.55$, $p = .005$, $\eta_p^2 = .13$. Holding humor production constant, for the high production condition, women who were high in humor receptivity ($M = 5.39$, $SE = 0.14$) were rated more physically attractive than those low in receptivity ($M = 4.14$, $SE = 0.13$), $F(1, 58) = 57.51$, $p < .001$, $\eta_p^2 = .50$. For the low humor production condition, the ANOVA revealed that women high in humor receptivity were also rated more physically attractive ($M = 4.51$, $SE = 0.13$) than those low in receptivity ($M = 3.87$, $SE = 0.14$), $F(1, 58) = 22.26$, $p < .001$, $\eta_p^2 = .28$.

For the lower attractiveness female photographs, the interaction between humor production and humor receptivity was also significant, $F(1, 58) = 9.12$, $p < .004$, $\eta_p^2 = .14$. Women who were high in humor production were perceived as more physically attractive when they were high in humor receptivity ($M = 2.51$, $SE = 0.19$) than when low in receptivity ($M = 2.06$, $SE = 0.14$), $F(1, 58) = 20.36$, $p < .001$, $\eta_p^2 = .26$. For women who were low in humor production, humor receptivity did not have an effect on men's ratings of physical attractiveness, $F(1, 58) = 0.36$, $p = .55$, $\eta_p^2 = .006$. For the attractive females, then, their physical attractiveness was enhanced when they were receptive to humor even when their humor production was low. This was not the case for the less attractive females. For them, both high production and receptivity needed to be present to boost their physical attractiveness.

Discussion

This study examined the effects of humor production and humor receptivity on the desirability of men and women who

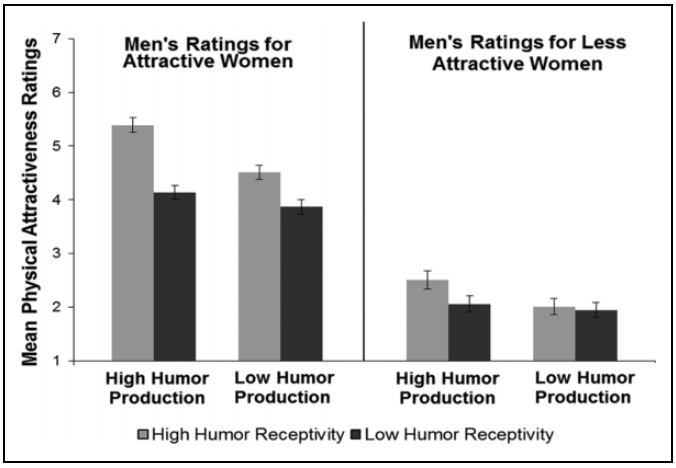

Figure 4. Men's mean ratings of physical attractiveness for attractive and less attractive women as a function of humor production (high and low) and humor receptivity (high and low). Each error bar represents mean $\pm$ standard error.

vary in physical attractiveness. The goal was to assess the evolutionary function of humor in the context of mating, focusing on whether it functions predominantly as an indicator of fitness, as an indicator of romantic interest, or as an encryption of compatibility.

With respect to the effects of humor on the desirability of long-term mates, the results revealed that both humor production and humor receptivity were desired by men and women. Consistent with the fitness indicator hypothesis, however, humor production had a stronger effect on women's ratings than it did on males. According to this view, because males make a smaller minimum investment in reproduction, they have to display their traits to prove their worth to females, the high investing sex. The production of humor serves to indicate desirable and heritable psychological characteristics including intelligence, creativity, and language ability (Miller, 2000). Also consistent with the fitness indicator view, humor production in a prospective partner was more important to women than was humor receptivity. This was evidenced by the fact that humor receptivity only had an effect on women's ratings when the men were also high producers of humor. This is similar to Hone et al.'s (2015) finding that for women, humor production is a necessity, while humor receptivity is a luxury.

Even though humor production was more important to women than receptivity to humor, we also found that receptivity had a stronger effect on women's ratings of long-term partner desirability than on men's ratings, a finding that goes against the fitness indicator hypothesis. The fact that a man's receptivity to humor is very important to women is consistent with the encryption hypothesis. After all, failure to appreciate a woman's humor may convey that the man does not share a woman's values or cultural experiences and is therefore less likely to be successful at engaging in cooperative ventures such as childrearing (Curry & Dunbar, 2013). Indeed, in conversations, laughter has been found to be an indicator of agreement and affiliation with the person talking (Vettin & Todt, 2004). There is nothing in the encryption view, however, that predicts that women should value both production and receptivity to humor more than men, as compatibility should be a concern to both. Nonetheless, this finding is consistent with previous research showing that women generally pay more attention to the internal attributes of potential mates than do men (e.g., Furnham, 2009).

In addition to the humor conditions predicting long-term ratings, we also found that physical attractiveness strongly predicted desirability. Despite the importance of physical attractiveness, we only found modest evidence supporting the interest indicator hypothesis. The hypothesis holds that how humor is perceived depends on whether there is an attraction between individuals (Li et al., 2009). People produce humor when they want to indicate they are interested in someone, and if the recipient is attracted to the person, they will respond more positively to the humor that is offered. As a result, humor should boost long-term partner desirability when physical attractiveness is high but not when it is low. The only evidence consistent with this hypothesis was a marginally significant interaction between humor receptivity and attractiveness, with receptivity boosting desirability of the physically attractive individuals more than the less attractive. We did not, however, find an interaction between humor production and physical attractiveness. Instead, humor production caused an increase in desirability of the lower and higher physically attractive individuals equally, as predicted by the fitness indicator hypothesis and the encryption hypothesis.

With respect to short-term partner ratings, we found that the effects of physical attractiveness were even stronger than they were for long-term partner ratings. This is similar to Buss and Schmitt (1993), who found that physical attractiveness was more important for short-term mating than for long-term mating. In contrast, although humor production and receptivity boosted the desirability of potential partners, the effects of the humor conditions were generally either smaller than for long-term ratings or they disappeared altogether. For example, we found that humor production was more important to women than receptivity, as the latter only had an influence when production was high. This effect, however, was smaller than in the case of long-term partner ratings. Furthermore, we did not find interactions between production and gender, or receptivity and gender, in the case of short-term desirability. This is consistent with Bressler et al. (2006) and Hone et al. (2015) who found that sex differences in humor were present only in the case of long-term relationships but not short-term relationships. Finding stronger effects of the humor manipulations for long-term mating is inconsistent with the fitness indicator hypothesis, as it predicts that genetic factors should be important in both mating contexts. The findings are also inconsistent with the interest indicator view, as it claims that humor is used to convey interest in both long-term and short-term mating contexts. The results are consistent, however, with the encryption hypothesis, which predicts that issues of compatibility should be particularly important in long-term relationships, as it is only therein that cooperation on important tasks is likely to be an issue.

An exception to the finding that effects of humor were more pronounced for long-term partners than short-term partners is the interaction between humor receptivity and attractiveness, which was only marginally significant in the former. Thus, the strongest support for the interest indicator theory came in the case of short-term mating, where the effect of humor receptivity on desirability ratings was evident only for the more attractive individuals. We note, however, that the interest indicator hypothesis also predicts that humor production should boost desirability of attractive individuals more than less attractive individuals, and this result was not borne out in either long-term or short-term contexts. This is the case despite the fact that humor production on its own did cause an increase in desirability in both contexts and did so particularly for females in the case of long-term mating.

Although several studies have examined the effect of humor production and receptivity on mate selection, ours is the first to examine whether humor can also influence ratings of physical attractiveness. The question of whether judgments of physical attractiveness can be affected by nonphysical characteristics has generally been understudied (Kniffin & Wilson, 2004; Swami, 2012). We found that both, high humor production and high humor receptivity, can increase these ratings. Humor production, however, was particularly important for women's ratings of male physical attractiveness, and humor receptivity boosted physical attractiveness ratings only when combined with high humor production. These results are most consistent with the fitness indicator hypothesis, as humor, which is linked to heritable psychological characteristics, caused an increase in desirability.

Finding that humor can influence judgments of physical attractiveness is inconsistent with sequential models of mate selection and cue integration. According to Miller and Todd (1998), for example, cues important to mate selection are not available simultaneously and require different amounts of time to assess. As a result, they cannot be integrated all at once to determine judgments of how desirable someone is as a prospective mate. Instead, they argue that criteria are implemented sequentially, each with a certain threshold level to ascertain whether to continue courtship or to terminate it. Physical attractiveness is the first filter, which determines who one will approach. Only individuals who exceed some threshold for physical attractiveness will be talked to. Other characteristics like intelligence and personality are evaluated later on and require much more time to judge. Some factors will be assessed after a conversation, including intelligence, while other personality characteristics may require much more time.

What our findings show is that such a model is too linear. The information one finds out about an individual, including their sense of humor, can feed back on the original judgment of physical attractiveness and either increase it or decrease it. We found this to be particularly the case for women's ratings of male physical attractiveness, though men's ratings were also influenced by humor. This is consistent with Kniffin and Wilson's (2004) results showing that women's ratings of physical attractiveness of men that they knew were more likely to be influenced by nonphysical information including likeability than were men's ratings of physical attractiveness. The latter's ratings were more similar to the ratings of men who did not know the women. In short, judgments of physical attractiveness encode not just information about a person's heritable physical characteristics, they also integrate information about a person's heritable psychological characteristics.

Taken together, the present results provide the most support for both the fitness indicator and encryption hypotheses. The fitness indicator hypothesis can explain the finding that high humor production and receptivity caused an increase in the desirability of long-term and short-term mates regardless of the physical attractiveness of the individuals, and also why humor was able to increase ratings of physical attractiveness. It can also explain the finding that humor production was more important to women than it was to men. It cannot explain, however, the fact that receptivity was also more important to women than to men, and why generally humor had a stronger effect in long-term mating contexts than short-term mating contexts. The encryption model, in addition to explaining why humor production and receptivity can increase desirability of mates, can also explain why the humor conditions should have a stronger influence in long-term mating contexts than short-term mating contexts. It does not explain, however, why humor production and receptivity were more important to women, and why humor influenced judgments of physical attractiveness. Indeed, Curry and Dunbar (2013) found that although similarity of humor influenced the ratings of affiliation, it did not influence the evaluations of other characteristics of individuals. The view receiving the least support was the interest indicator hypothesis. It was only supported by finding that in the case of short-term mating, humor receptivity had a stronger effect for women rating the more attractive male faces.

To conclude, our study suggests that the most important functions of humor may be to indicate the fitness of prospective mates and their compatibility in terms of shared goals, background knowledge, and values. In a more minor role, humor may serve as an indicator of romantic interest. Given the complexity of humor, it is not surprising to see that it likely plays multiple roles (Galloway, 1994). Of course, it is important to keep in mind that our findings pertain only to the context of mating. Outside of this context, it is quite possible that humor's role as an indicator of fitness may be minimized, while its role as an encrypted indicator of compatibility becomes even more important. After all, just because another person possesses many great heritable characteristics, it does not follow that they will be sufficiently compatible to make cooperation on long-term projects feasible. Moreover, sex differences observed in the context of mating may disappear altogether in other situations such as same-sex friendships.

Appendix A

Humor Preferences Stimuli

Sample high in humor production/low in humor receptivity. Please imagine that you are grocery shopping when this woman

(man) initiates a conversation with you by cracking a joke that makes you laugh. You talk about work as well as your interests. You're having an interesting conversation and you find yourself laughing at her (his) comments several times. You note to yourself that you enjoy her (his) sense of humor and that she (he) seems to like your company. You say something that you think is funny and she (he) smiles friendly at you, but she (he) doesn't laugh at what you've just said. Another customer also laughs at the woman's (man's) joke. The customer make a joking comment that you think is funny, but the woman (man) you are talking to doesn't laugh that much at the comment. Eventually, both of you exchange phone numbers and you consider whether you will call her (him) or not.

Sample high in humor production/high in humor receptivity. Please imagine that you are relaxing by the pool with some friends when this woman (man) comes up to talk to you. She (he) opens up the conversation by saying something that makes you laugh. You say something that you think is very funny and she (he) laughs heartily at what you've just said. You get the impression that this person has a good sense of humor and that she (he) seems to think likewise about your humor considering how much she (he) laughs at your comments. You joke around with each other for a while and you have a very entertaining conversation. She (he) tells you that she (he) has to leave for a meeting and gives you her (his) phone number. You wonder whether you will call her (him) or not.

Sample low in humor production/high in humor receptivity. Please imagine that you are waiting in line to get an ice cream when this woman (man) in front of you starts talking to you. You talk about the beautiful weather as well as what you've been doing earlier that day. You joke around with her (him) and she (he) successfully laughs at what you've just said. You believe that she (he) must enjoy your sense of humor as she (he) repeatedly laughs at your funny statements. Although she (he) laughs at your jokes, you notice that she (he) rarely tries to say funny things and when she (he) does, they aren't very funny. When it's her (his) time to place her order, she (he) gives you her (his) phone number and tells you that it was nice talking to you. As you wait for your turn, you consider whether you will call her (him) or not.

Sample low in humor production/low in humor receptivity. Please imagine that you are having lunch in the school cafeteria when this woman (man) you have never met before comes up to talk to you. As you give her (him) your permission to join you for lunch, you talk about your hometowns, school, and your interests. You are having a natural and easygoing conversation. Although she (he) is talking about things that you find interesting, you note that she (he) doesn't try to crack that many jokes. Moreover, she (he) pays close attention to what you are saying and she (he) smiles at you frequently, but she (he) doesn't laugh very much at your funny comments. Both of you realize that you have to get to class and you exchange phone numbers. On your way to class, you consider whether you will call her (him) or not.

Appendix B

Analysis of Variance (ANOVA) Summary Tables for Ratings of Long-Term Partner Desirability, Short-Term Partner Desirability, and Physical Attractiveness

Table B1. ANOVA Summary Table as a Function of Gender, Physical Attractiveness, Humor Production, and Humor Receptivity on Long-Term Partner Desirability.

	$F(1, 112)$	p	η_p^2
Gender	5.02	.03	.04
Production	53.89	<.001	.33
Receptivity	54.03	<.001	.33
Attractiveness	503.02	<.001	.82
Production × Receptivity	14.78	<.001	.12
Production × Attractiveness	0.37	.54	.003
Production × Gender	3.38	.07	.03
Receptivity × Attractiveness	3.59	.06	.03
Receptivity × Gender	5.13	.03	.04
Attractiveness × Gender	11.64	.001	.09
Production × Receptivity × Gender	13.53	<.001	.11
Production × Attractiveness × Gender	1.97	.16	.02
Receptivity × Attractiveness × Gender	0.68	.41	.006
Production × Receptivity × Attractiveness	0.03	.88	.00
Production × Receptivity × Attractiveness × Gender	0.95	.33	.008

Note. $N = 113$. ANOVA = analysis of variance. Significant at the $p < .05$ level.

Table B2. ANOVA Summary Table as a Function of Gender, Physical Attractiveness, Humor Production, and Humor Receptivity on Short-Term Partner Desirability.

	$F(1, 112)$	p	η_p^2
Gender	10.14	.002	.08
Production	12.10	.001	.10
Receptivity	15.44	<.001	.12
Attractiveness	1,453.09	<.001	.93
Production × Receptivity	4.24	.04	.04
Production × Attractiveness	2.65	.11	.02
Production × Gender	0.09	.77	.001
Receptivity × Attractiveness	7.59	.007	.06
Receptivity × Gender	0.003	.96	.00
Attractiveness × Gender	5.42	.02	.05
Production × Receptivity × Gender	2.99	.09	.03
Production × Attractiveness × Gender	0.51	.48	.004
Receptivity × Attractiveness × Gender	2.21	.14	.02
Production × Receptivity × Attractiveness	0.49	.48	.004
Production × Receptivity × Attractiveness × Gender	1.31	.25	.01

Note. $N = 113$. ANOVA = analysis of variance. Significant at the $p < .05$ level.

Table B3. ANOVA Summary Table as a Function of Gender, Physical Attractiveness, Humor Production, and Humor Receptivity on Ratings of Physical Attractiveness.

	$F(1, 112)$	p	η_p^2
Gender	7.41	.008	.06
Production	102.39	<.001	.48
Receptivity	115.61	<.001	.51
Attractiveness	482.34	<.001	.81
Production × Receptivity	66.94	<.001	.37
Production × Attractiveness	8.29	.005	.07
Production × Gender	4.98	.03	.04
Receptivity × Attractiveness	53.29	<.001	.32
Receptivity × Gender	0.03	.86	.00
Attractiveness × Gender	11.55	.001	.09
Production × Receptivity × Gender	9.93	.002	.08
Production × Attractiveness × Gender	0.39	.53	.003
Receptivity × Attractiveness × Gender	4.91	.03	.04
Production × Receptivity × attractiveness	12.83	.001	.10
Production × Receptivity × Attractiveness × Gender	4.76	.03	.04

Note. $N = 113$. ANOVA = analysis of variance. Significant at the $p < .05$ level.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

Bressler, E. R., Martin, R. A., & Balshine, S. (2006). Production and appreciation of humor as sexually selected traits. *Evolution and Human Behavior*, *27*, 121–130. doi:10.1016/j.evolhumbehav.2005.09.001

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, *100*, 204–232. doi:10.1037/0033-295X.100.2.204

Cowan, M. L., & Little, A. C. (2013). The effects of relationship context and modality on ratings of funniness. *Personality and Individual Differences*, *54*, 496–500. doi:10.1016/j.paid.2012.10.020

Curry, O. S., & Dunbar, R. M. (2013). Sharing a joke: The effects of a similar sense of humor on affiliation and altruism. *Evolution and Human Behavior*, *34*, 125–129. doi:10.1016/j.evolhumbehav.2012.11.003

Didonato, T. E., Bedminster, M. C., & Machel, J. J. (2013). My funny valentine: How humor styles affect romantic interest. *Personal Relationships*, *20*, 374–390. doi:10.1111/j.1475-6811.2012.01410

Dion, K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology*, *24*, 285–290. doi:10.1037/h0033731

Feingold, A. (1990). Gender differences in effects of physical attractiveness on romantic attraction: A comparison across five research paradigms. *Journal of Personality and Social Psychology*, *59*, 981–993. doi:10.1037/0022-3514.59.5.981

Flamson, T., & Barrett, H. C. (2008). The encryption theory of humor: A knowledge-based mechanism of honest signaling. *Journal of Evolutionary Psychology*, *6*, 261–281. doi:10.1556/JEP.6.2008.4.2

Furnham, A. (2009). Sex differences in mate selection preferences. *Personality and Individual Differences*, *47*, 262–267.

Galloway, G. (1994). Psychological studies of the relationship of sense of humor to creativity and intelligence: A review. *European Journal for High Ability*, *5*, 133–144. doi:10.1080/0937445940050203

Gangestad, S. W., Garver-Apgar, C. E., Simpson, J. A., & Cousins, A. J. (2007). Changes in women's mate preferences across the ovulatory cycle. *Journal of Personality and Social Psychology*, *92*, 151–163. doi:10.1037/0022-3514.92.1.151

Gruendl, M. (n.d.). Beautycheck - Schönheit ist messbar! Retrieved from http://www.beautycheck.de.

Hone, L. E., Hurwitz, W., & Lieberman, D. (2015). Sex differences in preferences for humor: A replication, modification, and extension. *Evolutionary Psychology*, *13*, 167–181.

Howrigan, D. P., & MacDonald, K. B. (2008). Humor as a mental fitness indicator. *Evolutionary Psychology*, *6*, 625–666.

Kniffin, K. M., & Wilson, D. S. (2004). The effect of nonphysical traits on the perception of physical attractiveness: Three naturalistic studies. *Evolution and Human Behavior*, *25*, 88–101. doi:10.1016/S1090-5138(04)00006-6

Koranyi, N., Gast, A., & Rothermund, K. (2013). Although quite nice, I was somehow not attracted by that person: Attitudes toward romantically committed opposite-sex others are immune to positive evaluative conditioning. *Social Psychological and Personality Science*, *4*, 403–410. doi:10.1177/1948550612467037

Kuhle, B. X. (2012). It's funny because it's true (because it evokes our evolved psychology). *Review of General Psychology*, *16*, 177–186. doi:10.1037/a0027912

Li, N. P., Griskevicius, V., Durante, K. M., Jonason, P. K., Pasisz, D. J., & Aumer, K. (2009). An evolutionary perspective on humor: Sexual selection or interest indication? *Personality and Social Psychology Bulletin*, *35*, 923–936. doi:10.1177/0146167209334786

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. doi:10.1111/j.1475-6811.1998.tb00174

Lydon, J. E., Meana, M., Sepinwall, D., Richards, N., & Mayman, S. (1999). The commitment calibration hypothesis: When do people devalue attractive alternatives? *Personality and Social Psychology Bulletin*, *25*, 152–161. doi:10.1177/0146167299025002002

McGee, E., & Shevlin, M. (2009). Effect of humor on interpersonal attraction and mate selection. *Journal of Psychology: Interdisciplinary and Applied*, *143*, 67–77. doi:10.3200/JRLP.143.1.67-77

Miller, G. F. (2000). *The mating mind: How sexual choice shaped the evolution of human nature*. New York, NY: Doubleday & Co.

Miller, G. F., & Todd, P. M. (1998). Mate choice turns cognitive. *Trends in Cognitive Sciences*, *2*, 190–198. doi:10.1016/S1364-6613(98)01169-3

Minear, M., & Park, D. C. (2004). A lifespan database of adult facial stimuli. *Behavior Research Methods, Instruments, and Computers*, *36*, 630–633.

Murstein, B. I., & Brust, R. G. (1985). Humor and interpersonal attraction. *Journal of Personality Assessment*, *49*, 637–640. doi: 10.1207/s15327752jpa4906_12

Smith, J. E., Waldorf, V., & Trembath, D. L. (1990). Single White male looking for thin, very attractive . . . *Sex Roles*, *23*, 675–685. doi:10.1007/BF00289255

Swami, V. (2012). Physical attractiveness and personality. *Encyclopedia of Body Image and Human Appearance*, *2*, 622–628. doi:10.1016/B978-0-12-384925-0.00098-5

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

Vettin, J., & Todt, D. (2004). Laughter in conversation. *Journal of Nonverbal Behavior*, *28*, 93–115.

Wilbur, C. J., & Campbell, L. (2011). Humor in romantic contexts: Do men participate and women evaluate? *Personality and Social Psychology Bulletin*, *37*, 918–929. doi:10.1177/0146167211405343