

Fast track report

Red and romantic behavior in men viewing women

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Abstract

In many non-human primate species, a display of red by a female increases attraction behavior in male conspecifics. In two experiments, we investigate an analogous effect in humans, specifically, whether red on a woman's shirt increases attraction behavior in men. In Experiment 1, men who viewed an ostensible conversation partner in a red versus a green shirt chose to ask her more intimate questions. In Experiment 2, men who viewed an ostensible interaction partner in a red versus a blue shirt chose to sit closer to her. These effects were observed across participants' perceptions of their own attractiveness (Experiment 1) and general activation and mood (Experiment 2). Our findings suggest that red acts as a basic, non-lexical prime, influencing reproduction-relevant behavior in like manner across species. Copyright © 2010 John Wiley & Sons, Ltd.

In many non-human primate species, including baboons and chimpanzees, females display red on their body (e.g., chest, genitalia) when nearing ovulation (Dixson, 1983; Gerald, 2003; Setchell & Wickings, 2004). Research has shown that these red displays increase attraction behavior in male conspecifics, as indicated by increased masturbation and mounting attempts (Bielert, Girolami, & Jowell, 1989; Waitt, Gerald, Little, & Krasielburd, 2006). Here we examine whether a display of red by a human female increases attraction behavior in male conspecifics in analogous fashion, substituting red clothing for red chests and genitalia, and question intimacy and physical distance for masturbation and mounting attempts.

Research has yet to be conducted on color and attraction behavior in humans. Recent work by Elliot and Niesta (2008), however, lays the groundwork for such inquiry. Elliot and Niesta (2008) proposed that red on a woman carries the meaning of sex for heterosexual men, and that this red-sex link is a function of two basic, non-independent sources. The first source is conditioning based on the societal use of red across the ages to symbolize lust, passion, and sexuality in ritual, mythology, clothing, and cosmetics (see Greenfield, 2005; Hutchings, 2004; Knight, Powers, & Watts, 1995). This societal use of red is probably not random, but likely emerges from a biological predisposition, shared with our primate relatives, to view female red as a sexual signal. Societal use of red may not only reinforce this biological predisposition, but may extend it beyond natural bodily processes. As such, even an “artificial” red display by a woman, such as red lipstick and rouge, a red shirt or a red light, may be viewed by men as a sexual signal (e.g., a red light symbolizes “open for business” in red-light districts). Elliot and Niesta (2008) provided evidence that red increases men's self-reports of attraction to women, primarily their reports of how attractive they find a woman and how attracted they are to her. Of course, self-reports of cognition and affect with regard to a woman are quite distinct from actual behavior expressing attraction toward a woman, and it is the influence of red on actual behavior that we investigate herein.

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Romantic attraction represents an appetitive response comprised of cognitive, affective, and behavioral components (Berscheid, 1985), and self-reports of cognition/affect are sometimes related and sometimes unrelated to behavioral indicators of attraction (Byrne & Griffitt, 1973; Todd, Penke, Faslo, & Lenton, 2007). In examining color and attraction in humans, there is good reason to begin with self-reports of perception and desire, as they are the most straightforward to acquire and, in many instances, to interpret. However, self-report data have well-known limitations (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), and an examination of behavior represents a more direct test of parallels between human and non-human functioning with regard to attraction. On a broader note, attending to behavior in our research would respond directly to Baumeister, Vohs, and Funder's (2007) impassioned plea in a recent *Perspectives on Psychological Science* article "that social and personality psychology try to put a bit more behavior back into the science of behavior" (p. 401).

Even if a man finds a woman attractive and feels desire toward her, he may not express it behaviorally due to shyness, fear of rejection, the presence of rivals, or a lack of receptivity cues from the woman (Scharlott & Christ, 1995; Vorauer & Ratner, 1996). However, in most cultures societal convention dictates that "men make the first move" (Derlega, Winstead, Wong, & Hunter, 1985), and research indicates that men's strategies for communicating attraction to a woman tend to be quite straightforward and direct (Abbey, 1987; van Straaten, Engels, Finkenauer, & Holland, 2009). In the present research, we conducted two experiments designed to test whether men, like their primate relatives, exhibit more attraction behavior when they see a female conspecific displaying the color red.

EXPERIMENT 1

Experiment 1 examined the effect of red relative to green on men's question asking behavior in an ostensible interaction with a target woman. Green is a stringent contrast to red because it means "go" in traffic lights and tends to have positive associations in general (Adams & Osgood, 1973). Red and green are chromatic colors, so they can be equated on both lightness and chroma in examining the effect of hue. In heterosexual interactions, an early behavioral sign of attraction is asking more intimate (i.e., forward) questions of the other individual (Reis & Shaver, 1988), and in this experiment we examined whether men viewing a target woman in red (relative to green) would choose to ask her more intimate questions. A secondary aim of this experiment was to test whether the red effect would hold across participants' perceptions of their own attractiveness. Self-perceived attractiveness can exert a powerful influence on one's behavior toward members of the opposite sex (Buston & Emlen, 2003; Clark, 2004), therefore, documenting the red effect over and above such perceptions would be a particularly compelling demonstration of the power of red.

Method

Participants, Design, and Procedure

Twenty-three male US undergraduates participated for extra course credit.¹ Participation in this and the subsequent experiment was restricted to individuals who were hetero- or bisexual, and did not have an experiment-relevant color deficiency. The mean age of participants was 19.34 years old (range = 18–21). Participant ethnicity was as follows: 17 Caucasian, 3 Asian, and 3 "other." Participants were randomly assigned to one of two between-subjects color conditions: the red condition ($n = 12$) or the green condition ($n = 11$). The experimenters in this and the subsequent experiment were blind to participant condition and the hypotheses.

Procedure and Materials

Participants were informed that the experiment was set up to imitate an online conversation and was about communicating with a woman by exchanging questions. They were told that the two participants would only see a photo of each other. The experimenter then took the participant's photo with a digital camera, and left the room to ostensibly exchange the photo

¹Three individuals reported that they had heard the experiment was about shirt color and attraction. These individuals were not included in the analyses.

with that of the other participant. Upon returning, the experimenter gave the participant a manila folder containing the photo of the other participant, which was a colored picture of a woman wearing a red or green shirt. Participants were instructed to open the folder and to look at the photo for 5 seconds. When 5 seconds had elapsed, participants were given a separate folder containing 24 questions printed on individual note cards, and were instructed to choose five of the questions that would then be given to the other participant; the questions varied in degree of attraction-relevant intimacy. The experimenter then left the room to ostensibly retrieve the five questions selected by the other participant. Upon returning, the experimenter informed the participant that the experiment was now over, and that his questions would not actually be given to the ostensible other participant. The participant then completed a questionnaire containing demographics items, and was subsequently debriefed and dismissed.

The female photo was a 4" × 6" yearbook-like head and upper torso shot of a moderately attractive young adult woman with blond hair and blue eyes from a local university. She wore a long-sleeved T-shirt and had a pleasant smile on her face. In a pilot test with a separate sample of 12 men, this woman received a mean attractiveness rating of 5.63 ($SD = 1.85$) on a 1 (not at all attractive) to 9 (extremely attractive) scale. For the experiment, the female photo was centered on an 8.5" × 11" page, and color was manipulated by varying the color on the shirt of the woman. In both the red and green conditions, Adobe Photoshop was used to manipulate the color of the shirt before the photo was printed on Epson Enhanced Matte white paper with an Epson Stylus Photo R800 color printer. The colors for the manipulation were selected using the CIELCh color model and a GretagMacBeth Eye-One Pro spectrophotometer. A trial and error process was used to find standard red and green colors that were equated on lightness and chroma. The parameters for the printed red were LCh(50.3, 47.0, 25.0) and for the printed green were LCh(50.4, 46.9, 141.2).

Measures

We generated a set of 24 conversation questions ranging in degree of attraction-relevant intimacy from low ("Where are you from?") to moderate ("Where do you normally hang out?") to high ("How could a guy [I] get your attention at a bar?"). These questions were given to a separate sample of 12 men, along with the following instructions: "Please read the following questions. While reading them, imagine you are going to have an online conversation with a female after simply seeing her picture for the first time. Below are questions that you might want to ask her. Please rate the intimacy level of each question." Participants made their ratings on a 1 (not at all intimate) to 9 (extremely intimate) scale. Each question was thus associated with a mean value for attraction-relevant intimacy. In the actual experiment, the mean value for participants' five selected questions was summed to form a question intimacy measure.

Perceptions of own attractiveness were assessed by asking participants "How attractive do you think most persons of the opposite sex find you?" on a 1 (not at all attractive) to 9 (extremely attractive) scale.

Results and Discussion

An independent samples *t*-test was used to examine the effect of color condition (red vs. green) on question intimacy. The analysis revealed a significant effect of color, $t(21) = 2.08$, $p < .05$, $d = .91$. As displayed in Figure 1, participants in the red condition chose to ask the target woman more intimate questions ($M = 19.27$, $SD = 3.05$) than did those in the green condition ($M = 16.60$, $SD = 3.10$).

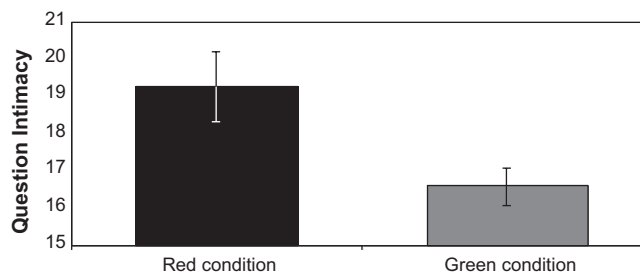


Figure 1. Question intimacy as a function of color condition in Experiment 1. Confidence intervals (95%) are indicated by vertical lines

Next, we conducted a simultaneous multiple regression analysis with color condition, own attractiveness, and the product term as predictors of question intimacy. The effect of color remained significant, $F(1, 19) = 4.19, p \leq .05, d = .94$, whereas neither the main nor the interactive effect of perceptions of own attractiveness attained significance.

In sum, the results from this experiment supported our hypothesis. Men who viewed a woman dressed in red, relative to green, asked her more intimate questions. This effect was not moderated by participants' perceptions of their own attractiveness.

EXPERIMENT 2

In Experiment 2, we examined the effect of red relative to blue on how close men sit to a target woman in an ostensible interaction with her. Like green, blue is a stringent contrast to red, because it is the most popular color in studies of adult color preference (McManus, Jones, & Cottrell, 1981). Also like green, blue is a chromatic color, so red and blue can be equated on both lightness and chroma in examining hue. In heterosexual interactions, a clear behavioral sign of attraction is movement toward close physical proximity (Hatfield, 1984), and in this experiment we examined whether men viewing a target woman in red (relative to blue) would choose to sit more closely to her. Physical distance preferences increase gradually with age before asymptoting in the early 20s (Hayduk, 1983; Price & Dabbs, 1974); accordingly, age was used as a covariate in this experiment. A secondary aim of this experiment was to test whether the red effect would hold when controlling for participants' mood and general activation. If, as some have posited (Goldstein, 1942; Soldat, Sinclair, & Mark, 1997), red boosts positive mood and general activation, it could increase appetitive behavior in a general, indiscriminant fashion, as opposed to increasing romantic attraction *per se*. Documenting the red effect independently of mood and general activation would rule out this alternative explanation.

Method

Participants and Design

Twenty-two male US undergraduates participated for extra course credit.² The mean age of participants was 19.79 years old (range = 18–22). Participant ethnicity was as follows: 13 Caucasian, 1 African American, 6 Asian, 1 Hispanic, and 1 “other.” Participants were randomly assigned to one of two between-subjects color conditions: the red condition ($n = 12$) or the blue condition ($n = 10$).

Procedure and Materials

Participants were informed that the experiment involved having a 5 minute conversation with a person of the opposite sex. They were told that they would be shown a photo of a woman, asked some questions, and then taken to another room to have a conversation with the woman. The experimenter then took a photo of the male participant with a digital camera, and left the room to ostensibly exchange the participant's photo with that of the other participant. Upon returning, the experimenter gave the participant a manila folder containing the photo of the other participant, which was a colored picture of a woman wearing a red or blue shirt. Participants were instructed to open the folder, look at the photo for 5 seconds, and then answer two questions about their present feelings.

The experimenter then escorted the participant to the conversation room which contained two chairs. One chair was positioned on the left side of the room facing outward, and the other was positioned on the right side of the room facing a table. The experimenter stated that the other participant is always placed “here” (pointing to the chair facing outward), and continued “Go ahead and grab a chair and sit across from her” (pointing to the chair facing the table). When the participant was seated, the experimenter exited to ostensibly get the other participant. Shortly thereafter, the experimenter returned saying that the other participant got a call on her cell phone and had to leave. The experimenter then escorted the participant back to the initial room, and had him complete a questionnaire containing demographics items. Participants

²One individual reported awareness that the experiment focused on where participants position their chair, and another indicated that he had heard that the women does not actually appear. These individuals were not included in the analyses.

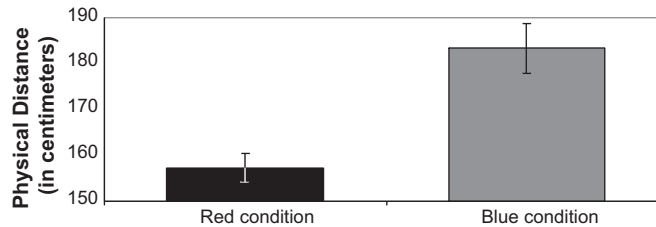


Figure 2. Physical distance in centimeters as a function of color condition in Experiment 2. Means are adjusted for age of participant. Confidence intervals (95%) are indicated by vertical lines

were then debriefed and dismissed, and the experimenter returned to the conversation room and measured the distance between the two chairs (focusing on the part of the participant's chair closest to the ostensible participant's chair).

The female photo was a 3'' × 6'' yearbook-like head and upper torso shot of a moderately attractive young adult woman with brown hair and brown eyes that was downloaded from the popular website HotoNot.com. She wore a plain form-fitting shirt and had a neutral expression on her face. In a pilot test with a separate sample of 15 men, this woman received a mean attractiveness rating of 6.80 ($SD = 1.32$) on a 1 (not at all attractive) to 9 (extremely attractive) scale. For the experiment, the female photo was centered on an 8.5'' × 11'' page, and color was manipulated by varying the color on the shirt of the woman. In both the red and blue conditions, Adobe Photoshop was used to manipulate the color of the shirt before the photo was printed on Epson Enhanced Matte white paper with an Epson Stylus Photo R800 color printer. The colors for the manipulation were selected using the CIELCh color model and a GretagMacBeth Eye-One Pro spectrophotometer. A trial and error process was used to find standard red and blue colors that were equated on lightness and chroma when printed. The parameters for the printed red were LCh(45.9, 54.8, 32.5) and for the printed blue were LCh(46.0, 54.9, 283.0).

Measures

The distance in centimeters between the participant's chair and the (ostensible) other participant's chair was used as the measure of physical distance. Mood was assessed with Greitemeyer's (2009) single-item measure "How do you feel right now?," answered on a 1 (very bad) to 9 (very good) scale. General activation was assessed with the item "How energetic do you feel right now?," answered on a 1 (not at all) to 4 (very) scale; this item is the highest loader on Thayer's (1986) general activation measure.

Results and Discussion

An ANCOVA was used to examine the effect of color condition (red vs. blue) on physical distance with age as a covariate. The analysis revealed a significant effect of color, $F(1, 19) = 4.67$, $p < .05$, $d = .99$. As displayed in Figure 2, participants in the red condition ($M_{\text{adjust}} = 157.30$, $SD = 27.90$) sat closer to the target women's chair than did those in the blue condition ($M_{\text{adjust}} = 183.30$, $SD = 31.80$). A positive trend was observed for age, $F(1, 19) = 2.82$, $p < .11$, $d = .77$, indicating that older participants tended to sit farther from the target woman's chair³.

Next, we repeated the initial analysis controlling for mood and general activation. The effect of color remained significant, $F(1, 17) = 4.80$, $p < .05$, $d = 1.06$, and the positive trend for age became marginally significant, $F(1, 17) = 3.20$, $p = .09$, $d = .87$. No effect of mood or general activation was observed⁴.

³The effect of color condition on physical distance without age as a covariate was $F(1, 20) = 3.54$, $p = .07$, $d = .84$.

⁴There is little behavioral evidence for ethnic differences in interpersonal distance (see Hayduk, 1983), especially among cross-ethnicity dyads. Nevertheless, given the common perception that such differences exist, we conducted additional analyses controlling for ethnicity. There were five non-Caucasian participants (3 Asian, 1 African American, 1 Hispanic) in the red condition and four non-Caucasian participants (3 Asian, 1 "other") in the blue condition, and we controlled for ethnicity two different ways: Caucasian vs. non-Caucasian and Asian vs. non-Asian. All of the effects of color condition reported in the text remained significant in these analyses controlling for ethnicity.

In sum, the results from this experiment supported our hypothesis and conceptually replicated Experiment 1. Men who viewed a woman dressed in red, relative to blue, sat closer to where they thought she was about to sit. This effect was shown to be independent of mood and general activation.

GENERAL DISCUSSION

The vast majority of research on attraction over the years has focused on affect and cognition (Orbuch & Sprecher, 2003). Behavioral indicators of attraction have been relatively scarce in the literature (see Byrne & Griffitt, 1973; Snyder & Endleman, 1979), although there has been a recent influx of research utilizing naturalistic paradigms (online dating, speed dating) highly amenable to investigating romantic behavior (Finkel & Eastwick, 2008; McKenna, Gree, & Gleason, 2002). Herein we conducted two experiments using two different behavioral indicators of attraction, question intimacy and physical distance, both of which produced the same finding: Men showed, in their actions, that they were particularly attracted to the “lady in red” (versus the lady in green or blue). Importantly, this effect was observed using stringent color controls that allowed us to clearly establish that the effect is due to hue, not lightness or chroma.

Our findings were obtained across participants’ perceptions of their own attractiveness, and were independent of mood and general activation. Thus, the amorous power of red is operative for those with low, as well as high, views of their “market value” (Pawlowski & Dunbar, 1999), and the red effect cannot be attributed to domain general affect- and arousal-based processes. Nevertheless, it should be noted that we did not test the gender-specificity of our findings, which leaves room for alternative explanations. For example, stimuli containing long wavelength colors such as red appear to be slightly nearer to the perceiver than achromatic or short wavelength stimuli (due to differences in light refraction in the lens of the eye; Marcos, Burns, Moreno-Barriso, & Navarro, 1999), and closer stimuli are preferred by perceivers of both sexes (Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005; Williams & Bargh, 2008). Additional research demonstrating that the effects documented herein are specific to male behavior toward females is needed to rule out such gender-general possibilities.

The present research was designed to test a provocative effect of perceiving the color red on behavior, not to test the origins of this effect. Our findings are in line with an evolutionary perspective on human attraction, and the parallels between men and their more primitive male counterparts in their behavioral response to female red are undeniably striking. Indeed, the fact that our findings involve actual behavior (and, most notably, freely enacted behavior in Experiment 2), rather than self-reported preferences, may be seen as a particularly direct and, therefore, provocative demonstration of these parallels (see Elliot, Maier, Binser, Friedman, & Pekrun, 2009, for a parallel argument in a different domain). Nevertheless, societal factors may also be responsible for this effect. Indeed, our preferred explanation is that the red effect is due to a biologically based predisposition that is both reinforced and extended by social learning (see Simpson and Gangstead (2001), on the compatibility of social- and biologically based levels of explanation). A considerable amount of additional research is needed before questions regarding the origins of the red effect can be answered; one promising place to begin would be to explore the degree to which red on women evokes romantic behavior in men across diverse cultures. A limitation of our experiments is that our sample of target persons comprised only two females, albeit females with different hair color and eye color; future work is needed to extend the findings to a broader sampling of female targets.

Beyond the conceptual and empirical, our findings have direct applied implications. It appears that women would do well to wear a red shirt or dress when preparing for a date with a desirable man, and women may be particularly successful in online dating when they post a picture of themselves in red apparel. More generally, our findings should be of considerable interest to fashion consultants and product designers, as well as marketers and advertisers.

In conclusion, our research shows, for the first time, that color influences men’s behavior toward women in the romantic realm. Color, specifically red, appears to serve as a basic, non-lexical prime that can influence important (i.e., reproduction-relevant) behavior in similar fashion across species.

REFERENCES

- Abbey, A. (1987). Misperceptions of friendly behavior as sexual interest: A survey of naturally occurring instances. *Psychology of Women Quarterly*, 11, 173–194.
- Adams, F. M., & Osgood, C. E. (1973). A cross-cultural study of the affective meaning of color. *Journal of Cross-Cultural Psychology*, 4, 135–156.
- Baumeister, R. F., Vohs, K. D., & Funder, D. C. (2007). Psychology as the science of self-reports and finger movements: Whatever happened to actual behavior? *Perspectives on Psychological Science*, 2, 396–403.
- Berscheid, E. (1985). Interpersonal attraction. In G. Lindzey, & E. Aronson (Eds.), *Handbook of social psychology* (pp. 413–484). New York: Random House.
- Bielert, C., Girolami, L., & Jowell, S. (1989). An experimental examination of the color component in visually mediated sexual arousal of the male chacma baboon (*Papio ursinus*). *Journal of the Zoological Society of London*, 219, 569–579.
- Buston, P. M., & Emlen, S. T. (2003). Cognitive processes underlying human mate choice: The relationship between self-perception and mate preference in Western society. *Proceedings of the National Academy of Sciences*, 100, 8805–8810.
- Byrne, D. M., & Griffitt, W. (1973). Interpersonal attraction. *Annual Review of Psychology*, 24, 317–336.
- Clark, A. (2004). Self-perceived attractiveness and masculinization predict women's sociosexuality. *Evolution and Human Behavior*, 25, 113–124.
- Derlega, V. J., Winstead, B. A., Wong, P., & Hunter, S. (1985). Gender effects in an initial encounter: A case where men exceed women in disclosure. *Journal of Social and Personal Relationships*, 2, 25–44.
- Dixon, A. F. (1983). Observations on the evolution and behavioral significance of “sexual skin” in female primates. *Advances in the study of behavior*, 13, 63–106.
- Elliot, A. J., Maier, M. A., Binser, M. J., Friedman, R., & Pekrun, R. (2009). The effect of red on avoidance behavior. *Personality and Social Psychology Bulletin*, 35, 365–375.
- Elliot, A. J., & Niesta, D. (2008). Romantic red: Red enhances men's attraction to women. *Journal of Personality and Social Psychology*, 95, 1150–1146.
- Finkel, E. J., & Eastwick, P. W. (2008). Speed-dating. *Current Directions in Psychological Science*, 17, 193–196.
- Gerald, M. (2003). How color may guide the primate world: Possible relationships between sexual selection and sexual dichromatic. In C. Jones (Ed.), *Sexual selection and reproductive competition in primates: New perspectives and directions*. Norman, OK: American Society of Primatologists.
- Goldstein, K. (1942). Some experimental observations concerning the influence of colors on the functioning of the organism. *Occupational Therapy and Rehabilitation*, 21, 147–151.
- Greenfield, A. B. (2005). *A perfect red: Empire, espionage, and the quest for the color of desire*. New York: HarperCollins Books.
- Greitemeyer, T. (2009). The effect of anticipated affect on persistence and performance. *Personality and Social Psychology Bulletin*, 35, 172–186.
- Hatfield, E. (1984). The dangers of intimacy. In V. Derlega (Ed.), *Communication, intimacy, and close relationships* (pp. 207–220). New York: Academic.
- Hayduk, L. A. (1983). Personal space: Where we now stand. *Psychological Bulletin*, 94, 293–335.
- Hutchings, J. (2004). Color in folklore and tradition—The principles. *Color Research and Application*, 29, 57–66.
- Knight, C., Power, C., Watts, I. (1995). The human symbolic revolution: A Darwinian account. *Cambridge Archaeological Journal*, 5, 75–114.
- Marcos, S., Burns, S.A., Moreno-Barriusop, E., Navarro, R., (1999). A new approach to the study of ocular chromatic aberrations. *Vision Research*, 39, 4309–4323.
- McKenna, K. Y. A., Gree, A. S., & Gleason, M. J. (2002). Relationship formation on the Internet: What's the big attraction? *Journal of Social Issues*, 58, 9–32.
- McManus, I. C., Jones, A. L., & Cottrell, J. (1981). The aesthetics of color. *Perception*, 10, 651–666.
- Niedenthal, P. M., Barsalou, L. W., Winkelman, P., Krauth-Gruber, S., & Ric, F. (2005). Embodiment in attitudes, social perception, and emotion. *Personality and Social Psychology Review*, 9, 184–211.
- Orbuch, T., & Sprecher, S. (2003). Attraction and interpersonal relationships. In J. DeLamater (Ed.), *Handbook of social psychology: Sociological perspectives* (pp. 339–362). New York: Kluwer-Plenum.
- Pawlowski, B., & Dunbar, R. (1999). Impact of market value on human mate choice. *Proceedings of the Royal Academy of London*, B, 266, 281–285.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J., & Podsakoff, N. P. (2003). Common method variance in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879–903.
- Price, G. H., & Dabbs, J. M. (1974). Sex, setting, and personal space: Changes as children grow older. *Personality and Social Psychology Bulletin*, 1, 362–363.
- Reis, H. T., & Shaver, P. (1988). Intimacy as an interpersonal process. In S. W. Duck (Ed.), *Handbook of personal relationships* (pp. 367–389). Chichester, England: Wiley.
- Scharlott, B., & Christ, W. G. (1995). Overcoming relationship-initiation barriers: The impact of a computer-dating system on sex roles, shyness, and appearance inhibitions. *Computers in Human Behavior*, 11, 191–204.

- Setchell, J. M., & Wickings, E. J. (2004). Sexual swellings in mandrills (*Mandrillus sphinx*): A test of the reliable indicator hypothesis. *Behavioral Ecology*, 15, 438–445.
- Simpson, J. A., & Gangestad, S. W. (2001). Evolution and relationships: A call for integration. *Personal Relationships*, 8, 341–355.
- Soldat, A. S., Sinclair, R. C., & Mark, M. M. (1997). Color as an environmental processing cue: External affective cues can directly affect processing strategy without affecting mood. *Social Cognition*, 15, 55–71.
- Snyder, C. R., & Endleman, J. R. (1979). Effects of degree of interpersonal similarity on physical distance and self-reported attraction. *Journal of Personality*, 47, 492–505.
- Thayer, R. E. (1986). Activation-deactivation adjective check list: Current overview and structural analysis. *Psychological Reports*, 58, 607–614.
- Todd, P. M., Penke, L., Fasolo, B., & Lenton, A. P. (2007). Different cognitive processes underlie human mate choices and mate preferences. *Proceedings of the National Academy of Sciences*, 104, 15011–15016.
- van Straaten, I., Engels, R., Finkenauer, C., & Holland, R. W. (2009). Meeting your match: How attractiveness similarity affects approach behavior in mixed-sex dyads. *Personality and Social Psychology Bulletin*, 35, 685–697.
- Vorauer, J. D., & Ratner, R. K. (1996). Who's Going to Make the First Move? Pluralistic ignorance as an impediment to relationship formation. *Journal of Social and Personal Relationships*, 13, 483.
- Waitt, C., Gerald, M. S., Little, A. C., & Krasieburd, E. (2006). Selective attention toward female secondary sexual characteristics. *American Journal of Primatology*, 68, 738–744.
- Williams, L.E., Bargh, J.A. (2008). Keeping one's distance: The influence of spatial distance cues on affect and evaluation. *Psychological Science*, 19, 302–308.

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