EXPLORING MATE PREFERENCES FROM AN EVOLUTIONARY PERSPECTIVE USING A SPEED-DATING DESIGN

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ABSTRACT

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Evolutionary approaches suggest that the mate selection process is ultimately driven by the desire to successfully pass on one's genes, such that each individual is trying to maximize his or her reproductive fitness when choosing a mate. According to evolutionary theory, factors that enhance reproductive fitness (e.g., health, certain personality attributes) should influence one's mate value. For example, individuals who appear to be kind may have a higher mate value. However, existing research has not examined whether these qualities enhance one's mate value upon first meeting. Using a speed-dating design, a sample of 387 previously unacquainted men and women were asked to get to know one another in pairs and then asked to make ratings of one another on a variety of variables. These ratings were used as an indication of romantic interest and mate value. Participants were also measured on a number of individual-level variables thought to influence mate value such as personality, psychopathology, physical dimensions, observer ratings of physical attractiveness, and for women, the stage of their menstrual cycle. Using the Social Relations Model, ratings of romantic interest during the speed-dating study were correlated with the individual-level variables in order to examine whether certain individual-level variables were associated with greater perceived romantic interest and thereby served to enhance mate value. Results revealed that college-aged men were more interested in women who were outgoing, prone to rule-breaking behavior, and physically attractive, whereas college-aged women were typically interested in men who were low on neuroticism and internalizing psychopathology and were more assertive. Results generally suggest that

participants seem to select potential mates on some characteristics related to long term mate value but also on some characteristics that may primarily be valuable for short term mating strategies.

Dedicated to my father, Niranjan, the first Dr. Humbad.

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CHAPTER ONE
INTRODUCTION

Evolutionary theories of mate selection posit that individuals select romantic partners so as to maximize their ability to pass genes to their offspring. This theory stems largely from Darwin's theories of natural selection and sexual selection (Darwin, 1859; 1871). Darwin not only proposed the notion of reproductive fitness (i.e., the importance of surviving to produce offspring that produce their own offspring), but he also developed the concepts of intrasexual and intersexual selection. Intrasexual selection refers to same-sex competition, or the tendency for members of a given sex to compete with one another for access to members of the opposite sex. Intersexual selection is more commonly called mate selection, or the tendency to preferentially select partners with particular qualities. Inherent in the theory of intersexual selection is the idea that men and women seek out different types of qualities. Indeed, evolutionary theory suggests that men should prefer to seek out multiple mates that are young and healthy (and therefore, most fertile) to increase their chances of having offspring that will survive (e.g., Buss & Schmitt, 1993; Schmitt, 2008). Youth and health are often determined based on physical appearance, which has indeed been found to be correlated with the likelihood to date, marry, and reproduce (Jones, 1996). Women, by contrast, should prefer mates that will best provide resources for their children in order to maximize the chances that their offspring will survive. As such, indicators of personality, intelligence, and status may play an important role in their selection of a mate.

Although mate selection is commonly thought of as a long term decision (e.g., resulting in marriage), mating relationships are not limited to this definition. Short term mating (i.e., a brief or one-time sexual encounter) is not uncommon, and is theorized to involve somewhat different selection considerations than those relevant for a longer term partner. Short term mating

strategies are considered beneficial for men, because they may increase the likelihood of having multiple offspring (Buss & Schmitt, 1993). They may be useful strategies for women if the woman is having difficulty securing a long term, high quality mate, or if the woman is using short term mating as a strategy to assess potential long term mating prospects and identify both her own and her partner's mate value (Buss & Schmitt, 1993; Greiling & Buss, 2000). Regardless, the qualities which individuals find appealing in a potential mate may differ when considering a short term versus long term relationship. Generally, existing research has found that both men and women place emphasis on physical appearance when considering a short term mate, and although this preference remains for men considering a long term mate; for women, good earning potential tends to become a stronger preference (Li, 2007; 2008). Although men continue to place value on physical appearance, for both men and women, qualities that would enhance one's ability to be a successful parent become increasingly important (Li & Kenrick, 2006). Thus it seems that overall, in order for an individual to have a high mate value, it is likely that he or she would need to possess many of the above characteristics according to evolutionary theory.

One important empirical question concerns whether these indicators of reproductive fitness increase mate value *upon first meeting*. That is, are individuals immediately attracted to potential mates who have characteristics that would be indicative of greater reproductive fitness? Evolutionary theory has suggested that certain personality traits may enhance one's mate value. For example, an individual may be more likely to be approached by a potential mate if he or she is warm, outgoing, and friendly, as opposed to appearing cold, angry, or aloof. But would this kind of individual be perceived as more attractive right away? Little to no research has examined this question, and as such, it remains unclear whether the characteristics associated

with a higher mate value matter when making initial judgments of attraction. It could be argued that both survival and reproductive fitness are enhanced by the ability to quickly and accurately identify attributes that indicate physical health and individual difference attributes linked to parental investment. Consistent with this idea, existing literature suggests humans appear to make almost instantaneous judgments of one another in terms of physical appearance, personality, behaviors, etc., even when using only "thin slices" of behavior (i.e., short video/audio clips; Ambady & Skowronski, 2008). These first impressions are necessarily imperfect; however, given how quickly they are made, they are surprisingly accurate. The current study therefore aims to use a speed-dating design to examine whether or not the characteristics thought to enhance reproductive fitness and mate value are considered more attractive upon first meeting.

Physical Indicators of Reproductive Fitness

According to evolutionary theory, characteristics in the opposite sex that represent good health are key indicators of reproductive fitness. More specifically, the theory proposes that women are most attracted to characteristics in men representing strength, ambition, and good health, whereas men are most attracted to characteristics representing youth (e.g., age) and good health in women and are less concerned with ambition and strength. The value placed on these traits has been found consistently across cultures (Shackelford, Schmitt, & Buss 2005). Researchers have examined several indicators which they believe represent these traits including physical appearance and body shape. These indicators are thought to be markers of reproductive fitness.

Physical Appearance. There are several reasons why physical appearance may increase mate value. One is that individuals who are perceived to be more physically appealing have also

been considered (rightly or wrongly) to be more likable, outgoing, have higher intelligence, better health, and exert greater social power (Feingold, 1992; Langlois et al., 2000; Zebrowitz & Rhodes, 2004). Indeed, Langlois et al. (2000) found that more attractive children and adults are treated more positively by others, even by those who know them. Thus, physical appearance may be related to evaluative biases that might not be directly linked with qualities associated with reproductive success and parenting.

Alternately, physical appearance may itself be an indicator of physical health, particularly before advances in medicine and cosmetic surgery were readily available. As it stands, however, evidence supporting the link between physical appearance and actual health outcomes is mixed (Honekopp, Rudolph, Beier, Liebert, & Muller, 2007; Peters, Rhodes, & Simmons, 2007; Shackelford & Larsen, 1999; Thornhill & Gangestad, 2006). For example, one study found a link between male semen quality and facial attractiveness (i.e., more attractive faces had higher mate quality; Soler et al., 2003) but another study found no such link (Peters et al., 2007). Thus, physical appearance may serve to influence our impressions of others as well as our behaviors towards others, but it may not be as salient of a cue for actual health problems. Indeed, the lack of consistent findings linking physical health and physical appearance may be because physical flaws caused by disease and illness are not as prevalent in the modern Western world.

Body Shape. In line with physical appearance, body shape may be indicative of numerous health outcomes and reproductive capabilities. A common indicator of perceived attractiveness of a woman's body shape is the Waist-to-Hip Ratio (WHR; Singh, 1993, 1994). A WHR value of .7 is theorized to be most appealing, because it is considered to be the degree of fat distribution that maximizes the ability to bear healthy children. In addition, low WHR paired with larger breasts has also been found to be associated with higher levels of hormones involved

in reproduction (i.e., 17-β-oestradiol (E2) and progesterone (Jasienska, Ziomkiewicz, Ellison, Lipson, & Thune, 2004). Women with a WHR of .7 may be of different weights, but they have smaller waists than hips, appearing more "pear-shaped" than "apple-shaped." Indeed, many beauty icons (e.g., Marilyn Monroe) are thought to have a .7 WHR.

Existing research has generally found a positive relationship between physical attractiveness and lower WHR (Furnam, Swami, & Shah, 2006 report an effect size of 0.52 between WHR and attractiveness; Schmalt, 2006; Singh, 1993, 1994, 1995). Indeed, low WHR in women is also related to a number of health outcomes including a lower risk of heart disease, stroke, type II diabetes, and various cancers (Singh & Randall, 2007). Thus, low WHR is associated with both physical appearance and health outcomes.

Importantly, however, there is some controversy regarding whether WHR is as important for attractiveness ratings as other measures. Some researchers have found that WHR is less important in perceptions of attractiveness than the Body Mass Index (BMI) or body weight (Swami, Greven, & Furnham, 2007; Wilson, Tripp, & Boland, 2005). However, the methods used in these studies vary quite drastically such that some studies have individuals provide ratings of attractiveness of line drawings while others use actual photographs. No study to date has examined whether WHR influences perceptions of attractiveness when assessed in-person during the course of thin-slice interactions. Existing research has examined body weight and BMI in relation to in-person attractiveness ratings, but no study has examined the WHR in a speed-dating paradigm. In such a case, individuals would provide ratings of attractiveness of others upon meeting them for the first time, and then these ratings would then be compared to their WHR and body weight. This method would offer a more naturalistic approach for assessing

attractiveness in the context of real human interaction rather than using attractiveness ratings based solely on photographic images.

For men, muscular bodies are considered most appealing (e.g., Braun & Bryan, 2006; Frederick & Haselton, 2007). Singh (1994) noted healthy men generally have more fat deposited on their abdomens and upper body (i.e., shoulders, arms, neck), which is indicative of better fitness and health. Similar to the WHR in women, the fat distribution in men is primarily studied through the waist-to-shoulder ratio (WSR) or the shoulder-to-hip ratio (SHR) which are both heavily influenced by sex hormone production (i.e., testosterone). Evolutionary theory hypothesizes WSR and SHR should be related to both masculinity and attractiveness, and in particular, broad shoulders with a small waist and hips (i.e., the v-shaped body; a smaller WSR and larger SHR) should suggest greater physical strength and dominance (i.e., greater testosterone and personality characteristics denoting reproductive fitness).

Research in this area has found the body shape of men seems to matter more to women in the short term than the long term, such that a smaller WSR and being more muscular are perceived as more attractive by women when considering a short term mate instead of a long term mate (Braun & Bryan, 2006; Frederick & Haselton, 2007). It may also be the case that the "v-shaped" body is simply more important for younger men than older men (Buunk & Dijkstra, 2005), given that younger men may be more cognizant of body shapes resembling the "best" fitness when they are at the peak of their own health. Indeed, some research suggests that masculinity mediates the relationship between physical fitness and body attractiveness, suggesting that masculinity provides additional information above and beyond physical fitness in perceptions of attractiveness (Honekopp et al., 2007). As with women's body shape, research examining men's body shape similarly relies on ratings of bodies through photographs or line

drawings. Although this method of assessing body shape is informative, rating individuals for attractiveness after actual in-person meetings may help in identifying whether certain body indicators are truly related to selection and attraction processes.

Personality and Psychopathology as Indicators of Reproductive Fitness

It would seem to be advantageous to be able to quickly recognize whether someone is kind, intelligent, emotionally stable, and responsible. Traits of warmth, intelligence, and responsibility are valued by individuals seeking long term relationships, in part because these traits are considered markers of a good parent (Buss & Schmitt, 1993). Research on first impressions of personality traits suggest that observers are reasonably accurate at identifying traits of warmth, extraversion, and sometimes even conscientiousness at zero-acquaintance (i.e., an exposure to someone with whom the rater is not previously acquainted) using even thin-slices of behaviors lasting one minute (e.g., Carney, Colvin, & Hall, 2004; DePaulo et al., 1987; Marcus & Lehman, 2002). Indeed, Ambady, Bernieri, and Richeson (2000) report a correlation of $r = .2$ for overall accuracy when evaluating others' personality traits from thin slices (i.e., raters perceptions of personality traits of targets were generally in line with targets' self-reports of personality). The ability to accurately identify personality traits in initial interactions may play a role in mate selection such that it may allow humans to "weed out" potentially harmful partners. For example, a person viewed as being cold and distant may not invest heavily in offspring. These traits may therefore not be considered as appealing as being warm and friendly when considering potential mates from an evolutionary perspective.

In addition to being able to judge personality traits in others relatively quickly, it would also be important for humans to quickly identify potentially maladaptive traits or psychopathology during initial encounters. Extant research has found that individuals are able to

accurately identify whether or not strangers have personality disorders, psychopathic personality traits, or are even likely to cheat or deceive us (e.g., Friedman, Oltmanns, & Turkheimer, 2007; Oltmanns, Friedman, Fiedler, & Turkheimer, 2004; Porter & ten Brinke, 2008; Porter, England, Juodis, ten Brinke, & Wilson, 2008). For example, Friedman et al. (2007) found that based on 30-second behavior clips of undergraduates meeting probable or definite criteria of a personality disorder, there was a high degree of consensus between raters and the targets' self or peer-reports of personality disorders. Although it was more difficult for raters to identify the specific personality disorder, they were able to discern which individuals had personality disorders based on the short clip. Thus, overall, first impressions of a wide array of personality traits allow observers to relatively accurately select potential partners that will maximize chances of having offspring that are able to survive to reproduce themselves.

Influences of the Menstrual Cycle on Mate Preferences

Recent research has found that women's preferences in mates vary across their menstrual cycle (e.g., Gangestad & Thornhill, 1998; Gangestad, Garver-Apgar, Simpson, & Cousins, 2007). Evolutionary theory explains that these variations occur because women should prefer markers of genetic benefits (e.g., masculinized male features such as muscularity and physical strength which develop in response to high levels of testosterone) particularly when they are fertile (see Gangestad et al., 2007). Moreover, the theory predicts that these preferences will only emerge when women are considering short term (i.e., a one night stand or brief sexual encounter) relationships versus long term relationships. The reason for this prediction is that women who are considering a long term mate should prefer markers in men that increase genetic benefits *as well as* markers of a man's ability to provide resources and paternal care to offspring. For a short term mate, however, genetic fitness should be more important, because it may increase the

chances of having offspring who have greater reproductive fitness to be able to reproduce themselves (see e.g., Greiling & Buss, 2000).

Numerous studies have found evidence that, during fertile versus infertile days of their cycle, women prefer men that are more socially dominant and have more masculine faces (Gangestad & Thornhill, 1998; Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004; Gangestad et al., 2007; Penton-Voak & Perrett, 2000; Penton-Voak et al., 1999). Although the results of most studies have supported these findings, two studies have not found significant effects. In one study, researchers found little association between menstrual cycle shift and preferences for masculinity and body shape in men (Peters, Simmons, & Rhodes, 2009). In this study, normally cycling women at high- and low- fertility days rated photographs of men for attractiveness. These ratings were then compared to independent ratings of the photographs by women who were either taking hormonal contraception or were not in particular days of their menstrual cycle. The researchers found that correlations between attractiveness and masculinity did not significantly differ between high- and low-fertility women. The authors suggested that the influence of cyclical shifts in the menstrual cycle may be too subtle to influence actual responses to men when selecting a potential short term mate. Importantly, however, only a very small subset of women provided ratings (N=25) in Peters et al. (2009). Moreover, the ratings were based on photographs rather than video clips, which is the preferred method, given that video clips can provide more behavioral data than photographs, and in general, more behavioral data yields greater accuracy (Carney et al., 2007). As such, more work may be needed to draw meaningful conclusions.

In addition to the Peters et al. (2009) study, Harris (2010) also failed to detect an association between attraction to masculine faces and fertility. The author compares her findings

to two other studies finding positive associations, stating that because her sample size was larger, more confidence should be placed in her results. However, in a rebuttal commentary, DeBruine et al. (2010) point out a number of flaws in Harris' study that cast significant doubt on the validity of her findings. For example, Harris (2010) failed to review studies which have found that menstrual cycle shifts are related to preferences other than masculine faces such as body shape and traits of dominance. She also argued her study has one of the largest sample sizes even though other studies finding positive associations have had similarly large sample sizes. The mean age of women in Harris' study was also significantly larger than the mean age of women in the majority of the studies finding positive associations, suggesting that age may play a role in whether menstrual cycle shifts influence preferences towards particular men. Finally, Harris (2010) not screen out women using forms of contraception aside from oral contraception (e.g., vaginal rings, hormonal IUDs), even though these forms of contraception alter the menstrual cycle and should therefore also be screened out. Thus, DeBruine et al. (2010) conclude that although the Peters et al. (2009) and Harris (2010) studies were both unsuccessful at replicating the general findings in this literature and should therefore not be discounted, this evidence should be interpreted in the context of the prevailing finding that women's preferences for masculine men do indeed change over the course of their menstrual cycle.

In light of this controversy, it is surprising that no study to date has examined effects of fertility on women's mate preferences following face-to-face meetings with men. Indeed, existing speed-dating studies which have assessed contraceptive use and menstrual cycle (e.g., Asendorpf, Penke, & Back, 2011) have yet to examine how stages of the menstrual cycle may affect dating preferences. There is thus a need to examine whether menstrual cycle shifts are associated with in-vivo preferences in mates. Moreover, speed-dating studies would also allow

researchers to examine how the stage of the menstrual cycle may influence how women are perceived by men, an area often overlooked in existing research.

The Current Study

Although speed-dating studies have become increasingly common during the past decade (see Finkel, Eastwick, & Matthews, 2007), there is still significant room for additional research. Existing research has typically found that physical appearance seems to matter for both men and women (with some mixed evidence that it matters more for men than women), positive qualities of humor and friendliness are considered more attractive, and for women, openness to experience, education, and income may play a role in making a potential mate more attractive (Asendorpf et al., 2011; Eastwick & Finkel, 2008; Fisman, Iyengar, Kamenica, & Simonson, 2006; Houser, Horan, & Furler, 2007). Although many of these studies examined a multitude of traits that may be involved in the mate selection process, there is a need for a study that examines a core set of theoretically-relevant attributes as they relate to in-vivo mate preferences. For example, to what degree does the WHR and SHR influence individual's attractiveness as potential mates? To what degree does a woman's stage in the menstrual cycle influence her attraction to a potential mate? Are there differences in the type of mate selected when considering a short term versus long term relationship? To date, there has been no study that has attempted to answer such questions. The current study aims to fill this gap.

Specifically, the current study examines whether many of the traits discussed above can be identified upon first meeting and are related to mate value using a sample of previously unacquainted, single individuals. This exposure to "thin slices" of potential mates' behaviors allows us to meaningfully study the extent to which evolutionary indicators of reproductive fitness, personality, and psychopathology are related to mate value. The current study also

examines stage of the menstrual cycle in women as well as a potential influence of attraction towards particular men. The current study asks individuals to make ratings of one another on a variety of variables (e.g., likelihood of considering the person as a friend vs. romantic partner) and then examine how these ratings are associated with indicators such as physical attractiveness, body shape, stage of menstrual cycle, personality, and psychopathology. Because the same sample and procedure was used for all analyses in the current study, Chapter 3 presents results of the general findings in the sample, Chapter 4 focuses on results of the psychological indicators of reproductive fitness (i.e., personality and psychopathology), and Chapter 5 focuses on results of the physical indicators of reproductive fitness (i.e., body shape). Importantly, Chapter 3 presents findings relevant to both Chapters 4 and 5.

CHAPTER TWO
METHOD

Participants

The currently study consists of a total sample of 423 undergraduate students (N = 207 male) who participated in exchange for course credit or extra credit in their psychology courses. The 423 previously unacquainted students comprised 50 total groups of 6 to 10 members each (i.e., each group consisted of 3-5 females and 3-5 males). Although participants were asked prior to beginning the study if they knew any member of the opposite sex within their group, two individuals within one group were dishonest about the extent to which they knew each other. In a manipulation check at the end of the experiment, they stated that they were good friends with one another. This group was therefore excluded from all further analyses. In addition, three male participants were dishonest about having already participated in the study during a subsequent semester and participated in another group. Given that identifiable information was not collected on each participant, these males were not identified until observers were asked to rate photographs for attractiveness and found that there were repeat participants. Thus, the three groups in which there were repeat participants were also excluded from all further analyses. The final sample thus consisted of 387 undergraduate students (N = 188 males) in 46 groups. Several additional participants also noted that they recognized individuals from classes in the manipulation check, but these groups were not excluded because the individuals denied that they actually knew each other. Participants were required to be heterosexual and single (i.e., not currently in a monogamous romantic relationship). However, a small percentage of participants were in fact in monogamous relationships (5%). Participants ranged in age from 18 to 20 years of age (M = 18.9, SD = .8) and were predominantly Caucasian (82%).

Procedure

As part of the informed consent process, participants were told that they would be individually interacting with several members of the opposite sex for a short period of time. After consenting through the online subject pool system, participants first signed up to attend the in-lab portion of the study, after which they completed several online questionnaires assessing psychopathology, personality, and women's menstrual cycle.

During the in-lab sessions, each group consisted of 3 to 5 members of each sex (i.e., 3-5 males and 3-5 females). Upon arrival, participants were asked if they recognized any member of the opposite sex either by name or face. Because many of the participants would have had classes with one another, they were asked the extent to which they know someone if they recognized him or her. If they stated they regularly spoke to the person inside or outside of class, one of the two that knew each other was asked to reschedule and participate in an alternate session.

Participants were seated in a small classroom arranged with five groups of desks spaced evenly around the edges of the room and several desks spaced apart from one another in the center the room. They were handed a packet of questionnaires and asked to wear differently-colored nametags with subject numbers on them. Members of one sex were then asked to each sit at one of the five groups of desks, and members of the opposite sex were asked to sit across from each person seated. All participants were then told that they would have five minutes to "get to know" the person with whom they are seated. After five minutes, they were asked to stop their interaction, and members of one sex were asked to move to the center of the room. All participants then completed a post-date "Dating Preferences" questionnaire on the person with whom they had just interacted. Upon completion of the survey, members seated in the middle of the room were asked to rotate to the next table, where they then interacted for five minutes with

the next individual. These procedures were repeated until all members of the opposite sex interacted with one another. As some research has suggested that the seated sex is the "choosier" of the two (Finkel & Eastwick, 2009), sessions were counterbalanced such that a different sex rotated during each session (i.e., males rotated during one session and females rotated the next session), and this hypothesis was examined in the final data analyses.

Following all of the interactions, participants were asked to spread out around the room to complete paper questionnaires in their packet (i.e., Adult Self-Report, Sociometric Scale) while they were taken individually to have their body measurements and photograph taken. They were also asked to provide a saliva sample for future molecular genetic analyses. After completion of all subject tasks, participants were thanked, debriefed, and permitted to leave.

Measures

A full list of measures that were collected in this sample can be found in Table A.1. Given that this data was collected to accommodate other research questions not germane to the current study, many measures will not be discussed. Measures that were the focus of the current study are discussed below.

Personality. Participants completed the 120-item International Personality Item Pool - NEO (IPIP-NEO; Johnson, 2000) to measure the same facets of the Big Five personality traits that are assessed by the NEO PI-R (Costa & McCrae, 1992). The IPIP-NEO is a measure of 30 lower order personality facets that coalesce into five higher order domains or factors: Extraversion (i.e., higher scorers are outgoing, energetic, and have a tendency to seek stimulation), Neuroticism (i.e., higher scorers have a tendency to experience unpleasant emotions easily, such as anger, anxiety, or depression), Conscientiousness (i.e., higher scorers tend to show greater self-discipline, organization, and act dutifully), Agreeableness (i.e., higher scorers

have a tendency to be compassionate and cooperative compared to low scorers), and Openness to Experience (i.e., higher scorers have a tendency to be curious, and have an appreciate for art and adventure when compared to low scorers). For the current study, all higher order factors as well as their lower order facets were examined. Descriptions and internal consistency reliabilities for all higher order factors and lower order facets are presented in Table B.1.

As seen there, internal consistency reliabilities of the five, higher-order scales ranged from .82-.87. For the lower-order facet scales, internal consistency reliabilities were greater than .65 for all but five scales (i.e., Dutifulness, Self-Discipline, Emotionality, Adventurousness, and Liberalism; the lowest internal consistency was .54). One individual was missing data for personality.

Psychopathology. All participants completed the Adult Self-Report (ASR; Achenbach & Rescorla, 2003), which is broad measure of psychological and behavioral problems for individuals aged 18-59 years. The questionnaire consisted of a series of statements for which participants were asked to rate the extent to which each statement described themselves during the last 6 months on a 3-point scale (0 = Not True; 1 = Somewhat or Sometimes True; 2 = Very True or Often True). The current study made use of the two broad scales of Internalizing and Externalizing psychopathology as well as the lower order syndrome scales which constituted these broader dimensions. The Withdrawn and Anxious/Depressed scales constituted the Internalizing composite scale, and Rule-Breaking and Aggressive Behavior constituted the Externalizing composite scale. Internal consistency reliabilities and descriptions of these scales are presented in Table B.1. There was no missing data for this measure.

In addition to the ASR, participants completed the 32-item Subtypes of Antisocial Behavior Questionnaire (STAB; Burt & Donnellan, 2009) in order to examine more specific

facets of antisocial behavior. The STAB consisted of three scales: physical aggression (e.g., getting into physical fights, hitting and threatening others), rule-breaking (e.g., shoplifting, stealing, and breaking and entering), and social aggression (e.g., making fun of someone behind his/her back, trying to hurt someone's feelings, making negative comments about others' appearance). Importantly, although both the ASR and STAB measure rule-breaking behaviors, the ASR rule-breaking scale included substance and drug abuse items as well peer deviance, whereas the STAB rule breaking scale measures specific status and property violations. Internal consistency reliabilities for the STAB subscales ranged from .81-.86, and less than 1% of the sample was missing data for these scales.

Body Measurements. Trained undergraduate research assistants were asked to take several body measurements from each participant. Each participant's height was taken using a height measuring tape against the wall and weight was measured via a standard weight scale. Second, each participant's shoulder, waist, and hip measurements (in centimeters) were taken using a tape measure. Importantly, research assistants were asked to practice and train taking the measurements on ten volunteer undergraduate research assistants in order to ensure their measurements were reliable prior to measuring participants in the current study. Based on a two-way mixed effects model of single measures and absolute agreement, the intra-class correlations for the four undergraduate raters across the ten undergraduate targets ranged from .90-.98 for the shoulder, waist, and hip measurements. There was no missing data for the body measurements.

Menstrual Cycle. A questionnaire was administered to each woman assessing various aspects of her menstrual cycle. In order to estimate the stage of their menstrual cycle, women were asked to estimate the start dates of their last two periods. They were also asked whether they had taken any hormonal contraceptives prior to the age of 18. If they answered yes, they

were asked to provide the age at which they began taking the contraception and how long they were taking hormonal contraceptives from the time that they started to the time of the study (i.e., continuously, stopped and started with more than one period of use, or stopped after a single period of use). If they stopped taking hormonal contraceptives, they were asked to state the age at which they stopped. These items were all answered prior to participation in the in-lab study, and thus, the reported dates were adjusted in relation to the time of their in-lab participation (i.e., in order to calculate stage of the menstrual cycle). The majority of students participated in an in-lab session within two days of completing the online questionnaires. For a small subset of the sample (N = 44 women), these questions were also asked during their in-lab assessment in order to ensure consistency across the two survey methods.

Although reliance on self-report is not ideal for assessing stage of the menstrual cycle given that some women may not accurately recall the dates of their periods and some may not ovulate at all during their cycle, previous research has predominantly relied on such methods given they are less resource intensive than collecting daily hormonal levels across an entire menstrual cycle. The current study made use of procedures outlined in Gangestad et al. (2007) to determine stage of the menstrual cycle. Specifically, women's conception risk was estimated using actuarial medical data reported by Wilcox, Duncan, Weinberg, Trussell, and Baird (2001).

This procedure first involved excluding all women who reported taking hormonal contraceptives and the one participant who did not answer the question (N = 91; 46% of women). Next, each remaining woman's average cycle length was assessed using her report of her last two periods. Cycle length based on the online survey was not significantly correlated with cycle length calculated based on the same survey answered in-person for the sample of 44 women (r = .28, *ns*). However, of the 44 women, only 17 women were included in this correlation because of

the exclusionary criteria. Therefore, for the purposes of the current study, the average cycle length was determined using women's online reporting of their last two periods. Of the 108 women who were not on hormonal contraceptives, 29 women's cycle lengths could not be calculated due to missing data (i.e., the woman did not report the period before her last) or the reported data seemed invalid (e.g., a cycle length of greater than 60 days, a cycle length of only one day, reporting the last period as an earlier date than the period before the last). This process yielded an average calculated cycle length of 32.2 days (SD = 8.5) for the 79 women who were not on hormonal contraceptives.

Using the actuarial table reported by Wilcox et al. (2001) each woman's conception risk was determined based on her report of her last period and the date of her participation in the in-lab portion of the study.[1] For example, for a woman who reported the first day of her last period was 10 days prior to her participation, she would have a .061 chance of conception (i.e., 6.1%), based on the Wilcox et al. (2001) actuarial table. The correlation between the online and in-lab reports for the first day of the last period for the subset of women (N = 23) who reported both methods was $r = .94$ $p < .05$. Therefore, only the online report was used to calculate conception risk given that all women in the sample had to complete the online survey. There were 79 total women for whom conception risk was calculated after excluding those on hormonal contraceptives and those with missing data.

Photographs. A digital photograph of each participant was taken from the waist up. Research assistants taking the photos were told to continue taking photographs of participants until the participants were satisfied with the image. After all data collection was completed, ten undergraduate research assistants (50% male) were selected to rate each photograph on eight dimensions. Observers were asked to answer the following questions using a 7-point Likert scale

ranging from “Definitely No” to “Definitely Yes:” “Is this person dressed sexually provocatively,” “Is this person revealing a lot of skin on their body (aside from their face),” Is this person well-groomed,” “Is this person dominant,” “Is this person warm,” “Participants will want to be friends with this person,” and “Participants will want to date this person.” In addition, they were asked to answer “Compared to the average person, how physically attractive is this person?” on a 7-point Likert scale ranging from “Not at all attractive” to “Very attractive.” Results from these ratings were used as observer-level ratings of attractiveness. Raters were asked to skip people whom they recognize or know in order to ensure that the observer-ratings were a zero-acquaintance measure of attractiveness that would not be biased by familiarity. One person’s photograph was missing in the current sample.

Intra-class correlations (ICCs) for all of the above ratings were calculated across the ten raters based on a two-way mixed effects model using average raters and absolute agreement. A two-way mixed effects model was used because each participant was assessed by each rater and the raters were the only raters of interest. The ICC was calculated using average raters and absolute agreement given that an average across all raters would ultimately be used in further analyses, and raters must agree on the magnitude of their ratings, not just the relative place of each target on the rating scale. There were a high number of raters who recognized the participants, and thus, in order to calculate ICCs using the most complete data, an average was first computed for each participant and each variable across all raters. For any participant who was missing data from one rater (N=97), that participant’s average was imputed into the missing data only for the purpose of calculating the ICC. For any participant missing data from more than one rater (N=43), their ratings were not included in the ICC calculations. Using this method, ICCs for all variables ranged from 0.72-0.89 with the exception of the “Dressed Sexually

Provocatively" item (ICC = .64). For the purposes of data analyses, the average for each participant prior to imputing any missing data was used.

Dating Preferences. Participants were asked to complete the Dating Preferences questionnaire following each brief interaction with members of the opposite sex. This post-date questionnaire consists of 16 items. The first six items used the prompt, "Would you consider ... with the other person?" The items included in the blank were friendship, kissing, hooking-up, having a one-night stand, dating the person short term (i.e., less than one month), and dating the person long term (i.e., more than one month). The next two items asked, "Are you physically [emotionally] attracted to this person?" The next six items assessed meta-perceptions (i.e., how the individual thinks he or she is perceived by the other person) using the prompt, "Do you think this person would like to … with you?" The items included in the blank were the same as the first six items (i.e., be friends, kiss, hook-up, have a one-night stand, date short term, date long term). The next question asked, "Do you think this person is physically attracted to you?" All of the above items are asked on a 7-point Likert scale ranging from "Definitely No" to "Definitely Yes." A final question asked, "Compared to the average person, how physically attractive do you think this person is?" This item was asked on a 7-point Likert scale ranging from "Not at all attractive" to "Very attractive," and it was meant to be an absolute measure of attractiveness that could be directly compared to the observer ratings of attractiveness from the photographs.

Two additional items were added mid-way through data collection: "Would you consider being in a more serious long term relationship with this person?" and "Do you think this person wants to be in a more serious long term relationship with you?" These items were added for a sub-sample of 94 participants to assess whether there were meaningful differences between

defining a long term relationship as lasting greater than a month versus defining a long term relationship as more serious.

Sociometric Scale. Participants completed the Sociometric Scale following all of their speed-dates. This form first asked three open-ended questions asking participants to select the person with whom they would most consider having a … with and why. The blank was completed with "one-night stand," "short term relationship," and "long term relationship." Participants were told they could skip the "one-night stand" item if they would not consider having a one-night stand with anyone with whom they interacted. The form then asked a manipulation check item, "Did you know or had you met any individuals before participating in this study? If so, please name them and say how well you know them." As stated earlier, based on answers from this item, one group was dropped from the study given that two participants within the group indicated they were good friends.

Four items then asked participants to rank everyone with whom they interacted in order from most… to least… The blanks included physical attractiveness, likelihood of having a one-night stand, likelihood of having a short term relationship, and likelihood of having a long term relationship. Participants were told if there was no one with whom they would like to have a one-night stand with, they could skip the item.

The current study made use of the last four absolute-rank items. The "one-night stand" rank item was excluded from data analyses given that 36.7% of the sample did not answer this item, and there were no groups with complete data on the item. Two individuals did not complete the "attractiveness" rank, six individuals did not complete the "most likely to have a short term relationship" rank, and ten individuals did not complete the "most likely to have a long term relationship" rank. Rank variables for which there was missing data within a group were

excluded from final analyses, because the Social Relations Model (see below; Kenny, Kashy, & Cook, 2006) does not allow for missing data.

Data Analyses

The Social Relations Model (SRM; Kenny et al., 2006) was used to analyze all dyadic data. The SRM is a model that allows researchers to calculate variance due to individual-level and dyad-level components based on rating data from two-person interactions. The model decomposes each interaction into three effects: the actor, partner, and relationship effect. The actor effect represents a person's average level of a given behavior in the presence of a variety of partners. The partner effect captures the average level of a response which a person *elicits* from a variety of partners. Finally, the relationship effect represents a person's behavior toward another specific individual, above and beyond the actor and partner effects. As an example, suppose that Sally and Mike have a speed-date with one another and then rate how attracted they are to the other person. Sally's attraction to Mike may be the result of three different sources of variance. First, Sally may be attracted to Mike because she has a high actor effect and tends to rate all partners as attractive. Or, it may be the case of a significant partner effect, which would suggest that all females tend to rate Mike as attractive. Finally, her attraction to Mike may be driven by their unique relationship effect, which is the extent to which she rates Mike as attractive controlling for her general tendency to rate others as attractive and Mike's tendency to be rated as attractive. The relationship effect also contains measurement error when there are not multiple assessments (e.g., time points) of dyadic data.

Actor and partner effects are individual-level variables, and the relationship effect is a dyad-level variable. Using the program BLOCKO (Kenny, 1998), individual estimates of the actor and partner effects can be computed for use in additional analyses. However, in order to

use these actor and partner effects, there must be significant variance explained by them. Variance partitioning in the SRM was computed based the 16 Dating Preferences items and the three absolute-rank items from the Sociometric Scale. Because separate analyses must be conducted for each group size, the SAS statistical program was used to pool variances from all groups and examine whether overall proportions of variance explained by actor, partner, and relationship effects are statistically significant.

Because the current study aimed to identify whether certain traits were associated with a person being perceived as more desirable as a potential mate, the current study focuses primarily on partner effects of the items assessing dating preferences. Specifically, *partner effects* for the various items in the Dating Preferences essentially represented the degree to which individuals are perceived as attractive or "dateable" (e.g., dateable for the short term, dateable for the long term) by their rating partners. Absolute-rank items from the Sociometric Scale were examined to illustrate the degree to which a person is perceived as attractive or "dateable" for the different rank items. For the items assessing meta-perceptions in the Dating Preferences questionnaire, actor effects were examined instead of partner effects. *Actor effects* for meta-perception items represented the degree to which individuals perceive themselves to be perceived as attractive or "dateable" by their rating partners.

Once partner effects for the dating preference items and actor effects for the meta-perception items were estimated for each individual and were determined to be statistically significant, they were then correlated with the various individual-level variables such as personality, psychopathology, and the physical indicators including body measurements. These correlations would identify traits that were considered desirable in a potential mate; that is, traits that increase an individual's mate value. Stage of the menstrual cycle was also compared to

ratings of attractiveness in order to examine whether females find men more attractive during certain stages of their cycle. Moreover, partner effects for the items assessing dating preferences were also compared to the observer ratings of photographs in order to determine the role of physical attractiveness (as measured by observers) in perceptions of mate value. Overall, these correlations allowed exploration of the traits and factors involved in increasing one's mate value.

CHAPTER THREE
GENERAL FINDINGS

Dating Preferences Questionnaire

Eight participants were missing data for one item each on the questionnaire. Given that the SRM analyses do not allow for missing data, the average of that item was imputed for these participants. Importantly, this average was based on the average of the other raters' ratings of the target for whom the participant with the missing data was missing a rating.

Means, standard deviations, and gender difference effect sizes are presented in Table B.2. As seen there, men rated the majority of items significantly higher than women. The exceptions were the two items assessing friendship and the meta-perception for friendship, for which women rated the item slightly higher than men. Gender differences were significant for all items except for the meta-perception of friendship.

Items were all normally distributed with the exception of "Would you consider being friends with this person," which was significantly negatively skewed (skewness = -1.1, SE = .06). To account for this item's non-normality, the item was reverse coded (to become positively skewed), log-transformed, and then multiplied by -1 in order to place the item back on the original scale such that higher numbers reflect a greater consideration of wanting to be friends with the person.

There was significant inter-item correlations across the various items in the Dating Preferences Questionnaire (i.e., r's from .08 to .90, all p's < .05). Accordingly, a factor analysis using Principal Axis Factoring with a Promax rotation was done on the 18 total items. Results revealed three underlying factors explaining 72.9% of the variance. The first factor included items asking "Would you consider … with the person" for kissing, hooking-up, having a one-night stand, having a short term relationship, having a long term relationship, and having a very

serious long term relationship, “Are you physically (and emotionally) attracted to this person?” and “Compared to the average person, how physically attractive do you think this person is?” This factor was labeled “Dateability,” and it explained 46.5% of the total variance. The second factor included all meta-perception items (except for the friendship item): “Do you think this person would want to…with you?” for kissing, hooking up, having a one-night stand, having a short term relationship, having a long term relationship, and having a very serous long term relationship and “Do you think this person is physically attracted to you?” This factor was labeled “Meta-Dateability,” and it explained 20.4% of the variance. For the purposes of the SRM, items within these factors were therefore averaged for a final “Dateability” and “Meta-Dateability value for each person (who would have an average from each rater).

The last factor explained 6% of the variance and included both the friendship (transformed) and meta-friendship items (i.e., “Would you consider friendship with this person” and “Would this person consider friendship with you”). This factor remained unlabeled, given the items of “Friendship,” and “Meta-Friendship” measure perceptions and meta-perceptions. Given that the focus of the current study was on preferences in a potential mate and not a potential friend, these items will not be discussed in the remainder of the paper. However, these items were analyzed in the SRM, and a summary of the results of this item are provided in Appendix C (Tables C.1-C.4).

Do individuals in monogamous relations make systematically different ratings of others than individuals who are single? Given that 5% of the sample (N = 19 participants) was dishonest about their relationship status and were in fact in monogamous, dating relationships (i.e., either dating someone exclusively or living with their romantic partner), Dateability and Meta-Dateability ratings made by this group of participants was compared to ratings made by the

single participants. Results revealed that single participants made significantly higher ratings for Dateability than participants who were in relationships ($t(1627) = 2.7$, $p < .05$; Cohen's $d = .30$) but not for Meta-Dateability ($t(1627) = 1.7$, *ns*; Cohen's $d = .20$). These results suggest that individuals in monogamous relationships were more conservative in their ratings of others than individuals who were not in monogamous relationships.

Is the rotating sex, the "choosier sex"? Existing research has supported that men tend to be less selective than women when evaluating a potential mate, perhaps because it is less costly for them to overestimate a woman's interest than underestimate her interest (Haselton & Buss, 2000). Recent research, however, has argued that this sex difference does not emerge in speed-dating research. Specifically, Finkel and Eastwick (2009) found that the sex that is seated during speed dates is often "choosier," such that they are more selective in their mate choices. To assess whether this finding replicated in the current data, speed date sessions were counterbalanced such that a different sex rotated during each session (i.e., males rotated during one session and females rotated the next session). Results suggest that males rated Dateability and Meta-Dateability higher both in sessions when females were seated and males were rotating ($t(855.4) = 8.7$, $p < .05$ and $t(812.1) = 4.2$, $p < .05$ for Dateability and Meta-Dateability, respectively; Cohen's $d = .59$ and .29, respectively) and in sessions where males were seated and females were rotating ($t(743.3) = 7.7$, $p < .05$ and $t(764) = 5.7$, $p < .05$ for Dateability and Meta-Dateability, respectively; Cohen's $d = .57$ and .41, respectively). Results suggest that overall, men rate being more interested in women for dating than women rate being interested in men for dating. In addition, men also perceive women to be more interested in them for dating than vice versa, no matter who is rotating during speed-dates. Thus, the current results fail to support the

findings that social norms surrounding romantic initiation are generally arbitrary and women are not always the "choosier" sex.

Do participants' ratings change across speed-dates? Given that each participant engaged in multiple speed dates, it was possible that their ratings systematically changed from their first speed date to their last. For example, after completing the Dating Preferences Questionnaire in the first speed date, a participant may have become more familiar with the items in subsequent speed dates and therefore rate subsequent dates differently. This possibility was examined in the current data. Given that there was only a record of the first person with whom participants interacted in their group, ratings from this first speed date were compared to ratings made from all subsequent speed dates. Results revealed that there were no significant changes between the first speed date and all others in ratings for Dateability ($t(555.1) = 1.5$, *ns*) and Meta-Dateability ($t(1628) = .09$, *ns*). These results suggest that participants' overall ratings of Dateability and Meta-Dateability were not affected from their first speed date to the final date.

Sociometric Scale Rank Items

Participants' rank order lists of individuals for the Attractiveness, Short Term relationship, and Long Term relationship items were recoded and given numbers denoting the rank order. A "1" indicated the participant found that target to be the most attractive, and the participant was most likely to consider that target for a short term and long term relationship. As stated earlier, the "One-night Stand" rank item was excluded from the SRM model given the high degree of missing data (i.e., because individuals were given the option to opt out of answering if they did not consider having a one-night stand with anyone in the group). Accordingly, lower numbers indicated that the individual was perceived to be more attractive.

Partner effects from the Social Relations Model for the rank items were thus multiplied by -1 prior to subsequent analyses, so that a higher score indicated higher levels of attractiveness.

Social Relations Model (SRM)

The SRM (Kenny et al., 2006) for a half-block design was used to partition variance in individuals' social interaction ratings. Estimates of the SRM parameters (i.e., actor, partner, and relationship variance; actor and partner effects) were obtained from the program BLOCKO (Kenny, 1998). Five variables were estimated in the SRM: Dateability, Meta-Dateability, Attractiveness Rank, Short Term Relationship Rank, and Long Term Relationship Rank. SRM variance portioning for these variables are presented in Table B.3. As seen there, this table includes the total amount of variance for each variable as well as the relative percentage of variance in the variable accounted for by the actor, partner, and relationship (plus error) effects. Estimates of these values are provided for men and women separately. Significant actor and partner variances are denoted in the table. Relationship variance cannot be tested for statistical significance given that it encompasses error in its estimate.

There was significant partner variance observed for Dateability, suggesting that men and women tend to agree on the extent to which a given member of the opposite sex is dateable, or has a high mate value. The actor variances for the meta-perception items capture the degree to which a participant believes that his or her rating partners perceive him or her as dateable (i.e., Meta-Dateability). As seen in Table B.3, the actor variance for Meta-Dateability was substantial and significant, suggesting that men and women perceive themselves as generally perceived as datable (or not). The presence of significant variability for both Dateability partner effects and Meta-dateability actor effects indicates that it is possible to examine whether one's mate value

(and one's perceptions of his or her own mate value) was associated with one's personality, psychopathology, physical attractiveness, etc. These results are presented in Chapters 4 and 5.

For the three Sociometric Scale rank items, actor variances were set to zero, as there can be no actor variance in participants' rank-ordering of other individuals. Partner effects for these items, however, were significant and substantial for both men rating women and women rating men, suggesting that men agree in their ratings of women in absolute rank terms and women agree in their ratings of men in absolute rank terms. The Sociometric Scale rank items were also correlated significantly with Dateability for both men (i.e., *r*s of .88, .79, and .82, all *p*s < .01, for correlations of Dateability with the Attractiveness Rank, Short-Term Rank, and Long-Term Rank) and women (i.e., *r*s of .91, .86, .88, all *p*s < .01, for correlations of Dateability with the Attractiveness Rank, Short-Term Rank, and Long-Term Rank). This finding suggests that, not surprisingly, individuals' ratings and rankings of others were highly similar.

The SRM also provides Generalized Reciprocity correlations, which is the association between individuals' actor effects and their partner effects. Because the current study assessed meta-perceptions, a positive and significant association between men's actor effects for Meta-Dateability and their partner effects for Dateability would indicate the extent to which men are accurately perceiving their own mate value. For men, the Generalized Reciprocity correlation for Dateability was non-significant ($r = .05$, *ns*), suggesting that men who believed that others thought they were more dateable were not in fact rated as more dateable by their female dates. Women, on the other hand, had a significant and moderate Generalized Reciprocity correlation for Dateability ($r = .37$, $p < .05$), and this correlation was significantly higher than that for men. This result suggests that women who believed that men were rating them as more dateable were indeed considered more dateable by their male dating partners.

Observer Ratings of Photographs

Zero-order correlations between the eight items on the Observer Ratings of Photographs are presented in Table B.4. Correlations for men are presented below the diagonal, and correlations for women are presented above the diagonal. Some trends are worth noting. First, "Dressed Sexually Provocatively" and "Revealing Skin" were highly correlated for both men and women (*r*s = .77 and .91, respectively, both *p*s < .01), suggesting that they were measuring similar attributes. Similarly, "Others Would Want To Date" and "Overall Attractiveness" were also highly correlated for both men and women (*r*s = .93 and .97, respectively, both *p*s < .01), suggesting that observers rating targets as attractive were also more likely to believe the targets would be considered for dating. For men and women, "Dominant" and "Warm" were negatively correlated with one another (*r*s = -.44 and -.49, respectively, both *p*s < .01), suggesting that these two items were tapping opposite attributes. Interestingly, for men, "Dominant" was positively correlated with other attributes that were associated with greater attractiveness as a potential mate (i.e., "Others Would Want to Date" and "Overall Attractiveness") whereas "Dominant" for women was either negatively associated or not significantly associated with those same attributes. This finding suggests that based on zero-acquaintance, observers perceiving dominance in photographs of men also believed the men were more appealing as potential mates, whereas if dominance was perceived in women, observers tended to believe it would make women less appealing as potential mates.

Are observer ratings of photographs associated with dating preference variables? The eight items on the Observer Ratings of Photographs were correlated with the five dating preference variables from the SRM. These correlations reflect the degree to which observer ratings of photographs, based on zero-acquaintance, were associated ratings made by individuals

who interacted with the targets for five minutes. These correlations are presented in Table B.5. For men and women, observer ratings of photographs for the items of "Others Would Want to Date" and "Overall Attractiveness" were significantly correlated in consistent directions with all dating preference variables based on partner effects (i.e., all dating preference variables except for the meta-perception effects). The direction of the correlations suggests that independent observer ratings of photos of targets agree with participants interacting with targets on dimensions of attractiveness and perceived mate quality. These correlations were uniformly significant and range from moderate to large in magnitude (.35- .65). "Well-groomed" showed similarly sized associations in both sexes. The observer photograph ratings for dating/attractiveness also agreed with targets' perceptions of how dateable they were being rated as potential mates (i.e., Meta-Dateability), but only in women.

For men, observer photograph ratings of "Dominant" were positively correlated with all dating preference variables, suggesting that men perceived to be more dominant in photographs were also rated by their female speed dating partners as being more attractive as a potential mate. Observer photograph ratings of "Warm" were not associated with dateability for men. By contrast, for women, observer photograph ratings of "Warm" and "Others Would Want to be Friends" were moderately correlated with all other-rated dating preference variables. Women perceived as more dominant in their photographs were viewed as less attractive and less dateable (rs = -.18 and -.17 for correlations with "Dateability" and "Attractiveness Rank," respectively, both ps < .05) during speed dating sessions. Observer photograph ratings of provocative clothing and revealing skin, however, were either not associated with or were negatively associated with the dating preferences partner effect variables.

Are observer ratings of targets' photographs associated with targets' self-ratings of personality? The photograph items of "Dominant," "Warm," and "Overall Attractiveness" were also examined in relation to individuals' self-reports of personality traits. As seen in Table B.6, the observer photo ratings of "Dominant" were positively associated with target personality self-reports of Assertiveness in men ($r = .30$, $p < .01$) but not in women ($r = .09$, *ns*), which was a significant difference using Fisher's r-to-z transformations ($Z = 2.13$, $p < .05$). On the other hand, the observer photo ratings of "Warm" were associated with target personality self-reports of Friendliness, Gregariousness, and Cheerfulness scales in women (rs = .19, .16, and .18, respectively, all ps < .05) but none of these subfacets of Extraversion were associated with observer photograph ratings of "Warm" in men. Photo ratings of "Warm" were not associated with personality self-reports of Agreeableness in women ($r = .11$, *ns*), but were associated with personality self-reports of Agreeableness in men ($r = .15$, $p < .05$). Importantly, however, none of the correlations with the above self-reported personality facets of Extraversion and Agreeableness were significantly different from one another. These results suggest that observer ratings of targets' photographs are related to targets' self-ratings of personality to a small to moderate degree. However, there may be a higher degree of accuracy for detecting dominance in men through photographs alone.

Influences of the Menstrual Cycle

In order to examine whether the dating preference variables and Observer Ratings of Photographs are affected by shifts in the menstrual cycle, it was first necessary to examine whether women's ratings varied with their conception risk. As such, the *actor* effect for Dateability was correlated with conception risk, because the actor effect reflects the tendency for each woman to rate all of her male partners as dateable. Women's conception risk was not

significantly associated with the actor effect for Dateability, suggesting that women that were more fertile (i.e., had a higher conception risk) did not have a tendency to rate men as more or less dateable.

In addition, there were no significant associations between Meta-Dateability and conception risk. This finding suggests that women who were in more fertile stages of their menstrual cycle were not more or less likely to perceive themselves as being rated by their male partners dateable. Finally, there were no significant associations between any of the *partner* effects for the dating variables (i.e., Dateability, Attractiveness Rank, Short term Rank, and Long term Rank) and conception risk. This finding suggests that more fertile women were not rated as more attractive or dateable by men. Overall, the current study did not find significant effects of shifts in the menstrual cycle on dating preferences. Accordingly, shifts in the menstrual cycle were not examined as a potential moderator in the relationship between any individual-level indicator of reproductive fitness and variables of dating preferences.

Because a significant number of female participants were taking hormonal contraceptives, the current study also examined whether women taking hormonal contraceptives differed from women not taking hormonal contraceptives in their respective dating preferences. Women taking hormonal contraceptives were indeed significantly more likely to perceive that their male partners viewed them as dateable (i.e., Meta-Dateability) than women not taking hormonal contraceptives (i.e., $t(196) = 3.1$, $p < .05$; Cohen's $d = .45$). Women taking hormonal contraceptives were also generally perceived as more dateable by their male partners than were women not taking hormonal contraceptives, although this difference was only approaching significance (i.e., $t(196) = 1.9$, $p = .06$; Cohen's $d = .27$). For the dating preference rank items, women taking hormonal contraceptives were not rated as significantly more attractive (i.e.,

$t(190) = -1.4$, $p = .15$; Cohen's $d = .21$), but there were somewhat more likely to be considered for long term dating (i.e., $t(162) = -1.9$, $p = .056$; Cohen's $d = .30$) and short term dating (i.e., $t(175) = -2.4$, $p < .05$; Cohen's $d = .36$) as compared to women not taking hormonal contraceptives. Women taking hormonal contraceptives were also viewed as significantly more attractive, as assessed via observer ratings of photographs, than were women not taking hormonal contraceptives (i.e., $t(195) = 2.6$, $p < .05$; Cohen's $d = .37$). Results suggest that women taking hormonal contraceptives may be perceived as more attractive and dateable for certain types of relationships than women not taking hormonal contraceptives.

CHAPTER FOUR
PSYCHOLOGICAL INDICATORS OF REPRODUCTIVE FITNESS

In this section, personality and psychopathology are examined in relation to the dating preference variables. Specifically, each participant's partner effects for the dating preference and Sociometric variables and actor effects for the meta-perception dating preference variables were correlated with his or her individual-level variables. These correlations identify which traits are associated with perceptions of enhanced mate value.

Personality

Tables B.7 and B.8 present correlations between all personality lower-order and higher-order scales and dating variables for men and women, respectively. Given the large number of correlations conducted between all personality traits (both higher-order and facet-level traits) and dating preferences variables, procedures outlined in Sherman and Funder (2009) were used to evaluate the number of significant findings expected by chance. In this procedure, participants' scores on personality were randomly re-assigned (without replacement) to the original set of scores for the dating preference variables, creating a new pseudo-sample. Correlations were then conducted between the re-assigned personality and original dating preference variables, and the number of significant relationships were recorded (i.e., $p < .05$). These steps were repeated 1000 times, resulting in an approximate chance sampling distribution of significant results. If the number of significant results from the actual data is greater than the number of significant results determined from the mean of the randomization process, then it can be assumed that the results are beyond what would be expected by chance. This procedure yielded a mean of 1.8 (SD = 1.9) for men and 1.8 (SD = 1.9) for women for the number of significant correlations expected by chance. As seen in Tables B.7 and B.8, the number of

observed significant relationships in the current data well exceeded these averages, suggesting that these results are beyond what would be expected by chance.

There are several trends worth noting for men (Table B.7). First, men who perceived themselves to be rated as more dateable by their female partners self-reported lower levels of Agreeableness (r = -.19, p < .01), suggesting that men self-reporting lower Agreeableness perceived themselves to have greater mate value. Next, higher levels of self-reported Extraversion were associated with being perceived as more dateable (r = .20, p < .01), attractive (r = .15, p < .05), and being considered for both a short term and long term relationship (rs = .15 and .16, respectively, both ps < .05). This effect seems to be primarily driven by the Assertiveness subscale of Extraversion. In addition, greater Anger was also associated with being perceived as less dateable (r = -.14, p < .05). Thus, in general, it seems that men who were more appealing as potential mates were more assertive and were less likely to become easily angered.

Several trends are also worth noting for associations between women's self-reported personality traits and the dating variables (see Table B.8). First, women who perceived themselves to be rated as more dateable by their male partners were more likely to self-report higher rates of Self-Efficacy (r = .15, p < .05) and Openness (r = .17, p < .01), and lower rates of Cautiousness (r = -.16, p < .05). In addition, women rated as being more dateable self-reported lower rates of Dutifulness (r = -.18, p < .01) and higher rates of Friendliness (r = .14, p < .05), but these relationships did not persist to other dating variables such as attractiveness and consideration as a short term or long term mate. In contrast, greater self-reported Excitement-Seeking was associated with greater Dateability (r = .19, p < .01) and attractiveness (r = .16, p < .05). Thus, it seems that for women, being less dutiful, friendlier, and more excited are all associated with greater ratings for dateability.

Given that Overall Attractiveness, as measured by observer ratings of photographs, is strongly related to partner effects of Dateability in both men and women (*r*s = .47 and .63, respectively, both *p*s < .01) and it is also related to self-reported Extraversion in men (*r* = .30, *p* < .01), the significant relationships found between certain personality traits and Dateability were also examined after controlling for Overall Attractiveness as assessed by observer ratings of photographs. For men, self-reported Assertiveness remained significantly associated with partner effects of Dateability after controlling for observer photograph ratings of attractiveness (*r*s = .15, *p* < .05) but self-reported Anger was no longer significantly associated with partner effects of Dateability (*r* = -.14, *ns*). For women, self-reporting less Dutifulness remained significantly related to greater partner effects of Dateability after controlling for observer photograph ratings of Overall Attractiveness (*r* = -.21, *p* < .01), but the self-reported personality facets of Extraversion were no longer significantly related to greater partner effects of Dateability. Thus, it seems that general attractiveness, as assessed by observers, is driving the relationship between personality traits of Extraversion and ratings of Dateability in females. However, being less dutiful seems to remain associated with increasing one's perceived Dateability and observer rated attractiveness as a potential mate and is not simply driven by physical attractiveness per se.

Psychopathology

Dating preference variables were then correlated with the Subtypes of Antisocial Behavior (STAB) questionnaire and the Achenbach Adult Self-Report (ASR). Results are presented in Table B.9. As seen there, men who perceived themselves to be rated as more dateable by their female partners self-reported higher levels of Social Aggression (*r* = .23, *p* < .01), Externalizing psychopathology (*r* = .23, *p* < .01) and Rule Breaking on the ASR (*r* = .18, *p* < .05). None of these scales, however, seemed to play in role in actual ratings of men being

viewed as dateable by women. Instead, men self-reporting higher levels of Internalizing psychopathology (and more specifically, the Anxious-Depressed subscale of Internalizing on the ASR) were less likely to be rated as dateable (r = -.19, p < .01), and were less likely to be considered for a short term and long term relationship (rs = -.24 and -.25, respectively, both ps < .01). These results suggest that men who had tendencies to break rules and go against social norms were more likely to perceive that they would be considered as an attractive mate, but these traits did not seem to matter in making men more attractive to other women. Instead, women were generally more attracted to men reporting lower levels of anxiety and depressive symptoms.

Women, on the other hand, who self-reported higher levels of Externalizing psychopathology on the ASR were more likely to perceive that they would be rated as more dateable (r = .17, p < .05), and they were more likely to be rated by men as dateable (r =.15, p < .05). In addition, women who self-reported higher levels of Rule Breaking behavior on the ASR were perceived as more dateable (r = .17, p < .01) and attractive (r = .15, p < .05). They were also more likely to perceive that they would be rated as more dateable (r = .16, p < .05). Given that Extraversion was the personality trait with the largest association with Dateability in women and it is often correlated with Externalizing behaviors (i.e., in the current sample, Extraversion and Externalizing psychopathology was correlated .26, p < .01, for women), Dateability and Externalizing psychopathology on the ASR was correlated after controlling for trait levels of Extraversion. After this control, it seems that there is no longer a significant association between women's Dateability and their self-reports of Externalizing psychopathology (r = .12, p = .09), suggesting that this relationship is primarily driven by trait levels of Extraversion. For the Rule Breaking facet of Externalizing on the ASR, after controlling for Extraversion, greater levels of self-reported Rule Breaking in women remained associated with them being rated as more

dateable by men ($r = .14$, $p < .05$), suggesting that there was something about this subscale which men seemed to find more attractive. Given that the Rule Breaking scale for the STAB was not significantly related to Dateability in women, it may have been that the alcohol component of the Rule Breaking scale in the ASR was driving the relationship with Dateability. Indeed, after controlling for the item "I drink too much alcohol or get drunk" on the ASR, there was no longer a significant relationship between the Rule Breaking scale and Dateability in women ($r = .03$, *ns*). The above item, in contrast, was significantly correlated with Dateability in women ($r = .21$, $p < .01$), suggesting that women who were perceived to be more dateable also self-reported higher levels of drinking alcohol and getting drunk.

As with personality traits, significant findings between Dateability and psychopathology were also examined after controlling for Overall Attractiveness from the Observer Ratings of Photographs. For men, lower rates of Internalizing psychopathology on the ASR were still associated with higher Dateability, even after controlling for observer photograph ratings of attractiveness ($r = -.19$, $p < .01$). For women, greater self-reported Rule Breaking also remained significantly associated with higher Dateability after controlling for observer photograph ratings of attractiveness ratings ($r = .16$, $p < .01$). However, the alcohol item on the ASR was no longer related to Dateability after controlling for observer photograph ratings of attractiveness ($r = .08$, *ns*), suggesting that it is not drinking more alcohol alone that was associated with a woman being rated as more dateable, but it was that the woman was perceived as more attractive for drinking higher levels of alcohol which in effect made her rated as more dateable by her male partners. Indeed, there may be something about women who drink more alcohol that observers pick up on as attractive. Thus, certain forms of psychopathology do appear to be associated with mate value, above and beyond general physical attractiveness per se.

CHAPTER FIVE
PHYSICAL INDICATORS OF REPRODUCTIVE FITNESS

Body measurements, as described in the methods section, were also correlated with the five dating variables for men and women. These correlations identified whether body measurements that have been theorized to be related to greater mate value were actually related to increased attractiveness as a potential mate. As stated earlier, the Waist-to-Hip Ratio (WHR) is thought to be an indicator of fertility for women, and a WHR around .7 should therefore serve to enhance a woman's perceived attractiveness as a potential mate. For men, the Shoulder-to-Hip Ratio (SHR) is thought to be an indicator of dominance and strength, and a SHR that suggests a "v-shaped" torso should then enhance a man's attractiveness as a potential mate.

Prior to analyses, physical indicators were first correlated with observer ratings of photographs. As seen in Table B.10, men who were rated as more attractive in observer ratings of photographs were of lower weight (r = -.22, p < .05) and had more of the "v-shaped" torso (i.e., greater SHR, r = .24, p < .05), suggesting that observers were able to identify a potential marker of reproductive fitness through a photograph alone. Moreover, men who were rated in their photographs as more dominant were of greater height, weight, and were more likely to have a "v-shaped" torso (rs = .16, .23, and .20, respectively, all ps < .05), suggesting that evolutionary cues of physical strength were again observed through photographs alone. For women, lower body weight and a smaller WHR were significantly associated with attractiveness, as assessed via observer ratings of photographs (rs = -.47 and -.20, respectively, all ps < .05), suggesting that observers were again able to identify evolutionary indicators of reproductive fitness through photographs at zero-acquaintance. Women rated as more dominant were of greater body weight and had a larger WHR (rs = .28 and .19, respectively, all ps < .05). These results suggest that

physical indicators of reproductive fitness can be identified as attractive at zero-acquaintance through photographs.

Height, weight, the WHR, the SHR, and Body Mass Index (BMI) were then correlated with the dating preference variables for men and women separately. Results of these correlations are presented in Table B.11. As seen there, there were no significant associations between any of the body measurements and any of the dating preference variables in men. The only exception is the SHR, which was significantly associated with the Attractiveness Rank, such that a higher SHR (and a more "v-shaped" torso") was associated with being rated as more attractive by women ($r = .18$, $p < .05$), a finding that was consistent with the photograph attractiveness ratings made by observers. Importantly, however, after controlling for Overall Attractiveness from the Observer Ratings of Photographs, this relationship was no longer significant ($r = .06$, *ns*). This finding suggests that a "v-shaped" torso may only serve to enhance a man's physical attractiveness but not his attractiveness as a potential mate. Moreover, even after controlling for weight, there were no significant relationships between the SHR and the dating variables. Accordingly, it seems that body shape and size are of little importance to heterosexual women who are selecting potential mates from a pool of males even though they seem to matter in first impression judgments of photographs.

For women, lower body weight was associated with increased dateability ($r = -.47$, $p < .01$). This relationship was consistent across the three rank items, and women who were of lower body weight also were more likely to believe that they were being rated as dateable by their male partners ($r = -.26$, $p < .01$). Interestingly, the WHR and BMI had similar associations to the dating variables, but after controlling for body weight in the WHR, the WHR was no longer significantly associated with any of the dating preference variables. This finding suggests that

perhaps the largest contributor to being considered dateable as a woman is relatively low body weight. Indeed, low body weight was strongly associated with being ratings of attractiveness, as assessed by observers at zero-acquaintance. After controlling for observer ratings of overall attractiveness through photographs (which may again be driving associations with dateability), BMI remained moderately associated with Dateability ($r = -.22$, $p < .01$), suggesting there being of lower weight is associated with being more attractive as a potential mate above and beyond general attractiveness.

Given that the WHR may have a non-linear relationship with dateability (e.g., women with very low and very high may be perceived as least attractive), regression analyses were conducted using linear, quadratic, and cubic functions of the WHR predicting women's dateability. There were no significant non-linear relationships for WHR with dateability, suggesting that there is no possibility that women's dateability is low at very low and very high levels of WHR but high at average levels of WHR. Taken with the other results, there is little evidence to suggest that the WHR is uniquely important in enhancing a women's mate value during in person interactions, and moreover, there was no indication of a non-linear relationship. Thus, it is reasonable to conclude that the WHR was not a salient indicator of women's attractiveness as a potential mate during speed dating interactions in the current sample. Instead, the primary "action" resulting in greater mate value for women (and general perceived attractiveness through photographs) was being of a lower body weight.

CHAPTER SIX
DISCUSSION

The current study aimed to evaluate whether attributes that are theorized to be linked to greater reproductive fitness enhance one's mate value even upon first meeting. Using a speed-dating design, college-aged individuals were asked to interact with one another in opposite sex pairs for five minutes each and then asked to complete a short survey on one another. Each participant also completed a number of self-report questionnaires assessing attributes of psychopathology and personality traits, and each participant's body measurements and photograph was taken. Women were also asked to provide information on their menstrual cycle so as to determine their conception risk at the time of their participation. Using the SRM (Kenny et al., 2006), actor effects for each participant were determined for the meta-perception items (i.e., the degree to which an individual perceives him or herself to be "dateable"), and partner effects for each participant were determined for the partner-rated dating variables (i.e., the degree to which each participant was seen as "dateable" by all of his or her raters). These effects were then correlated with the various individual-level variables such as personality, psychopathology, and the physical indicators including body measurements in order to identify the traits that were considered desirable in a potential mate. That is, traits associated greater "dateability."

There were several important results of the current study. First, there was little distinction between the various items on the Dating Preferences Questionnaire (i.e., participants rating they would consider kissing someone were also likely to rate considering a long-term relationship with that individual). Therefore, based on results from a factor analysis, ratings made by participants were averaged into overarching "Dateability" and "Meta-Dateability" (i.e., measuring the meta-perception) variables. These results suggest that after a five minute interaction, it is difficult for individuals to differentiate between their long- and short-term

romantic interests. Another possibility is that an overarching "halo" effect emerged, such that men and women who rated wanting to have a short-term relationship with the opposite sex were more likely to rate wanting other types of relationships with that person more favorably. Absolute rank items from the Sociometric Scale were also included for analysis in the SRM. These absolute rank items asked each participant to rank all of the members of the opposite sex with whom he or she interacted from most to least attractive, and most likely to least likely to consider a short-term and long-term relationship. These rank items provided additional measures of 'dateability', thereby allowing us to evaluate the robustness of our findings.

There was little indication in the current data that the "choosier" sex is the one that is seated (counter to a finding from Finkel & Eastwick, 2009). Instead, the current study found that men, on average, made higher ratings than women across all of the dating items. This finding is consistent with the basic evolutionary principle that the sex that invests the most in offspring will also be the choosier sex (i.e., parental investment theory; Trivers, 1972). It is also consistent with error management theory (Haselton & Buss, 2000), which posits that human judgment errors will be biased in the direction of what is less costly in evolutionary terms. For men, underestimating a woman's sexual interest could result in missed sexual opportunities. Consequently, men are more likely to be willing to engage in sex with women than vice versa. By contrast, because the cost of sexual relationships may be higher for women (i.e., because they could become pregnant and have greater parental investment in raising their young), they would not make the same error. Results of the current study are consistent with core ideas in evolutionary psychology, such that men reported more sexual interest in women than women did in men, and men reported greater interest in women across a number of variables.

Importantly, there was good agreement between the SRM results and those obtained via observer ratings of participant photographs, suggesting that ratings made at zero-acquaintance and ratings made based on five minute "thin-slice" interactions are consistent with one another. In addition, some observer-ratings of participant personality were correlated with the participants' self-reports of personality traits, suggesting that observers are able to identify personality traits relatively well through just a photograph. This finding is consistent with zero-acquaintance literature which suggests that humans are reasonably accurate at identifying personality traits in others based on photographs alone (e.g., Little & Perrett, 2007; Willis & Todorov, 2006).

Interestingly, it seemed that it was easier for observers to accurately identify traits of dominance in men through photographs. Moreover, observers were able to identify traits of warmth in women through photographs, but this was not to a significantly higher degree than detecting the trait in men. Wiggins (1991) argues that traits of 'agency' have historically been considered masculine, whereas traits of 'communion' have historically been considered feminine. These points are consistent with the findings in the current study, such that observers were able to detect 'warmth' in women, and they were more accurate in their perceptions of 'dominance' in men but not women through photographs. Moreover, men in speed-dating sessions were more likely to rate women as dateable when the women were rated as less dominant and more warm in their photographs by observers. Women, by contrast, rated men in speed dating sessions as more dateable who were rated as more dominant in their photographs by observers. These findings also persisted to individuals' self-reports of these personality traits, such that women self-reporting higher levels of Extraversion and Cheerfulness were rated as more dateable, whereas men self-reporting higher levels of Assertiveness were rated as more

dateable. For personality traits, women self-reporting lower dutifulness were also rated as more dateable.

In regards to psychopathology, women who self-reported higher degrees of externalizing psychopathology and rule breaking behavior were rated as more dateable. Importantly, after controlling for the personality trait of Extraversion, women's dateability was no longer significantly related to externalizing psychopathology, but greater rule breaking behavior remained associated with greater dateability. It also seemed that after controlling for the item assessing alcohol consumption within the Rule Breaking scale on the ASR, there was no longer a significant association between Rule Breaking and Dateability for women. Thus, it seems for women, being less dutiful and engaging in more rule-breaking behaviors, particularly alcohol consumption, increased mate value. Men's dateability was greater when they self-reported lower levels of anxiety and depressive symptoms, even after controlling for their attractiveness as measured by observers.

Finally, in regards to physical indicators of reproductive fitness, the current study found that the SHR or other body measurements were unrelated to perceptions of dateability in men even though they were associated with greater ratings of attractiveness by observers rating photographs. For women, there was no indication that their stage of menstrual cycle was related to their ratings of other men, other men's ratings of them, or their perceptions of how likely they were to perceive themselves as dateable. However, women who were not on hormonal contraceptives were viewed as less attractive (via observer ratings of photographs) and were less likely to be considered for a short-term (and maybe long term) relationship as compared to women on hormonal contraceptives. This finding suggests that the selection of college-aged women not on hormonal contraceptives (a necessary criteria when evaluating effects of the

menstrual cycle) may result in a biased sample of women. Moreover, after controlling for their BMI, women's WHR was no longer related to dateability. Importantly, however, being of low body weight seemed to be largely associated with being rated as more dateable and as more attractive as assessed by observer ratings of photographs.

Put it all together: What determines mate value in college-aged men?

Collectively, the findings in the current paper are largely consistent with evolutionary theories of mate selection. Specifically, evolutionary theory suggests that women value traits in men that would be indicators that they will be able to provide for and care for them and their offspring (Li, 2007; 2008). In addition, markers of being a good parent would be especially important when considering long-term mates (Li & Kenrick, 2006). Accordingly, because other research has suggested that more assertive individuals may be more successful in their careers and earn higher incomes (Sutin, Costa, Miech, & Eaton, 2009), it follows that traits of dominance and assertiveness may therefore be useful when women select a mate. It may also be the case that men high on dominance and assertiveness are more likely to protect their young and their female mates in the face of danger or adversity. Moreover, the current study found that men self-reporting lower rates of Neuroticism (particularly Anger) and lower rates of Internalizing psychopathology (particularly Anxious-Depressed psychopathology) were perceived to be more dateable. Again, this finding may indicate that women are able to "weed out" potential partners who are depressed and/or have high levels of anger because these men may not prove to be suitable parents for their offspring.

In contrast to personality traits, there were no physical indicators of reproductive fitness (i.e., the SHR and other body measurements) that were associated with perceptions of dateability in men. It seems therefore, for men, body shape seems to be much less of a factor in perceived

mate value compared to women. Nonetheless, it does seem that men with a more "v-shaped" torso were rated as more attractive by observers through photographs at zero-acquaintance, suggesting that the SHR may play a role in enhancing a man's general attractiveness, but not his mate value per se. Given that physical strength may have been particularly important in time periods when men had to physically hunt for food, it may be that in the current age, traits of dominance are most relevant for women to "select on" because they suggest that the man can find and establish a successful career (and thereby provide for her offspring). In addition, traits of dominance may not necessarily relate to physical strength. These findings suggest that upon first meeting, women are relatively good at being able to select potential partners that have some traits that would be considered advantageous according to evolutionary theories of mate selection.

Put it all together: What determines mate value in college-aged women?

Evolutionary theory predicts that men should choose mates that are young, fertile, and attractive (Buss & Schmitt, 1993). Much has already been made of the selection of youth – however, as the sample in the current study consisted entirely of young males and females, this element was necessarily present in all cases. Results of the current study indeed suggest that attractive females (as assessed by observers) were indeed perceived as more dateable. Observer ratings of attractiveness through photographs and partner effects of Dateability were correlated quite highly for women ($r = .63$, $p < .01$), suggesting that a large component of women's mate value in the current sample was simply her attractiveness level.

Beyond physical attractiveness, evolutionary theory predicts that men should also choose mates for the long term that have qualities of a good parent (Li & Kenrick, 2006). In particular, warmth and affiliation in women increased their mate value in the current data. One possible

explanation for this finding is that warmth and affiliation are relevant as mate selection criteria because, when these traits are present in mothers, their children evidence better emotional and social adjustment (e.g., Chen, Liu, & Li, 2000). Moreover, greater warmth and positive emotions in both men and women has been found to be associated with greater relationship satisfaction for both partners within a couple (see e.g., Dyrenforth, Kashy, Donnellan, & Lucas, 2010; Humbad, Donnellan, Iacono, & Burt, 2010). Thus, women high in warmth and affiliation may also behave more positively towards their partners, thereby increasing their relationship quality. These findings provide evidence that men may generally be more attracted to potential mates who self-report higher levels of personality traits that are important for relationships. Men may therefore be able to accurately select "good" partners upon first meeting, at least in regards to traits of warmth.

Interestingly, women who self-reported being less dutiful (e.g., following the rules, behaving properly, following directions) and having higher rates of Externalizing psychopathology and Rule Breaking behaviors were perceived as more dateable. Although this finding is inconsistent with evolutionary literature regarding long term mate selection as well as the findings of warmth above (i.e., generally, low warmth is associated with greater tendencies for antisocial behavior, see e.g., Miller, Lynam, & Leukenfeld, 2003), it may be the case that the rule-breaking behavior in college-aged women is related to something besides a general antisocial behavior that would prove costly in evolutionary terms when it comes to parenting behaviors (see Belsky & Barends, 2002). One possibility is that women who are more likely to be rule-breakers have sex more easily. Thus, there may be an advantage for men to be attracted to 'rule-breaking' women in the short-term. Specifically, for the age group in the current study in particular, it may be easier for a man to secure a sexual relationship with a woman (and thereby

increase his chances of reproductive success) who is more willing to break rules and engage in potentially risky behaviors.

In regards to physical indicators of reproductive fitness, the current study found no indication that fluctuations in women's menstrual cycles were related to their self-perceptions of how dateable they were, how dateable they were rated by men, nor was the stage of menstrual cycle related to women's ratings of men's dateability. Indeed, the current study found that women taking hormonal contraceptives may differ from women not taking hormonal contraceptives in key areas. For example, women on hormonal contraceptives were more likely to be considered for short term (and maybe long term) relationships and to be viewed as attractive (as assessed by observers through photographs) as compared to women not on hormonal contraceptives. As such, caution should be taken when interpreting findings that suggest influences of the menstrual cycle given there may be some differences between women who are versus are not taking hormonal contraceptives.

The current study also found that a lower WHR, which is thought to be an important indicator of reproductive fitness in women, was indeed correlated with being perceived as more dateable and more attractive as assessed by observers through photographs. Importantly, however, this relationship was entirely driven by body weight, such that after controlling for body weight, WHR was no longer associated with Dateability. The largest correlational association between individual-level variables and dateability across the entire current study was indeed for the relationship between low body weight and greater dateability. Considering that physical health is a particularly salient indicator of reproductive fitness for women because they must physically bear the child (e.g., Shackelford et al., 2005; Singh, 1993), it may be that men are less likely to rate a woman who is overweight as dateable perhaps because being overweight

is associated with many health problems (see Pi-Sunyer, 1991 and Van Itallie, 1985 for summaries). It may also be that overweight females are not perceived to be as attractive as women who are of average weight (as evidenced through correlations between greater observer rated attractiveness and lower body weight), and a large component of men's ratings of women's dateability was driven by attractiveness. These findings are consistent with evolutionary theories of mate selection which also theorize that women who are attractive, youthful, and healthy should have the greatest mate value (Buss & Schmitt, 1993). It may be that these findings are specific to the western culture of the United States, in which thinner women are often perceived as more attractive. Indeed, these findings may not generalize to samples in other countries where a different body shape may be perceived as ideal. Nonetheless, it seems that women of greater body weight were viewed as less dateable in the current sample.

Overall, it seems that men and women in the current sample were more attracted to members of the opposite sex based on characteristics that were, for the most part, rooted in evolutionary theories of mate selection. Men were generally attracted to women who were of lower body weight (i.e., possibly healthier), were more extraverted and warm (i.e., traits of a good parent), and less dutiful and more likely to break rules (i.e., traits that may make it easier to secure a sexual relationship). Women were generally attracted to men who were assertive (i.e., a trait related to career success) and low on traits of anxiety, depression, and anger (i.e., traits of a good parent).

Limitations

Although the current study is the first to find that traits associated with greater reproductive fitness make a person more appealing as a potential mate after short, first impression interactions, there are some limitations worth noting. First, the current sample

consisted only of college-aged participants between 18 and 20 years of age. Thus, these results may not replicate in a sample of adults in their mid- to late- 20s or early 30s. Findings in the current study such as men and women in the current sample were unable to distinguish between considering someone for a short-term versus long term relationship may reflect that in a college-aged sample, individuals may not be looking for a long term relationship. A study with a sample of adults post-graduation who are specifically looking to "settle down" may result in significantly different findings.

Another limitation in the current sample was that there were several participants who were not honest about their relationship status. Results of analyses comparing those nineteen participants to the remainder sample revealed that individuals in relationships were indeed more conservative in their ratings of dateability of with whom they interacted. Given that removing these individuals would have greatly limited the sample size of the current study (i.e., because the entire group would have to be dropped from analyses), this problem may have created additional noise in the data. Future studies may want to avoid the use of samples based on psychology subject pools so as to alleviate some of these problems with participants being dishonest about their relationship status.

There were also significant limitations in the assessment of conception risk based on the menstrual cycle data. First, less than half of the women in the current sample were not taking hormonal contraceptives and did not have any missing data for menstrual cycle reports, which significantly limited the final sample size to detect effects. In addition, conception risk for women was calculated with reliance on self-report and with the assumption that women were normally ovulating. Future research should conduct more thorough evaluations of menstrual

cycle history in order to obtain more reliable estimates of conception risk at the time of participation.

Finally, the current study was entirely cross-sectional in nature, such that it is impossible to know whether a participant rating wanting to consider a long term relationship with a person would actually follow through with and date that person. Future research may therefore want to follow up opposite-sex pairs in the current study to see whether there was any interaction or dating after the completion of the study and if these dates led to a more serious relationship. Perhaps by recruiting a sample consisting entirely of participants specifically looking to meet someone for a relationship, there would be greater feasibility of following-up with participants longitudinally to examine whether their initial ratings of dateability persist to actual selection processes.

Final thought

Overall, the current study is the first to examine evolutionary indicators of reproductive fitness and how they relate to in-vivo mate selection processes. Although there was no evidence that many of the physical indicators (aside from low body weight for women) were related to greater ratings of dateability even though they seemed related to general attractiveness as assessed by observers through photographs, it is evident that certain personality traits and psychopathology were related to increased perceptions of dateability in both women and men. This research not only highlights the importance of first impressions, but also the utility and relative accuracy of the formation of first impressions for mate selection. Indeed, it seems that at least for college-aged students, individuals are attracted to potential mates that possess many of the characteristics that would increase reproductive fitness.

FOOTNOTES

Footnotes

1. Following Gangestad et al. (2007), another method was also used to calculate conception risk but was not used in the current paper because it had greater missing data. In this method, each woman was put on a 29-day cycle based on her calculated cycle length in order to determine her day in the 29-day cycle, and then her conception risk was determined again from the actuarial tables reported in Wilcox et al. (2001). In this model, ovulation was estimated to fall approximately 15 days prior to the end of a typical 29-day cycle (i.e., Day 14). Conception risk using this method and the method discussed in the current paper were correlated highly ($r = .60$, $p < .05$).

APPENDICES

Appendix A

Table A.1
List of All Measures Included in the Entire Study.

Measure	**Citation**
"Would you say you had sex if…"	Sanders, S. A., & Reinisch, J. M. (1999). Would you say you "had sex" if…? *Journal of the American Medical Association, 281,* 275-277.
"Would you say you hooked up if…"	None – modified from Sanders & Reinisch (1999).
Achenbach Adult Self Report*	Achenbach, T. M., & Rescorla, L. A. (2003). *Manual for ASEBA Adult Forms Profiles.* Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.
Alcohol Use Inventory	None – developed by author.
Autism Spectrum Quotient	Baron-Cohen, S., Wheelwright, S., Skinner, R., Martin, J., Clubley, E. (2001). The Autism Spectrum Quotient (AQ): Evidence from asperger syndrome/high functioning autism, males and females, scientists and mathematicians. *Journal of Autism Developmental Disorders, 31,* 5–17.
Body Measurements*	None – developed by author.
Campbell Entitlement Scale	Campbell, W. K., Bonacci, A. M., Shelton, J., Exline, J. J., & Bushman, B. J. (2004). Psychological entitlement: Interpersonal consequences and validation of a new self-report measure. *Journal of Personality Assessment*, *83*, 29-45.
Dating Preferences*	None – developed by author.
Experiences in Close Relationships Scale	Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult romantic attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46-76). New York: Guilford Press.
Health Questionnaire	Watson, D., & Pennebaker, J.W. (1989). Health complaints, stress, and distress: Exploring the central role of Negative Affectivity. *Psychological Review, 96,* 234-254
International Personality Item Pool*	Goldberg, L. R. (1999). A broad-bandwidth, public-domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. J. Deary, F. De Fruyt, and F. Ostendorf (Eds.), *Personality psychology in Europe* (Vol. 7, pp. 7-28). Tilburg, The Netherlands: Tilburg University Press.
Menstrual Cycle Questionnaire*	None – developed by author.

Table A.1 (cont'd)

Mini International Personality Item Pool	Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP Scales: Tiny-Yet-Effective Measures of the Big Five Factors of Personality. *Psychological Assessment, 18,* 192-203.
Narcissistic Grandiosity Scale	Rosenthal, S. A., Hooley, J. M., & Steshenko, Y. (2007). *Distinguishing grandiosity from self-esteem: Development of the Narcissistic Grandiosity Scale*. Manuscript in preparation.
Narcissistic Personality Inventory	Raskin, R. & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology,* 54, 890-902.
Photograph Ratings*	None – developed by author.
Religiosity	None – developed by author.
Rosenberg's Self-Esteem Scale	Rosenberg, M. (1965). *Society and adolescent self-image,* Princeton, NJ: Princeton University.
Sociometric Scale*	None – developed by author.
Sociosexual Orientation Inventory	Simpson, J. A., & Gangestad, S. W. (1991). Individual differences in sociosexuality: Evidence for convergent and discriminant validity. *Journal of Personality and Social Psychology, 60,* 870-883.
Subtypes of Antisocial Behavior*	Burt, S. A., & Donnellan, M. B. (2009). Development and validation of the Subtypes of Antisocial Behavior Questionnaire. *Aggressive Behavior, 35,* 376-398.

Note: * indicates a measure that was used in the current paper.

Appendix B

Table B.1

Descriptions and Reliabilities of Scales in the International Personality Item Pool and Achenbach Adult Self-Report

	Items	Reliability (Alpha)	Description of High Scorers
International Personality Item Pool			
Agreeableness	24	.85	
Trust	4	.81	Believing most people are fair and honest
Morality	4	.73	Candid, frank, and honest about self with others
Altruism	4	.71	Find helping other people rewarding
Cooperation	4	.71	Dislike confrontation
Modesty	4	.68	Do not claim they are better than other people
Sympathy	4	.67	Compassionate, feel the pain of others
Conscientiousness	24	.88	
Self-Efficacy	4	.67	Confident in one's ability to accomplish things
Orderliness	4	.82	Well-organized, adhere to routine, make plans
Dutifulness	4	.53	Follow rules, abide by contracts
Achievement-Striving	4	.75	Driven to achieve excellence
Self-Discipline	4	.64	High will-power and self-discipline
Cautiousness	4	.86	Thinking through consequences before acting
Extraversion	24	.84	
Friendliness	4	.68	Liking other people, making friends quickly
Gregariousness	4	.72	Enjoying being with others, enjoying crowds
Assertiveness	4	.84	Taking charge, directing others
Activity Level	4	.70	Enjoying a fast-paced life
Excitement-Seeking	4	.67	Boredom without high levels of stimulation
Cheerfulness	4	.75	Experience greater positive emotions
Neuroticism	24	.85	
Anxiety	4	.70	Anxious, tense, nervous easily
Anger	4	.81	Feeling enraged when things do not go their way
Depression	4	.80	Feelings of sadness, lack of energy
Self-Consciousness	4	.68	Sensitivity to others' comments

Table B.1 (Cont'd)

Immoderation	4	.66	Impulsive, difficulty resisting urges
Vulnerability	4	.72	Panic and helplessness when under pressure
Openness	24	.81	
Imagination	4	.70	Use fantasy to create a more interesting world
Artistic Interests	4	.74	Love beauty, both in art and in nature
Emotionality	4	.61	Good access to and awareness of own feelings
Adventurousness	4	.59	Like to try new activities, novel places, etc.
Intellect	4	.71	Play with ideas, open-minded to new ideas
Liberalism	4	.61	More likely to challenge authority and convention
Achenbach Adult Self-Report			
Internalizing	27	.85	
Withdrawn	9	.67	Would rather be alone
Anxious-Depressed	18	.86	Sad, nervous, worries, feels worthless, etc.
Externalizing	29	.85	
Rule-Breaking	14	.79	Lies, steals, gets drunk, etc.
Aggression	15	.79	Fights, mean, argues, attacks others, etc.

Table B.2
Descriptive Statistics of Dating Preferences Items and Factors

Item	Overall Mean (SD)	Men Mean (SD)	Women Mean (SD)	Effect Size
1. Friendship	5.61 (1.4)	5.53 (1.3)	5.70 (1.4)	-.15*
2. Kissing	3.52 (1.8)	3.98 (1.8)	3.07 (1.7)	.69*
3. Hooking Up	3.10 (1.8)	3.72 (1.9)	2.48 (1.6)	.94*
4. One Night Stand	2.49 (1.8)	3.30 (2.0)	1.67 (1.2)	1.3*
5. Short Term Relationship	2.88 (1.6)	3.19 (1.6)	2.58 (1.5)	.48*
6. Long Term Relationship	2.65 (1.6)	2.93 (1.6)	2.38 (1.5)	.44*
7. Very Long Term Relationship	2.38 (1.5)	2.63 (1.5)	2.14 (1.4)	.41*
8. Physically Attracted	3.53 (1.8)	3.83 (1.8)	3.23 (1.7)	.46*
9. Emotionally Attracted	3.36 (1.6)	3.63 (1.5)	3.09 (1.7)	.43*
10. Friendship (Meta)	5.00 (1.2)	4.96 (1.1)	5.03 (1.3)	-.07
11. Kissing (Meta)	3.87 (1.4)	4.07 (1.2)	3.67 (1.5)	.34*
12. Hooking Up (Meta)	3.56 (1.4)	3.76 (1.3)	3.35 (1.5)	.34*
13. One Night Stand (Meta)	3.09 (1.6)	3.25 (1.5)	2.94 (1.6)	.25*
14. Short Term Relationship (Meta)	3.21 (1.4)	3.42 (1.2)	3.00 (1.5)	.36*
15. Long Term Relationship (Meta)	3.01 (1.3)	3.25 (1.2)	2.76 (1.4)	.43*
16. Very Long Term Relationship (Meta)	2.66 (1.3)	2.80 (1.2)	2.52 (1.4)	.25*
17. Physically Attracted (Meta)	3.96 (1.3)	4.17 (1.2)	3.76 (1.4)	.36*
18. Overall Attractiveness	4.05 (1.4)	4.21 (1.4)	3.88 (1.4)	.28*
Factors				
Dateability	3.18 (1.4)	3.58 (1.5)	2.78 (1.3)	.68*
Meta-Dateability	3.31 (1.2)	3.52 (1.1)	3.11 (1.3)	.38*

Note. All items are based on 1,630 ratings (i.e., 387 participants) with the exception of Items 7 and 16, which were based on 354 ratings (i.e., 94 participants). Items 1-7 use the prompt, "Would you consider [having a] [insert item] with the person?" Items 8-9 use the prompt, "Are you [insert item] to the person?" Items 10-16 assess meta-perceptions and use the prompt, "Do you think this person wants to [have a] [insert item] with you?" Item 17 uses the prompt, "Do you think this person is physically attracted to you?" Items 1-17 were rated on a 7-point scale ranging from "Definitely No" to "Definitely Yes." Item 18 uses the prompt, "Compared to the average person, how physically attractive is this person?" and was rated on a 7-point scale ranging from "Not at All Physically Attractive" to "Very Physically Attractive." Dateability is an average of Items 2-9 and 18. Meta-Dateability is an average of Items 11-17. * $p < .05$.

Table B.3

Social Relations Model Variance Partitioning

Variable	Men Rating Women				Women Rating Men			
	Relative Percentage of Variance			Total	Relative Percentage of Variance			Total
	Actor	Partner	Relationship		Actor	Partner	Relationship	
Dateability	28.3**	**41.5****	30.2	2.26	29.8**	**28.8****	41.4	1.67
Meta-Dateability	**56.2****	7.7**	36.1	1.16	**75.0****	2.6*	22.4	1.73
Attractiveness Rank	0	**58.0****	42.0	2.03	0	**41.2****	58.8	1.84
Short term Dating Rank	0	**41.0****	59.0	1.98	0	**17.8****	82.2	1.83
Long term Dating Rank	0	**36.3****	63.7	1.98	0	**31.7****	68.3	1.81

Note. Estimates of parameters obtained from BLOCKO and aggregated in SAS. Relative Percentage of Variance is the variance of the effect (i.e., actor, partner, or relationship) divided by the total variance. Bolded estimates are those of interest in the current paper. *$p < .05$ **$p < .01$.

Table B.4

Zero-order Correlations Between Items of Observer Ratings of Photographs

	1.	2.	3.	4.	5.	6.	7.	8.
1. Dressed Sexually Provocatively	---	.91**	.17**	.16*	-.08	-.03	.11	.12
2. Revealing Skin	.77**	---	.15*	.11	-.03	.00	.11	.10
3. Well-Groomed	.15*	.19*	---	-.12	.49**	.68**	.80**	.77**
4. Dominant	.32**	.28**	.42**	---	-.49**	-.38**	-.18**	-.12
5. Warm	.01	.00	.06	-.44**	---	.88**	.57**	.47**
6. Others would want to be Friends	.01	-.01	.34**	-.11	.83**	---	.82**	.74**
7. Others would want to Date	.23**	.20**	.62**	.57**	.15*	.57**	---	.97**
8. Overall Attractiveness	.27**	.22**	.61**	.60**	.05	.46**	.93**	---

Note. N = 386 participants (1 individual was missing a photograph). Correlations for men are presented below the diagonal, and correlations for women are presented above the diagonal. *$p < .05$ **$p < .01$

Table B.5

Correlations Between Observer Ratings of Photographs and Dating Preference Variables from Speed Dating Sessions

	Dateability	Meta-Dateability	Attractiveness Rank	Short Term Rank	Long Term Rank
Men					
Dressed Sexually Provocatively	.18*	.03	.13	.13	.11
Revealing Skin	.13	.01	.08	.08	.08
Well-Groomed	.37**	.15*	.36**	.37**	.29**
Dominant	.41**	.15*	.42**	.33**	.26**
Warm	-.06	-.07	-.08	-.02	-.02
Others would want to be Friends	.17*	-.02	.16*	.17*	.18*
Others would want to Date	.51**	.11	.49**	.40**	.38**
Overall Attractiveness	.47**	.14	.46**	.38**	.35**
Women					
Dressed Sexually Provocatively	.00	.09	.05	.03	.01
Revealing Skin	-.02	.06	.03	.00	.02
Well-Groomed	.52**	.18*	.56**	.43**	.41**
Dominant	-.18*	.02	-.17*	-.09	-.17*
Warm	.41**	.10	.39**	.32**	.36**
Others would want to be Friends	.55**	.19**	.54**	.46**	.47**
Others would want to Date	.64**	.27**	.65**	.55**	.51**
Overall Attractiveness	.63**	.29**	.64**	.55**	.50**

Note. N = 188 men and 199 women. "Dateability," "Attractiveness Rank," "Short Term Rank," and "Long Term Rank" are based on partner effects from the SRM. "Meta-Dateability" is based on actor effects from the SRM. *$p < .05$ **$p < .01$

Table B.6

Correlations Between "Dominant," "Warm," and "Overall Attractiveness" Observer Ratings of Targets' Photographs and Targets' Self-Reports for Personality Variables

	Observer Ratings of Photographs					
	Men			Women		
	Dominant	Warm	ATT	Dominant	Warm	ATT
Personality						
Agreeableness	-.16*	.15*	-.04	-.09	.11	.03
Trust	-.17**	.12	-.07	-.07	.09	-.04
Morality	-.06	.09	.00	.06	.03	.07
Altruism	.00	.11	.08	-.07	.11	-.02
Cooperation	-.20**	.12	-.05	-.07	.05	.13
Modesty	-.10	-.01	-.12	-.20**	.06	.00
Sympathy	-.06	.13*	.05	.03	.07	-.04
Conscientiousness	.12	-.03	.10	-.04	.11	.07
Self-Efficacy	.10	.08	.17*	.08	.09	.08
Orderliness	.19**	-.14	.11	-.07	.06	.13
Dutifulness	.00	.04	.05	.02	-.02	-.04
Achievement-Striving	.16*	.01	.11	-.09	.12	.07
Self-Discipline	.11	-.11	.05	.05	.01	.00
Cautiousness	-.03	.06	-.01	-.08	.14	.02
Extraversion	.25**	.05	.30**	.03	.16*	.12
Friendliness	.08	.11	.13	.00	.19**	.09
Gregariousness	.09	.07	.15*	-.01	.16*	.13
Assertiveness	.30**	-.02	.25**	.09	-.02	-.09
Activity Level	.26**	-.06	.21**	-.05	.07	.04
Excitement-Seeking	.18*	-.05	.24**	.00	.07	.13
Cheerfulness	.04	.13	.16*	.07	.18*	.18*
Neuroticism	-.06	-.09	-.15*	-.02	.05	-.03
Anxiety	-.09	-.06	-.10	.01	-.02	.00
Anger	.14	-.15*	-.05	-.01	.06	-.06
Depression	-.06	-.08	-.12	.02	-.02	-.16*
Self-Consciousness	-.14	-.07	-.19*	-.02	-.04	-.03
Immodesty	-.01	.08	.03	-.03	.12	.06
Vulnerability	-.09	-.04	-.12	-.07	.11	.09
Openness	-.08	.10	.05	.03	-.01	-.05
Imagination	-.01	.05	.09	-.04	-.03	.03
Artistic Interests	-.07	.02	-.03	.01	-.01	-.02
Emotionality	.07	.06	.11	.02	.10	-.03
Adventurousness	.03	.10	.13	.02	-.01	-.08
Intellect	-.11	.14	.04	.04	-.04	-.02
Liberalism	-.18*	.02	-.12	.04	-.03	-.08

Note. N = 188 men and 199 women. ATT represents Overall Attractiveness. *$p < .05$ **$p < .01$

Table B.7

Correlations Between Self-Reported Personality Traits and Dating Preference Variables from Speed Dating Sessions for Men

	Dateability	Meta-Dateability	ATT Rank	Short Term Rank	Long Term Rank
Agreeableness	-.07	-.19**	-.10	-.03	.03
Trust	-.14	-.09	-.20**	-.14	-.12
Morality	-.03	-.23**	-.02	0	.05
Altruism	-.05	0	-.04	.03	.08
Cooperation	.04	-.08	0	-.01	.03
Modesty	-.05	-.30**	-.05	-.01	.06
Sympathy	-.04	-.01	-.05	.04	.05
Conscientiousness	.08	0	.07	.12	.11
Self-Efficacy	.09	.11	.08	.11	.09
Orderliness	.06	.09	.10	.01	.01
Dutifulness	.01	-.11	.01	.02	.01
Achievement-Striving	.07	-.01	.04	.14	.16*
Self-Discipline	.07	-.02	.05	.12	.09
Cautiousness	.05	-.05	.02	.10	.10
Extraversion	.20**	.10	.15*	.16*	.16*
Friendliness	.03	.06	-.03	.02	.01
Gregariousness	.13	.03	.09	.10	.09
Assertiveness	.24**	.16*	.22**	.23**	.22**
Activity Level	.14	.03	.13	.20**	.16
Excitement-Seeking	.14	.10	.13	.05	.09
Cheerfulness	.09	.01	.04	.02	.03
Neuroticism	-.15*	.06	-.07	-.09	-.10
Anxiety	-.09	.03	0	-.04	-.07
Anger	-.14*	.06	-.10	-.09	-.07
Depression	-.10	-.05	0	-.02	-.03
Self-Consciousness	-.14	-.06	-.13	-.15	-.11
Immodesty	-.01	.18*	0	-.05	-.10
Vulnerability	-.05	.07	-.01	.03	.01
Openness	.02	.06	-.02	0	.05
Imagination	0	0	.01	.01	.03
Artistic Interests	.03	-.01	-.02	.01	.09
Emotionality	.14	.05	.09	.12	.17*
Adventurousness	.05	.02	-.01	-.02	.01
Intellect	-.01	.11	-.02	0	.04
Liberalism	-.12	.05	-.12	-.13	-.16

Note. N = 156-188 men. ATT represents Attractiveness. *$p < .05$ **$p < .01$

Table B.8

Correlations Between Self-Reported Personality Traits and Dating Preference Variables from Speed Dating Sessions for Women

	Dateability	Meta-Dateability	ATT Rank	Short Term Rank	Long Term Rank
Agreeableness	-.08	-.11	-.05	-.00	-.00
Trust	-.12	-.04	-.13	-.11	-.09
Morality	.00	-.12	.02	.04	-.01
Altruism	.04	-.01	.07	.06	.10
Cooperation	-.01	-.07	.01	.07	.08
Modesty	-.06	-.12	-.04	-.00	-.04
Sympathy	-.09	-.03	-.08	-.06	-.01
Conscientiousness	.00	-.01	.04	.06	.05
Self-Efficacy	.04	.15*	.10	.06	.12
Orderliness	.11	.04	.11	.14	.09
Dutifulness	-.18**	-.09	-.10	-.08	-.10
Achievement-Striving	.06	.10	.11	.08	.08
Self-Discipline	-.04	-.04	.01	.03	-.02
Cautiousness	-.05	-.16*	-.08	-.03	-.00
Extraversion	.18*	.20**	.14*	.12	.13
Friendliness	.14*	.12	.10	.06	.08
Gregariousness	.13	.06	.06	.09	.09
Assertiveness	.07	.21**	.07	-.01	.04
Activity Level	.06	.18*	.08	.10	.04
Excitement-Seeking	.19**	.16*	.16*	.13	.13
Cheerfulness	.07	.00	.08	.08	.10
Neuroticism	-.01	.02	-.00	-.00	-.05
Anxiety	-.03	-.04	-.03	-.09	-.11
Anger	.00	.01	.02	.01	-.06
Depression	-.03	.04	-.05	-.01	-.07
Self-Consciousness	-.14	-.12	-.07	-.08	-.12
Immodesty	.07	.14*	.03	.06	.11
Vulnerability	.09	.05	.08	.09	.06
Openness	-.04	.17*	-.08	-.05	.01
Imagination	.05	.15*	.04	-.02	.01
Artistic Interests	-.04	.08	-.03	.01	.02
Emotionality	.03	.05	.04	.11	.13
Adventurousness	-.02	.12	-.11	-.06	-.02
Intellect	-.04	.07	-.09	-.10	-.09
Liberalism	-.10	.16*	-.13	-.09	-.02

Note. N = 163-198 women. ATT represents Attractiveness. *$p < .05$ **$p < .01$

Table B.9

Correlations Between Self-Reported Psychopathology and Dating Preference Variables from Speed Dating Sessions

	Dateability	Meta-Dateability	ATT Rank	Short term Rank	Long term Rank
Men					
STAB - Aggression	.06	.10	.09	0	-.01
STAB – Rule-Breaking	.09	.09	.11	.04	0
STAB – Social Aggression	.06	.23**	.03	.01	0
ASR - Internalizing	-.19**	.13	-.09	-.24**	-.25**
ASR – Anxious-Depressed	-.15*	.10	-.04	-.19*	-.21**
ASR – Withdrawn	-.05	.08	.01	-.08	-.10
ASR – Externalizing	-.01	.23**	.08	-.05	-.09
ASR – Aggressive Behavior	-.07	.12	.06	-.07	-.08
ASR – Rule Breaking	.04	.18*	.09	.01	-.05
Women					
STAB - Aggression	-.04	.02	-.05	-.10	-.15
STAB – Rule-Breaking	-.02	.08	-.01	-.11	-.12
STAB – Social Aggression	.11	.10	.06	.03	-.02
ASR - Internalizing	-.02	.05	-.05	-.06	-.05
ASR – Anxious-Depressed	-.02	.03	-.06	-.05	-.04
ASR – Withdrawn	-.06	-.04	-.05	-.03	-.01
ASR – Externalizing	.15*	.17*	.13	.07	.10
ASR – Aggressive Behavior	.05	.03	.04	-.02	.02
ASR – Rule Breaking	.17*	.16*	.15*	.07	.13

Note. N = 387 participants. ATT represents Attractiveness, STAB represents Subtypes of Antisocial Behavior, and ASR represents Achenbach Adult Self-Report. *$p < .05$ **$p < .01$

Table B.10

Correlations Between Physical Body Measurements and Observer Ratings of Photographs

	Height	Weight	WHR	SHR	BMI
Men					
Dressed Sexually Provocatively	-.02	.16*	-.07	-.02	.18*
Revealing Skin	.04	.16*	.00	.04	.16*
Well-Groomed	-.12	-.22**	-.12	.20**	-.19*
Dominant	.16*	.23**	.02	.20**	.17*
Warm	-.20**	-.21**	-.09	-.07	-.13
Others would want to be Friends	-.18*	-.28**	-.16*	.05	-.23**
Others would want to Date	.00	-.21**	-.17*	.25**	-.24**
Overall Attractiveness	.04	-.22**	-.21**	.24**	-.27**
Women					
Dressed Sexually Provocatively	.10	-.01	-.05	.08	-.05
Revealing Skin	.10	-.02	-.06	.09	-.06
Well-Groomed	-.04	-.27**	-.07	.11	-.28**
Dominant	.10	.28**	.19**	-.01	.27**
Warm	-.17*	-.13	-.02	.06	-.07
Others would want to be Friends	-.14	-.27**	-.07	.10	-.24**
Others would want to Date	-.10	-.45**	-.18*	.13	-.45**
Overall Attractiveness	-.10	-.47**	-.20**	.10	-.46**

Note. N = 386 participants. WHR, SHR, and BMI represent the Waist-to-Hip Ratio, Shoulder-to-Hip Ratio, and Body Mass Index, respectively*$p < .05$ **$p < .01$

Table B.11

Correlations Between Physical Body Measurements and Dating Preference Variables from Speed Dating Sessions

	Dateability	Meta-Dateability	Attractiveness Rank	Short term Rank	Long term Rank
Men					
Height	.09	.02	.03	.08	.11
Weight	-.02	.05	-.05	.03	-.00
Waist-to-Hip Ratio	-.08	.01	-.08	-.02	-.11
Shoulder-to-Hip Ratio	.13	.08	.18*	.09	.04
Body Mass Index	-.07	.06	-.08	-.01	-.06
SHR controlling for Weight	.12	.12	.15	.08	.04
SHR controlling for ATT	.03	.06	.06	-.02	-.05
BMI controlling for ATT	.07	.13	.05	.11	.06
Women					
Height	-.11	-.09	-.03	-.03	-.08
Weight	-.47**	-.26**	-.44**	-.38**	-.37**
Waist-to-Hip Ratio	-.18*	-.06	-.23**	-.19*	-.24**
Shoulder-to-Hip Ratio	.13	.12	.10	.07	-.01
Body Mass Index	-.46**	-.25**	-.46**	-.40**	-.38**
WHR controlling for Weight	0	.04	-.06	-.06	-.11
WHR controlling for ATT	-.05	.01	-.11	-.10	-.15
BMI controlling for ATT	-.22**	-.09	-.23**	-.18*	-.17*

Note. N = 387 participants. *$p < .05$ **$p < .01$

Appendix C

Social Relations Model results for "Friendship" and Meta-Friendship" items with the Dating Preferences variables.

Table C.1
Variance Partitioning in BLOCKO

Variable	Men Rating Women				Women Rating Men			
	Relative Percentage of Variance			Total	Relative Percentage of Variance			Total
	Actor	Partner	Relationship		Actor	Partner	Relationship	
Friendship	36.0**	8.0**	56.0	.30	32.3**	11.5**	56.2	.33
Meta-Friendship	39.8**	2.0	58.2	1.28	40.5**	4.9*	54.6	1.49

Note: N = 387 participants (188 men) and *$p < .05$ **$p < .01$.

Table C.2
Correlations with Observer Ratings of Photographs

	Dressed Sexually Provocatively	Revealing Skin	Well-Groomed	Dominant	Warm	Others Would Want to Be Friends	Others Would Want to Date	Overall Attractiveness
Men								
Friendship	.19**	.11	.21**	.21**	-.01	.13	.27**	.24**
Meta-Friendship	-.09	-.04	.09	-.01	.03	.05	0	0
Women								
Friendship	0	.01	.21**	-.07	.31**	.32**	.29**	.25**
Meta-Friendship	.07	.05	.23**	.02	.20**	.25**	.23**	.21**

Note: N = 387 participants (188 men) and *$p < .05$ **$p < .01$.

Table C.3
Correlations with Personality Variables

	Men		Women	
	Friendship	Meta-Friendship	Friendship	Meta-Friendship
Agreeableness	.01	.13	-.02	.09
Trust	-.06	.20**	-.11	.02
Morality	.03	0	-.01	.08
Altruism	.05	.16*	.04	.22**
Cooperation	.03	.06	-.04	.04
Modesty	-.01	-.06	.00	-.09
Sympathy	.01	.14	.12	.10
Conscientiousness	.04	.05	-.01	.19**
Self-Efficacy	.05	.11	.08	.26**
Orderliness	-.02	.04	.04	.12
Dutifulness	.05	.10	-.09	.03
Achievement-Striving	-.02	.04	.06	.23**
Self-Discipline	.06	.05	-.04	.12
Cautiousness	.07	-.05	-.07	.04
Extraversion	.09	.23**	.25**	.37**
Friendliness	0	.29**	.23**	.31**
Gregariousness	.10	.17*	.18*	.16*
Assertiveness	.14	.10	.14	.23**
Activity Level	.06	.05	.13	.23**
Excitement-Seeking	.01	.12	.09	.18*
Cheerfulness	.03	.17*	.17*	.29**
Neuroticism	-.10	-.11	.04	-.07
Anxiety	-.14	-.04	.04	.05
Anger	-.08	-.07	.03	-.06
Depression	-.03	-.23**	-.02	-.10
Self-Consciousness	-.05	-.15*	-.17*	-.16*
Immodesty	0	.14	.13	.04
Vulnerability	-.09	-.04	.15	-.01
Openness	.04	.17*	-.01	.17*
Imagination	0	.16	-.01	.18
Artistic Interests	.11	.07	-.03	.13
Emotionality	.06	.15*	.13	.12
Adventurousness	.06	.12	-.04	.11
Intellect	.01	.10	-.06	.15
Liberalism	-.07	.05	-.01	-.09

Note: N = 387 participants (188 men) and *$p < .05$ **$p < .01$.

Table C.4

Correlations with Psychopathology and Body Measurements

	Friendship	Meta-Friendship
Men		
STAB - Aggression	-.04	-.02
STAB – Rule-Breaking	.02	-.14
STAB – Social Aggression	-.03	.09
ASR - Internalizing	-.19*	-.07
ASR – Anxious-Depressed	-.17*	-.02
ASR – Withdrawn	-.07	-.18*
ASR – Externalizing	-.03	.03
ASR – Aggressive Behavior	-.10	-.09
ASR – Rule Breaking	.09	.00
Height	.02	.02
Weight	.04	.07
Waist-to-Hip Ratio	-.01	.06
Shoulder-to-Hip Ratio	.01	-.10
Body Mass Index	.03	.06
SHR controlling for Weight	.03	-.09
SHR controlling for ATT	-.04	-.10
BMI controlling for ATT	.11	.04
Women		
STAB - Aggression	.07	-.09
STAB – Rule-Breaking	-.02	-.11
STAB – Social Aggression	.14	-.01
ASR - Internalizing	.01	.03
ASR – Anxious-Depressed	.01	.06
ASR – Withdrawn	-.12	-.07
ASR – Externalizing	.18*	.15*
ASR – Aggressive Behavior	.04	.05
ASR – Rule Breaking	.09	.10
Height	-.14*	-.15*
Weight	-.13	-.08
Waist-to-Hip Ratio	-.10	-.05
Shoulder-to-Hip Ratio	.04	.04
Body Mass Index	-.08	-.03
WHR controlling for Weight	-.09	-.05
WHR controlling for ATT	-.09	-.03
BMI controlling for ATT	0	.10

Note: N = 387 participants (188 men) and *$p < .05$ **$p < .01$.

REFERENCES

References

Achenbach, T. M., & Rescorla, L. A. (2003). *Manual for ASEBA Adult Forms Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.

Ambady, N. & Skowronski, J. J. (2008). *First Impressions.* New York: The Guilford Press.

Ambady, N., Bernieri, F. J., & Richeson, J. A. (2000). Toward a histology of social behavior: Judgmental accuracy from thin slices of the behavioral stream. *Advances in Experimental Social Psychology, 32,* 201-271.

Asepndorpf, J. B., Penke, L., & Back, M. D. (2011). From dating to mating and relating: Predictors of initial and long term outcomes of speed-dating in a community sample. *European Journal of Personality, 25,* 16-30.

Belsky, J., & Barends, N. (2002). Personality and parenting. In M. H. Borstein (Eds.), *Handbook of Parenting: Being and Becoming a Parent* (pp. 415-438). Mahway, NJ: Lawrence Erlbaum Associates, Inc.

Braun, M. F. & Bryan, A. (2006). Female waist-to-hip and male waist-to-shoulder ratios as determinants of romantic partner desirability. *Journal of Social and Personal Relationships, 23,* 805-819.

Burt, S. A., & Donnellan, M. B. (2009). Development and validation of the Subtypes of Antisocial Behavior questionnaire. *Aggressive Behavior, 35,* 376-398.

Buss, D. M. & Barnes, M. (1986). Preferences in human mate selection. *Journal of Personality and Social Psychology, 50*, 559-570.

Buss, D. M. & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review, 100,* 204-232.

Buunk, B. P. & Dijkstra, P. (2005). A narrow waist versus broad shoulders: Sex and age differences in the jealousy-evoking characteristics of a rival's body build. *Personality and Individual Differences, 39*, 379-389.

Carney, D. R., Colvin, C. R., & Hall, J. A. (2007). A thin slice perspective on the accuracy of first impressions. *Journal of Research in Personality, 41,* 1054-1072.

Chen, X., Liu, M., & Li, D. (2000). Parental warmth, control, and indulgence and their relations to adjustment in Chinese children: A longitudinal study. *Journal of Family Psychology, 14,* 401-419.

Costa, P. T. Jr., & McCrae, R. R. (1992). *NEO-PI-R professional manual.* Odessa, FL: Psychological Assessment Resources.

Darwin, C. (1859). *On the origin of the species by means of natural selection, or, preservation of favoured races in the struggle for life.* London: Murray.

Darwin, C. (1871). *The descent of man and selection in relation to sex.* London: Murray.

DeBruine, L., Jones, B. C., Frederick, D. A., Haselton, M. G., Penton-Voak, I. S., & Perrett, D. I. (2010). Evidence for menstrual cycle shifts in women's preferences for masculinity: A response to Harris (in press) "Menstrual Cycle and Facial Preferences Reconsidered." *Evolutionary Psychology, 8,* 768-775.

DePaulo, B. M., Kenny, D. A., Hoover, C. W., Webb, W., & Oliver, P. V. (1987). Accuracy of person perception: Do people know what kinds of impressions they convey. *Journal of Personality and Social Psychology, 52,* 303-315.

Dyrenforth, P. S., Kashy, D. A., Donnellan, M. B., & Lucas, R. E. (2010). Predicting relationship and life satisfaction from personality in nationally representative samples from three countries: The relative importance of actor, partner, and similarity effects. *Journal of Personality and Social Psychology, 99,* 690-702.

Feingold, A. (1992). Gender differences in mate selection preferences: A test of the parental investment model. *Psychological Bulletin, 112,* 125-139.

Finkel, E. J. & Eastwick, P. W. (2009). Arbitrary social norms influence sex differences in romantic selectivity. *Psychological Science, 20,* 1290-1295.

Finkel, E. J., Eastwick, P. W., & Matthews, J. (2007). Speed dating as an invaluable tool for studying romantic attraction: A methodological primer. *Personal Relationships, 14,* 149-166.

Frederick, D. A. & Haselton, M. G. (2007). Why is muscularity sexy? Tests of the fitness indicator hypothesis. *Personality and Social Psychology Bulletin, 33,* 1167-1183.

Friedman, J. N. W., Oltmanns, T. F., & Turkheimer, E. (2007). Interpersonal perception and personality disorders: Utilization of a thin slice approach. *Journal of Research in Personality, 41,* 667-688.

Furnham, A., Swami, V., & Shah, K. (2006). Body weight, waist-to-hip ratio and breast size correlates of ratings of attractiveness and health. *Personality and Individual Differences, 41,* 443-454.

Gangestad, S. W., & Thornhill, R. (1998). Menstrual cycle variation in women's preference for the scent of symmetrical men. *Proceedings of the Royal Society of London B, 262*, 727–733.

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.

Gangestad, S. W., Simpson, J. A., Cousins, A. J., Garver-Apgar, C. E., & Christensen, P. N. (2004). Women's preferences for male behavioral displays change across the menstrual cycle. *Psychological Science, 15,* 203-207.

Gangestad, S. W., Thornhill, R., & Garver, C. E. (2002). Changes in women's sexual interests and their partners' mate retention tactics across the menstrual cycle: Evidence for shifting conflicts of interest. *Proceedings of the Royal Society of London B, 269,* 975–982.

Greilin, H., & Buss, D. (2000). Women's sexual strategies: The hidden dimension of extra-pair mating. *Personality and Individual Differences, 28,* 929-963.

Harris, C. R. (2010). Menstrual cycle and facial preferences reconsidered. *Sex Roles, 64,* 669-681.

Haselton, M. G., & Buss, D. M. (2000). Error management theory: A new perspective on biases in cross-sex mind reading. *Journal of Personality and Social Psychology, 78,* 81-91.

Honekopp, J., Rudolph, U., Beier, L., Liebert, A., & Muller, C. (2007). Physical attractiveness of face and body as indicators of physical fitness in men. *Evolution and Human Behavior, 28,* 106-111.

Houser, M. L., Horan, S. M., & Furler, L. A. (2007). Predicting relational outcomes: An investigation of thin slice judgments in speed-dating. *Human Communication, 10,* 69-81.

Humbad, M. N., Donnellan, M. B., Iacono, W. G., & Burth, S. A. (2010). Externalizing psychopathology and marital adjustment in long-term marriages: Results from a large combined sample of married couples. *Journal of Abnormal Psychology, 119,* 151-162.

Jasienska, G., Ziomkiewicz, A., Ellison, P. T., Lipson, S. F., & Thune, I. (2004). Large breasts and narrow waists indicate high reproductive potential in women. *Proceedings of the Royal Society of London, Series B, 271,* 1213-1217.

Johnson, J. A. (2000). *Developing a short form of the IPIP-NEO: A report to HGW Consulting.* Unpublished manuscript. Department of Psychology, University of Pennsylvania, DuBois, PA.

Jones, D. (1996) *Physical Attractiveness and the Theory of Sexual Selection: Results From Five Populations.* Museum of Anthropology, University of Michigan.

Kenny, D. A. (1998). BLOCKO [computer program]. Available: http://nw3.nai.net/~dakenny/kenny.htm.

Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic Data Analysis*. Guilford Press.

Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallam, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin, 126,* 390-423.

Little, A. C. & Perrett, D. I. (2007). Using composite images to assess accuracy in personality attribution to faces. *British Journal of Psychology, 98,* 111-126.

Marcus, D. K. & Lehman, S. J. (2002). Are there sex differences in interpersonal perception at zero acquaintance? A social relations analysis. *Journal of Research in Personality, 36,* 190-207.

Miller, J. D., Lynam, D., & Leukefeld, C. (2003). Examining antisocial behavior through the lens of the Five Factor Model of personality. *Aggressive Behavior, 29,* 497-514.

Oltmanns, T. F., Friedman, J. N. W., Fiedler, E. R., & Turkheimer, E. (2004). Perceptions of people with personality disorders based on thin slices of behavior. *Journal of Research in Personality, 38,* 216-229.

Penton-Voak, I. S., & Perrett, D. I. (2000). Female preference for male faces changes cyclically—Further evidence. *Evolution and Human Behavior, 21,* 39–48.

Penton-Voak, I. S., Perrett, D. I., Castles, D., Burt, M., Koyabashi, T., & Murray, L. K. (1999). Female preference for male faces changes cyclically, *Nature, 399,* 741–742.

Peters, M., Rhodes, G., & Simmons, L. W. (2008). Does attractiveness in men provide clues to semen quality? *Journal of Evolutionary Biology, 21,* 572-579.

Peters, M., Simmons, L. W., & Rhodes, G. (2009). Preferences across the menstrual cycle for masculinity and symmetry in photographs of male faces and bodies. *PloS ONE, 4,* 1-7.

Pi-Sunyer, F. (1991). Health implications of obesity. *American Journal of Clinical Nutrition, 53,* 15955-16035.

Porter, S. & ten Brinke, L. (2008). Reading between the lies: Identifying concealed and falsified emotions in universal facial expressions. *Psychological Science, 19,* 508-514.

Porter, S., England, L., Juodis, M., ten Brinke, L., & Wilson, K. (2008). Is the face a window to the soul? Investigation of the accuracy of intuitive judgments of the trustworthiness of human faces. *Canadian Journal of Behavioural Science, 40,* 171-177.

Schmalt, H. (2006). Waist-to-hip ratio and female physical attractiveness: The moderating role of power motivation and the mating context. *Personality and Individual Differences, 41,* 455-465.

Schmitt, D. P. (2008). An evolutionary perspective on mate choice and relationship initiation. In S. Sprecher, A. Wenzel, & J. Harvey (Eds.), *Handbook of Relationship Initiation* (pp. 55-74). New York, NY: Taylor & Francis Group.

Shackelford, T. K., & Larsen, R. J. (1999). Facial attractiveness and physical health. *Evolution and Human Behavior, 20,* 71–76.

Shackelford, T. K., Schmitt, D. P., & Buss, D. M. (2005). Universal dimensions of human mate preferences. *Personality and Individual Differences, 39,* 447-458.

Sherman, R. A., & Funder, D. C. (2009). Evaluating correlations in studies of personality and behavior: Beyond the number of significant findings to be expected by chance. *Journal of Research in Personality, 43,* 1053-1063.

Singh, D. & Randall, P. K. (2007). Beauty is in the eye of the plastic surgeon: Waist-hip ratio (WHR) and women's attractiveness. *Personality and Individual Differences, 43,* 329-340.

Singh, D. (1993). Adaptive significance of female physical attractiveness: Role of waist-to-hip ratio. *Journal of Personality and Social Psychology, 65,* 292–307.

Singh, D. (1994). Ideal female body shape: Role of body weight and waist-to-hip ratio. *International Journal of Eating Disorders, 16,* 283–288.

Singh, D. (1995). Female judgment of male attractiveness for relationships: Role of waist-to-hip ratio and financial status. *Journal of Personality and Social Psychology, 69,* 1089–1101.

Soler, C., Nunez, M., Gutierrez, R., Nunez, J., Medina, P., Sanchoa, M., Alvarez, J., & Nunez, A. (2003). Facial attractiveness in men provides clues to semen quality. *Evolution and Human Behavior, 24,* 199-207.

Sutin, A. R., Costa, Jr., P. T., Miech, R., & Eaton, W. W. (2009). Personality and career success: Concurrent and longitudinal relations. *European Journal of Personality, 23,* 71-84.

Swami, V., Greven, C., & Furnham, A. (2007). More than just skin-deep? A pilot study integrating physical and non-physical factors in the perception of physical attractiveness. *Personality and Individual Differences, 42,* 563-572.

Thornhill, R. & Gangestad, S. W. (2006). Facial sexual dimorphism, developmental stability, and susceptibility to disease in men and women. *Evolution and Human Behavior, 27,* 131-144.

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

Van Itallie, T. B. (1985). Health implications of overweight and obesity in the United States. *Annals of Internal Medicine, 103,* 983-988.

Wiggins, J. S. (1991). Agency and communion as conceptual coordinates for the understanding and measurement of interpersonal behavior. In P. E. Meehl, D. Cicchetti, & William M. Grove (Eds.), *Thinking Clearly about Psychology: Personality and Psychopathology* (pp. 89-113). Minneapolis: University of Minnesota Press.

Wilcox, A. J., Dunson, D. B., Weinberg, C. R., Trussell, J., & Baird, D. D. (2001). Likelihood of conception with a single act of intercourse: Providing benchmark rates for assessment of post-coital contraceptives. *Contraception, 63,* 211-215.

Willis, J., & Todorov, A. (2006). First impressions: Making up your mind after a 100–ms exposure to a face. *Psychological Science, 17,* 592–598.

Wilson, J. M. B., Tripp, D. A., & Boland, F. J. (2005). The relative contributions of waist-to-hip ratio and body mass index to judgements of attractiveness. *Sexualities, Evolution & Gender, 7,* 245-267.

Zebrowitz, L. A. & Rhodes, G. (2004). Sensitivity to "bad genes" and the anomalous face overgeneralization effect: Cue validity, cue utilization, and accuracy in judging intelligence and health. *Journal of Nonverbal Behavior, 28,* 167-185.