Do Birds of a Playful Feather Flock Together?

Playfulness and Assortative Mating

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The authors discuss assortative mating, the tendency—important for increased genetic variation—of individuals to mate with the phenotypically similar at rates greater than chance. Influenced by many factors—physical characteristics like height and weight and demographic elements like behavior and attitudes, economic status and education, church attendance and ethnic identity, politics and personality—assortative mating has been considered with regard to having a good sense of humor but never to being playful or being fun loving. Based on a study of 254 undergraduates, the authors examine how these variables correlate with the search for desirable mates by adults and suggest the variables are indeed subject to assortative mating. **Key words**: assortative mating, fun loving, mate choice, playfulness, sense of humor, social homogamy

One saying goes "birds of a feather flock together." In contrast, another holds "opposites attract." When it comes to selecting mates—as numerous studies have shown—humans appear to favor the first old saw over the second. That is to say, their mated pairs frequently share physical attributes, behavioral mannerisms, and psychological traits (e.g., Baniel 2018; Luo 2017). Given the broad array of characteristics sought by individuals in prospective mates, playfulness and seemingly related traits—such as having a good sense of humor and being fun loving—may be qualities that prospective partners seek in each other. If so, playfulness may be subject to assortative mating, the tendency of individuals across animal species, including humans, to mate with others who share phenotypic or genotypic characteristics at frequencies we would not anticipate if such pairings were random (Jiang, Bolnick, and Kirkpatrick 2013; Robinson et al. 2017). Because a good sense of humor has been so frequently identified as a characteristic sought in prospective mates, the goals of our study are to replicate earlier findings with respect to sense of humor and to determine if

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presumably related traits—being playful and fun loving—are also subject to assortative mating.

Assortative Mating

In 1886 Francis Galton wrote "men and women of contrasted heights, short and tall or tall and short, married just about as frequently as men and women of similar height, both tall or both short" thus indicating that height is "little entangled with considerations of nurture, of the survival of the fittest, or of marriage selection" (251). Galton's observation appears to have been premature, however. In 1903 Karl Pearson and Alice Lee, using Galton's data, found correlations between the heights of husbands and wives of $r = .28$ and approximately $r = .20$ for arm span and forearm length (although conceding that these might be due to stature). Soon after, in 1908, George Hardy, a British mathematician, and Wilhelm Weinberg, a German physician, independently developed the principle of genetic equilibrium, showing that allele [one of two or more variants of a gene—eds.] and, therefore, genotype frequencies remain constant with random mating in indefinitely large populations. Specifically, Hardy (1908) disputed the commonly held view that dominant alleles would tend to increase in frequency at the expense of recessive alleles while Weinberg (1908) derived a general equilibrium model for a single gene with two alleles. The Hardy-Weinberg principle, or Hardy-Weinberg Equilibrium, holds that two alleles, designated A and a which occur with frequencies p and q, will, with random mating, generate genotype frequencies of p^2, $2pq$, and q^2. Hence, if $p = .7$ and $q = .3$, $AA = p^2$ or .49, $Aa = 2pq$ or .21, and $aA = q^2$ or .09. Assortative mating does not result in the gain or loss of alleles, but it does affect genotype frequencies by reconfiguring them in individuals and can lead to differences in allele frequency in population subgroups. Because divergences from random mating disturb the distribution of genotypes in a population, evolutionary agents, such as artificial or natural selection (including sexual selection), can then lead to evolutionary change (Crow and Felsenstein 1968). The Hardy-Weinberg principle, along with Mendel's laws, is a cornerstone of population genetics.

Assortative mating can be positive (the tendency for mating among individuals who are phenotypically or genotypically similar) or negative (where mating is more common among individuals who are phenotypically or genotypically dissimilar) (Hooper and Miller 2008). The latter is also referred to

as disassortative mating. Positive assortative mating outside nuclear families leads to increased genetic similarity (homozygosity) within families (Guo et al. 2014; Jiang, Bolnick, and Kirkpatrick 2013). Although this can enhance fitness if it leads to traits that result in individuals being better able to produce more, or more viable, offspring, it can also give rise to inbreeding. Inbreeding may lead to an accumulation of deleterious recessive alleles that then result in autosomal recessive disorders. Moreover, mates who share genetic traits related to characteristics such as obesity or psychiatric conditions can compound the impact of these characteristics in their offspring (Guo et al. 2014). On the other hand, negative, or disassortative, mating increases heterozygosity within groups, thereby decreasing the possible ill effects of inbreeding.

In humans, assortative mating is overwhelmingly positive (Jiang, Bolnick, and Kirkpatrick 2013; Robinson et al. 2017; Watson, Beer, and McDade-Montez 2014) and occurs with respect to a variety of physical, behavioral, personal, and social attributes. These include height, weight, age, skin pigmentation, physical attractiveness, educational attainment, cognitive ability, socioeconomic status, racial and ethnic identification, attitudes, values, and even certain psychiatric disorders (e.g., Feingold 1988; Guo et al. 2014; Le Bon et al. 2013; Pearson 1903; Nordsletten et al. 2016; Watson et al. 2004). Assortative mating in humans is relatively weak for personality traits (i.e., spousal correlations between $r = .10$ and .25) but stronger for attitudes (i.e., spousal correlation range $r = .25$ - .65) (Kandler, Bleidorn, and Riemann 2012). Watson and his associates (2004) found substantial similarity between spouses for religiousness ($r = .75$) and political conservatism ($r = .63$), for example.

Evidence that patterns of assortative mating with respect to particular traits can change over time, and some personality traits may converge gradually during long-term partnerships is equivocal. For example, Yang and her colleagues (2015) compared a sample of 3,459 Korean adults from 687 families using the Temperament and Character Inventory (TCI) (Cloninger et al. 1994), an instrument based on a biosocial model of personality that includes two factors, temperament and character. Temperament reflects behavioral traits primarily based in genetics or neurophysiological features, including novelty seeking (NS), harm avoidance (HA), reward dependence (RD), and persistence (PE). Character traits, on the other hand, presumably develop primarily due to one's sociocultural environment and include self-directedness (SD), cooperativeness (CO), and self-transcendence (ST). Except for PE, these are divided into three to five subdimensions (Cloninger 1986; Cloninger et al. 1994). Yang and her colleagues

(2015) found that spouses did not share temperament traits but were more similar to each other (intraclass correlations = .27 – .38) than to first-degree relatives (intraclass correlations = .10 – .29) for character dimensions. Moreover, the degree to which spouses resembled each other in terms of most character traits increased with marriage duration. Using the TCI with 145 Belgian male-female couples, Le Bon and his associates (2013) found significant positive associations between partners in terms of NS, RD, PS, and CO with intraclass correlations ranging between .25 (PS) and .43 (CO). Correlations between SD and ST, although positive, were not statistically significant. No associations were found for HA or its subdimensions and, unlike Yang and her colleagues (2015), they did not find that the magnitude of the difference between partners changed with partnership duration. Zietsch and his associates (2011) held that initial choices influence partner similarity, not convergence over time. These results, along with others (e.g., Gonzaga, Campos, and Bradbury 2010; Wortman and Lucas 2016) led Luo (2017) to conclude that the preponderance of evidence supports the idea that "shared life experiences and circumstances play a significant role in maintaining rather than increasing couples' initial similarity" (7).

Social homogamy is a form of assortative mating that denotes correlations between mates based on socially or culturally significant markers of group membership, such as ethnicity, religion, socioeconomic status, education level, caste, kinship, and social class (Horwitz et al. 2016; Robinson et al. 2017; Sherlock et al. 2017). Individuals are also more likely to affiliate with others simply because of shared life experiences and physical proximity. For example, people who enjoy dancing are more likely to meet others who have similar interests, attitudes, and values because they attend more dance venues. Individuals may meet at school, in church, in the workplace, or in the neighborhood. This contrasts with active assortment, where individuals seek mates who resemble themselves with respect to some particular characteristic or characteristics. In contrast, social homogamy involves indirect or passive influences on the similarity of mates (Watson et al. 2004).

The degree to which assortative mating is influenced by genetics or social and environmental factors is largely unresolved. Based on a sample of more than twenty-seven thousand individuals, Zietsch and his colleagues (2011) examined the degrees to which fourteen characteristics of identical twins, including body mass index, age, height, education level, income, social attitudes, personality traits, and religiosity, matched those of their partners compared to fraternal twins. They found that the partners of identical twins were no more similar to

each other than were the partners of nonidentical twins, thus suggesting little or no genetic influence on partner selection. However, Zietsch and his associates (2011) investigated only the similarity in partners, not the similarity between twins themselves and their partners. Sherlock and his colleagues (2017) investigated the latter issue with the same sample of twins and their partners based on "measures of height, body mass index (BMI), personality traits, social attitudes, religiosity, education, income, and age" (26). They found partner correlations of $r = .14$ for BMI, $r = .20$ for height, $r = .48$ for education, $r = .17$ for income, $r = .74$ for religiosity, $r = .67$ for attitudes, and $r = .96$ for age but only $r = .04$ for extraversion and $r = .09$ for novelty seeking.

Horwitz and her associates (2016) studied pair-bonding behavior, defined as the "attachment, trust, closeness, ad parental investment" (143) between mates, finding that "couple similarity for pair-bonding behavior was accounted for by direct phenotypic assortment, free from the effects of social homogamy" (147) and did not vary by gender. They concluded, "couple similarity for pair-bonding behavior is a consequence of individuals actively selecting mates with similar genetically based characteristics, rather than the couples' shared social background factors" (147). Robinson and his colleagues (2017) also found evidence for direct assortative mating across three large samples (a total of 24,662 spousal pairs) with respect to height ($r = .20$). They reported that secondary assortment on genetically correlated traits probably accounts for the relationship ($r = .65$) at trait-associated genetic loci for educational attainment. Finally, with respect to BMI ($r = .14$), waist-to-hip ratio ($r = .10$), and systolic blood pressure ($r = .14$), they suggested that phenotypic similarity between partners could be due to indirect assortment on a genetically correlated metabolic trait or to some combination of direct assortment and environmental sharing. On the other hand, Sherlock and his associates (2017) found "no significant independent influence of genes or the shared environment" (33) on variation in partner self-similarity across the various traits. Given that Sherlock and his colleagues determined that more than 90 percent of the variance in partner self-similarity was due to residual sources of variation, they argued that assortative mating may be driven most strongly by propinquity—similar individuals are found in similar environments where interaction is more likely and pairing therefore more probable.

Most studies of human assortative mating have focused on residents of industrial nations. However, Godoy and his colleagues (2008) showed that the Tsimané, a farming-foraging society of the Bolivian Amazon, practice assortative

mating, exhibiting positive correlations for height, age, schooling, and earnings that resemble those from industrial nations. Moreover, with respect to knowledge of wild edible plants, the correlation between mated couples was much higher (r = .63) than for random pairings (r = .05). Bailey and his associates. (2013) found assortative mating among the Ache of eastern Paraguay associated with the "Big Five" personality dimensions, including conscientiousness (r = .41) and openness to experience (r = .43) in thirty-three male-female pairs. These correlations are larger than typically found in Western couples but similar to those found for extraversion (r = .39) by Alvergne, Jokela, and Lummaa (2010) in a high fertility polygynous society in rural Senegal. Hence, similar patterns of assortative mating occur cross-culturally, suggesting a substantial genetic component.

The tendency to affiliate with others who are similar, whether in terms of attitudes, values, activity preferences, personality, or physical attractiveness, whether with respect to marriage, mating, friendship, or just being acquainted, may, therefore, involve genetic and environmental factors (Robinson et al. 2017). And, as Robinson and his colleagues indicate, "The causes and genetic consequences of assortative mating remain unresolved because partner similarity can arise from different mechanisms: phenotypic assortment based on mate choice, partner interaction and convergence in phenotype over time, or social homogamy where individuals pair according to social or environmental background" (1). Hence, while the mechanisms that drive assortative mating remain unresolved, its existence is uncontroversial.

Sexual Selection, Assortative Mating, and the Handicap Principle

Darwin (1859) proposed two types of sexual selection: competition and choice. Competition, also known as intrasexual selection, occurs between members of the same sex. Competitors engage in contests that sometimes include physical combat but that may also involve the possession of critical resources (such as food or breeding sites) to gather and guard members of the other sex, thus attempting to ensure complete sexual access to them. Intrasexual selection is most often ascribed to males but is common among females, as well. Anyone who has attended high school should be well aware that both males and females compete for prospective mates.

Choice, or intersexual selection, on the other hand, occurs between the sexes and is most often, but not exclusively, the province of females. Among many species of birds, such as the North American cardinal or the peacock of

Asia and Africa, males are adorned with bright and elaborate plumage that seems maladaptive in the sense that it could make them more obvious to predators or hinder escape from them. To explain this, Darwin wrote, "I can see no good reason to doubt that female birds, by selecting during thousands of generations, the most melodious or beautiful males, according to their standard of beauty, might produce a marked effect" (66). However, Darwin never indicated why female birds, or members of other species, should have such apparently arbitrary standards of beauty.

Such choices are now usually explained by direct and indirect benefit models (Jones and Ratterman 2009). A direct benefit occurs when an individual (usually female) chooses a mate (usually male) that can provide an immediate benefit to the chooser. This may involve a nest, territory, parental care, or a gift, such as food. In the indirect benefit model, the chosen mate, again usually male, may be ornamented, either physically or behaviorally, but apparently does not provide any type of immediate benefit to the chooser, usually a female. This situation is generally thought to reflect Amos Zahavi's (1975) "handicap principle" where the benefit accorded to the chooser consists of the otherwise unobserved genetic superiority of the chosen.

Zahavi (1975) proposed the handicap principle to explain the presence of physical ornaments or behaviors that, otherwise, appear to be evolutionarily disadvantageous, such as bright colors, elaborate vocalizations, or courtship rituals (e.g., the elaborate tail feathers of peacocks, vocalizations among various birds, frogs, and other animals, courtship dances among birds of paradise or greater sage grouse). Zahavi (1975; Zahavi and Zahavi 1997) held that for signals (of an individual's fitness) to be reliable, they must be genuinely costly to the signaler. Otherwise, less fit individuals could deceive potential mates with similar displays. Hence, fitter animals signal potential mates of their fitness through self-handicapping morphological or behavioral displays. The displays presumably communicate that fitter individuals are more likely to thrive, despite the handicaps, than the less fit and will confer their fitness on their offspring.

Mutual Mate Choice

Research since Darwin's introduction of the concept of sexual selection has most often focused on sexually dimorphic ornaments and behaviors, usually exhibited by males and selected by females. However, in many species, members of both sexes display elaborate ornaments and courtship behaviors, and both exhibit choosiness with respect to prospective mates. Mutual mate choice appears to be

particularly true of humans as both males and females advertise their qualities via hairstyles, cosmetics, clothing, other material accouterments (e.g., jewelry, cars), and behaviors. Conspicuous expenditures by individuals show that they can absorb substantial resource costs, presumably without significant sacrifice, while others, such as wearing flattering clothing and using makeup that enhances symmetry and youthful appearance, advertise qualities as a prospective mate and may enhance mating opportunities for both males and females (Gallup and Frederick 2010; Nelissen and Meijers 2010; Sundie et al. 2011). Because being playful, having a good sense of humor, and being fun loving appear to be qualities sought by prospective mates, both males and females (Chick et al. 2012; Proyer and Wagner 2015), they seem traits driven by mutual mate choice.

Assortative Mating and the Costs of Play

Play is often held to have immediate benefits, particularly for juveniles. These include somatic benefits, such as neuromuscular development, the inculcation of species-typical behaviors used later in life, and the practice of more general physical, social, and emotional skills that may be useful in situations encountered as adults (Burghardt 2005; Graham and Burghardt 2010; Fagen 1981; Held and Špinka 2011; Pellis and Pellis 2009). However, some elements of play do not appear to resemble any adult behavior patterns, and play often precedes, accompanies, or follows appropriate behavior patterns (Graham and Burghardt 2010; Held and Špinka 2011). Hence, play may have both immediate and long-term benefits (Burghardt 2005; Graham and Burghardt 2010; Held and Špinka 2011). If play has delayed benefits, does engaging in play or having a strong propensity to play therefore somehow indicate a handicap or, specifically, a costly signal of mate quality? The costs of play among juvenile animals, in particular, are often cited and typically include the expenditure of time and energy during play, the risk of injury, and the exposure to predation (e.g., Caro 1995; Fagen 1981; Graham and Burghardt 2010; Kuehl et al. 2008). Evolutionary forces must overcome such costs for play to persist. Bird and Smith (2005) indicate that a signal must meet four criteria to be costly. It must be easily observed, difficult to fake, associated with a desirable (though itself unobservable) quality, and able to provide a benefit to fitness. These criteria apply most obviously to physical ornamentation, such as the flamboyant tail of the peacock, but are relevant to behavioral repertoires, as well. Being playful, having a good sense of humor, and being fun loving are, in general, easy to observe and difficult to fake, and if associated with desirable qualities, they should provide fitness benefits to both sexes.

Are being playful, having a good sense of humor, and being fun loving therefore costly signals that reliably indicate heritable, and positive, genetic qualities in both adult human males and females? Zahavi (1975) indicated that signals must be genuinely costly to be reliable, but how might play be costly? This question has been largely answered for juvenile animals that, as noted above, waste time and energy and risk injury and predation in play. Human adults also spend time and energy in play that might be directed at more productive ends and those who engage in extreme sports such as free solo climbing, BASE jumping, or motorcycle racing, even risk of injury or death. However, although most adult human play, such as parent-child play, play with pets, games, nonextreme sports, hobbies, joking, and so on, is mostly benign, it does take time and energy that could be spent in more productive pursuits.

Consider an anthropological example of how play can be adjusted to control its cost. In their study of time allocation among four societies native to the Brazilian Amazon, Rubin, Flowers, and Gross (1986) found that, although all four groups live in similar habitats, the forest biomass and soil nutrient levels are lower in the Kanela and Bororo territories than in those where the Xavante and Mekranoti live. They showed that the groups adapted to their ecological circumstances not through varying their productive efforts but by modifying their caloric needs. The Kanela and Bororo, living in less productive habitats, did so by spending more time in low energy play and leisure, such as resting or sleeping, rather than high energy activities, such as wrestling or dancing. This was especially true for children under the age of fifteen and somewhat more so for girls than boys. While all children devoted more time to active play than adults, Kanela children spent more than twice as much time resting and sleeping than in active play. Bororo children were not as extreme but still spent more time in rest than play. In contrast, Xavante and Mekranoti children spent about 60 percent of their nonproductive time in active play rather than passive activities. The authors concluded that, although the two groups living in degraded areas could have adapted by spending more time in productive efforts, they chose instead to reduce their caloric needs in the contexts of play and leisure, areas of relatively high cost with little obvious return.

Assortative Mating for Good Sense of Humor

Although more research must be devoted to adult play and its costs more generally, sense of humor (a variable often associated with play and playfulness) has received substantial attention with respect to assortative mating. Numerous

studies have supported the idea that a good sense of humor is a trait preferred by both men and women worldwide (e.g., Todosijevic, Snezana, and Arancic 2003; Toro-Morn and Sprecher 2003; Weisfeld et al. 2011). Miller (2000) proposed that a good sense of humor is a sexually selected honest signal of genetic quality as it requires otherwise useful cognitive skills, such as intelligence and creativity, for its production. Bressler and his associates (2006), Kaufman and his colleagues (2008), and Wilbur and Campbell (2011), for example, found evidence that females prefer males who produce humor while males prefer females who are receptive to and appreciate their humor. In a partial replication of this and related research on sex differences in preferences for a good sense of humor in prospective mates, Hone, Hurwitz, and Lieberman (2015) found that "men viewed humor receptivity as a necessity and humor production as a luxury when they were asked to create an ideal long-term partner" (167). In contrast, women reported precisely the opposite. Hence, while prospective mates, both male and female, seek partners who have a good sense of humor, a case of mutual mate preference, it may be that the exact meaning of "sense of humor" varies by gender. Chick (1998, 2001) proposed a somewhat similar scenario for why both men and women might prefer playful partners in his signal theory of adult play. Although play and playfulness may have a role in mutual mate preference, the message they send to prospective partners might differ by sex.

The Signal Theory of Adult Play

In an address to the 1998 meeting of The Association for the Study of Play, Chick proposed a "signal theory" of adult play. He suggested that adult playfulness might be, at least in part, a signal to current or prospective mates that the signaler is, or will be, a good partner. Specifically, he hypothesized that females should prefer playful males as playfulness in men may signal nonaggressiveness toward females and their offspring. Males, on the other hand, should prefer playful females as playfulness signals their youthfulness and, therefore, fecundity. Therefore, both males and females should prefer playful mates although for different reasons.

In a test of the mutual mate preference aspect of the signal theory of adult play, Chick, Yarnal, and Purrington (2012) asked a sample of undergraduate students ($N = 254$) to rate thirty-five traits on a ten-item scale from "not at all desirable" to "extremely desirable" in possible long-term mates. Thirteen of these

traits were from a list developed by Buss and Barnes (1986) based on a factor analysis of the seventy-six traits found in a marital preferences questionnaire (Gough, 1973). The analysis resulted in nine factors from which Buss and Barnes (1986) selected the item with the highest factor loading. They also retained several additional items, including "intelligent" and "creative" because of their "conceptual distinctiveness" (567) despite the fact that both fell under the same factor heading. They retained "good earning capacity" and "physically attractive," as well, because these exhibited large gender differences. Finally, they included "good heredity" because relevant literature suggested its importance. The resulting thirteen-item scale, termed the Mate Preference Scale (MPS) by Kamble and his colleagues (2014), has been used in at least a dozen additional studies, in either original or slightly modified form, following its publication by Buss and Barnes in 1986 (Buss and Angleitner 1989; Buss et al. 1990; Chang et al. 2011; Chick, Yarnal, and Purrington 2012; Conroy-Beam and Buss 2016; Gignac et al. 2018; Gignac and Starbuck 2019; Goodwin and Tinker 2002; Kamble et al. 2014; Perilloux, Fleischman, and Buss 2011; Proyer and Wagner 2015; Zietsch, Verweij, and Burri 2012). Chick, Yarnal, and Purrington (2012) modified the MPS by adding "playful," "good sense of humor," and "fun loving." The remaining nineteen of the thirty-five items were selected primarily from the marital preferences questionnaire but also included items based on the authors' interests, such as "achievement oriented" and "athletic." These additional items were not included in the Chick, Yarnal, and Purrington study and will not be examined here. The additional items did, however, affect instrument design because respondents were asked to rate items on ten-point Likert-type scales rather than rank order them, as has been the case in most other studies using the thirteen-item MPS. Chick, Yarnal, Purrington (2012) felt it would have been cognitively difficult for respondents to rank thirty-five traits reliably.

Chick, Yarnal, and Purrington hypothesized simply that "playful," "good sense of humor," and "fun loving" would be ranked in the top half of the sixteen traits they retained. They found that "playful" was rated fifth highest among the traits, fourth by females in terms of what they preferred in males, and fifth by males in terms of what they preferred in females. "Good sense of humor" was ranked first overall, second by females in terms of what they sought in males, and first by males in terms of what they preferred in females. Finally, "fun loving" was rated third overall and by both males and females. Hence, Chick, Yarnal, and Purrington's hypothesis was supported.

Proyer and Wagner (2015) replicated Chick, Yarnal, and Purrington's study

with a German-speaking sample of 327 students (seventy-nine men and 248 women) using a German version of the MPS, along with the three items added by Chick, Yarnal, and Purrington, plus the Short Measure of Adult Playfulness (SMAP) (Proyer 2012a). The latter consists of five items, such as "I am a playful person," that provide a unidimensional measure of adult playfulness. Responses are on seven-point Likert-type items ranging from "strongly disagree" to "strongly agree." Proyer and Wagner's findings with respect to trait preferences were similar to those of Chick, Yarnal, and Purrington and led the former to conclude, "the findings obtained from a U.S. sample can be closely replicated by data collected in German-speaking countries" (208). Proyer and Wagner also found, after dividing individuals into two groups on the basis of their SMAP scores, that those who self-rated as higher in playfulness also gave higher scores for mate preferences in "playful," "good sense of humor," "fun loving," "easygoing," "creative," "exciting personality," "intelligent," and "wants children" than individuals who scored in the bottom half of the sample in terms of self-rated playfulness. Finally, 38 percent of Proyer and Wagner's sample were in a relationship at the time they participated in the study. They tested whether those in a relationship differed in playfulness from those not in a relationship, hypothesizing that the former would exhibit higher levels of playfulness and found support for this hypothesis as well.

Based on the data gathered by Chick, Yarnal, and Purrington (2012), Chick (2013) reported no differences between males and females in terms of their preferences for mates being playful, having a good sense of humor, or being fun loving. The researchers also collected self-ratings on the sixteen traits, and Chick found that females regarded themselves as having a slightly better sense of humor than males. The genders did not differ in terms of their self-reported level of being playful or fun loving. Chick reported that both males and females expressed preference for long-term partners who were higher in both being playful and being fun loving than they claimed to be themselves. Males also indicated preference for females who had a better sense of humor than their own, but this was not the case for females.

Proyer and his colleagues (2017) found evidence consistent with assortative mating with respect to several facets of playfulness as measured by a twenty-eight–item scale that assesses four facets of adult playfulness, namely "other-directed," "lighthearted," "intellectual," and "whimsical" (OLIW), as well as a global measure of adult playfulness (the SMAP). Correlations between seventy-seven heterosexual romantic partners for other-directed ($r = .42$), whimsical ($r =$

.47), intellectual (r = .16), and global playfulness (r = .22; SMAP) were positive and significant although that for lighthearted playfulness was not (r = -.10).

Playfulness, Good Sense of Humor, and Being Fun Loving as Personality Traits

Chick (1998, 2001) assumed that being playful, having a good sense of humor, and being fun loving, while typically expressed in some situations and not others, are relatively stable characteristics of individuals. But, can individuals expect these traits to endure in prospective mates over the long term? Individual human and nonhuman animals differ in their behavior and when these differences are determined to be consistent, the actors are said to have a "personality." The concept of personality implies two qualities: the repeatability of behavior across time and contexts and the idea that the expression of certain behaviors correlates with the expression of others (Beekman and Jordan 2017). Among humans, personality traits are "dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings, and actions" (McCrae and Costa 1990, 23) and presumed relatively stable across time and context. Although playfulness has occasionally been conceptualized as a kind of state of being, it is most often viewed as a relatively stable trait that ranges from low to high (e.g., Shen, Chick, and Zinn 2014). Models of playfulness can be separated into those that consider it a single dimension and those that distinguish among its distinct components (Proyer, Tandler, and Brauer 2019).

The treatment of playfulness as an enduring personality trait dates at least to Murray's (1938) notion of a need for play, grew during the 1960s (e.g., Lieberman 1965, 1966; Millar 1968), and was subsequently established in psychologically oriented play research (e.g., Barnett 1990, 1991a, 1991b, 2007, 2011; Bundy 1993, 1997; Glynn and Webster 1992; Shen et al. 2014; Proyer 2012a, 2012b, 2017; Proyer and Ruch 2011; Proyer and Wagner 2015; Yue, Leung, and Hiranandani 2016). Early research on play and playfulness focused largely on children (Barnett 1990, 1991a, 1991b; Bundy 1997) and held playfulness to be an attribute of a child's personality (e.g., Berlyne 1969; Singer and Rummo 1973; Singer, Singer, and Sherrod 1980). Lieberman (1966), for example, claimed that "playfulness survives the play situation and becomes a personality trait at later age levels" (127), and she later extended her research to adolescents and adults (Lieberman 1977). Singer and Rummo (1973) and Singer, Singer, and Sherrod (1980) provided early empirical support for playfulness as a personality characteristic in children.

The study of adult play and playfulness appears to have been largely neglected until the early 1990s when instruments to measure playfulness in adults were introduced by Glynn and Webster (1992) and later by Schaefer and Greenberg (1997) and O'Connell and her colleagues (2000). Recent adult playfulness researchers (e.g., Barnett, 2011; Magnuson and Barnett 2013; Proyer 2017; Shen et al. 2014) have conceptualized it as a personality trait that exhibits relative stability over time, both in western and nonwestern areas of the world (e.g., Yu et al. 2007). Given these considerations, Proyer (2017) defined adult playfulness as "an individual differences variable that allows people to frame or reframe everyday situations in a way such that they experience them as entertaining, and/or intellectually stimulating, and/or personally interesting" (114). With respect to animals, more generally, Burghardt (2005) defined play as a "repeated, incompletely functional behavior differing from more serious versions structurally, contextually, or ontogenetically and initiated voluntarily when the animal is in a relaxed and low-stress setting" (82). One might define playfulness, in humans as well as other animals, as the differential propensity to engage in such behaviors.

McGhee (1979, 2010) regarded sense of humor to be a special case of playfulness, that is, as being playful with ideas, but Peterson and Seligman (2004) viewed playfulness and sense of humor to be synonymous in their classification of morally positively valued traits (character strengths). Proyer and Ruch (2011) found humor, as measured by the Values in Action Inventory Scale (VIA-IS) (Peterson, Park, and Seligman 2005), to be moderately correlated with overall playfulness ($r = .41$), as measured by the SMAP, as well as moderately correlated (i.e., $r = .29 – .49$) with aspects of playfulness, including spontaneity, expressiveness, creativity, fun, and silliness, as measured by Glynn and Webster's (1992) Adult Playfulness Scale. Proyer and Ruch (2011) therefore regarded playfulness and humor to be overlapping rather than identical concepts.

Hehl and Ruch (1985) sought to determine how sense of humor (as an individual differences variable that describes habitual levels of humor-related thoughts, feelings, and actions) relates to other personality traits and found that humor is related to temperament variables. Later research by Ruch and Carrell (1998) showed that trait cheerfulness accounted for the largest share of the variance in a sense of humor scale while seriousness and bad mood were also influential. Ruch and Köhler (1998) argued that that these concepts are the temperamental basis of a sense of humor and reported that they are better predictors of humor than broader concepts such as extraversion. Yip and Martin (2006)

found that positive humor styles and trait cheerfulness correlated positively with aspects of social competence while negative humor styles, such as aggressive teasing or sarcasm, correlated negatively with trait bad mood. According to Martin (2003), sense of humor is regarded as an enduring personality trait in contemporary psychology, although its definition and how to measure it are less certain. In a recent study, Heintz (2017) claimed at least seven dimensions are necessary to describe individual differences in daily patterns of humor and several of these overlap with Big Five personality traits. In sum, sense of humor is related to aspects of personality, such as extraversion, is regarded as a personality trait itself by many researchers, and appears to be relatively stable over time.

In a study of same- and opposite-sex friendship dyads among college students, Mahoney and Heretick (1979) found that males primarily rated females in terms of what the authors termed "carefree creativity," a factor that included concepts such as "imaginative," "venturesome," "bright," and "fun loving" (222). McCrae and Costa (1987) described highly extraverted individuals as "sociable, fun loving, affectionate, friendly, and talkative" (87), and Turner and her associates (2014) found they tend to be sociable and fun loving with respect to a five-factor model of personality. Mori and Tanabe (2015) found fun loving to be an important component in the extraversion dimension of a personality scale administered to students in Japan. McManus and Furnham (2010) asked informants to use adjectives from a checklist to describe a situation that had been fun for them. A factor analysis identified five types of fun, each of which correlated with the informants' demographic characteristics, personality characteristics, and attitudes toward fun. The strongest of these was between what the authors termed the "ecstatic" fun type and extraversion ($r = .25$) with the "sociability" fun type a close second, correlating with extraversion at $r = .19$. McManus and Furnham (2010) concluded that fun "can be seen as both an attribute of a person ('they are jolly good fun') or the property of an activity ('swimming is good fun')" and that "fun people it would appear are agreeable, open, extraverts" (166–67). Although we have not found fun loving described as a personality trait, per se, it is consistently included as an aspect of extraversion when described as part of the Big Five model of personality. In addition, Schaefer and Greenberg (1997) labeled one of five factors in their twenty-eight–item playfulness scale for adults "fun loving." Glynn and Webster (1992) designated one of five factors in their twenty-five–item Adult Playfulness Scale as "humorous and fun loving," and Shen, Chick, and Zen (2014) termed one of the three dimensions of their Adult Playfulness Trait Scale (APTS) "fun-seeking motivation." Thus,

substantial research suggests that being fun loving is a component of personality and is relatively enduring.

The Heritability of Playfulness, Having a Good Sense of Humor, and Being Fun Loving

As personality traits, to what degree are being playful, having a good sense of humor, and being fun loving inherited? Heritability of behavior here refers to "the proportion of a variation in an observed behavioral trait can be attributed to . . . genetic factors" (Kumar et al. 2017, 1). The alternative causal factor in explaining animal behavior is the environment, meaning anything to which an individual is exposed that could influence the expression of a trait (Kumar et al. 2017). Genes will likely have a greater effect for individuals who share a similar environment while, for those who have a common genotype, variation in behavior can be largely attributed to the environment. Hence, observed behavior comes from an interaction of factors rather than any one in isolation (Johnson 2007). In a study of more than four thousand twins, mostly female, using the MPS, Zietsch, Verweij, and Burri (2012) found "physical attractiveness the most heritable (29 percent) and housekeeping ability the least (5 percent)" (1762). Moreover, over the thirteen MPS traits combined, broad-sense heritabilities (i.e., the proportion of phenotypic variance due to genotypic variance) were highly significant in females (20 percent of the variation) but marginal in males (19 percent of the variation), probably due to the small sample size of the latter. Although providing no direct evidence regarding "playful," "good sense of humor," and "fun loving" as used by Chick, Yarnal, and Purrington (2012) and Proyer and Wagner (2015) in their modification of the MPS, their results at least permit the speculation that these items would exhibit heritabilities similar to the thirteen original MPS personal traits.

Substantial research has been directed at the heritability of playfulness in several nonhuman mammalian species. Walker and Byers (1991), for example, showed that the rate of play in two strains of house mice differed sufficiently for selection to act on the trait. Siviy and his colleagues (2003) determined that Fischer-344 laboratory rats were consistently less playful than Lewis rats in terms of either initiating or responding to playful solicitations. Strain differences were present regardless of prior social isolation, suggesting that the variance in playfulness is a relatively stable trait. Rats bred selectively to produce high rates of vocalization induced by tickling also solicit play more often than those bred for low vocalization rates (Webber et al. 2012). According to Siviy (2016), "Rats

bred for certain physiological and/or behavioral traits have also been shown to systematically differ in playfulness. . . . Taken together, these data suggest that the amount of playfulness exhibited by a rat can be systematically modulated by genetic variability" (823). Svartberg and Forkman (2002) concluded that playfulness constitutes a stable personality trait in dogs that varied among individuals and breeds while McGuire, Raleigh, and Pollack (1994) identified "playful/curious" as a personality trait in vervet monkeys. Finally, Staes and her associates (2016) concluded, "Personality traits typically have heritabilities ranging from 0 to 60% in species, such as dumpling squid (*Euprymna tasmanica*), rhesus macaques (*Macaca mulatta*), chimpanzees (*Pan troglodytes*), and humans (*Homo sapiens*)" (1).

Olson and his colleagues (2001) measured playfulness as a personality trait in humans using a single item and found correlations in 195 monozygotic twins of $r = .29$ but only $r = .14$ for dizygotic twins ($N = 141$). Self- and peer-ratings for facets of playfulness overlap between $r = .44$ and $r = .57$ in 226 dyads with mixed acquaintanceship (Proyer 2017), between $r = .33$ and $r = .57$ in ratings provided by partners in romantic relationships ($N = 77$ couples)(Wolf, Brauer, and Proyer 2016), and between $r = .31$ and $r = .50$ in a zero-acquaintance setting, that is, ratings provided for short written self-descriptions ($N = 144$) (Proyer and Brauer 2018). Finally, test-retest correlations also show temporal stability for the SMAP for a time span of twelve to sixteen weeks ($r_{tt} = 0.74$; $N = 30$) (Proyer 2012a) and the four facets of the OLIW for time spans of one week, two weeks, one month, and three months ($r_{tt} = .67 - .87$; $N = 200$) (Proyer 2017).

The literature reviewed in this article indicates that being playful, having a good sense of humor, and being fun loving are commonly regarded as personality traits or, at minimum, as characteristics strongly associated with—if not components of—personality traits and appear to be relatively stable over time. This suggests that they have some degree of heritability and, therefore, a genetic component.

Aims of the Study

Several of the studies cited above indicate that both males and females seek prospective mates similar to themselves in terms of having a good sense of humor. Research by Chick, Yarnal, and Purrington (2012), Chick (2013), and Proyer

and Wagner (2015) suggest that being playful and fun loving are also sought-after qualities in possible mates. Hence, we first sought to determine if mate preferences in our sample were concordant with previous research using the MPS. If they were, this would lend credibility to the use of the MPS across time and language groups and imply that the addition of the traits "playful," "good sense of humor," and "fun loving" were likely to replicate, as well. The goal of the study was to determine whether individual preferences for, and self-reports of these traits were correlated in a sample of unmarried males and females and an example of mutual mate preference.

Hypotheses

These last two points led to the following hypotheses:

> H1. Individuals desire long-term mates they regard as similar to themselves in terms of being playful, having a good sense of humor, and being fun loving. Therefore, preferences for possible long-term mates who rank higher in being playful, having a good sense of humor, and being fun loving will correlate positively and significantly with self-reports of the same variables.
>
> H2: Females and males will not differ with respect to the magnitude of the correlations between their preferences for prospective long-term mates and in self-reports of being playful, having a good sense of humor, and being fun loving.

Methods

Sample

Two hundred fifty-four undergraduate students, eighty-nine females and 164 males (one individual did not indicate a gender), at a large mid-Atlantic public university served as informants for this study. One hundred thirty-two of them completed an in-class survey during a fall semester while the remaining 122 completed the same survey online during the following spring semester. Three students indicated they were married while the remainder, minus seven cases with missing data, reported that they were single. We removed the married individuals from the data. There were no differences between the groups based on the method of survey administration. Sample members had a mean age of 20.28 years (N = 248, SD = 1.70). Sample members were students in a relatively large general education course, and they received five points extra credit for their participation in the survey. The response rate was 85.7 percent.

Instrument

The survey instrument consisted of three sections. In the first, we asked the students to respond to the following question with respect to a list of thirty-five personal characteristics.

> Please consider the list of personal characteristics below in terms of their desirability in a potential mate or marriage partner. Then rate the characteristics listed below in terms of how desirable you feel they would be in someone with whom you might have an enduring relationship that may include long-term partnership, marriage, and children. A rating of "1" would indicate that you feel that the characteristic is *not at all desirable* in a potential mate or marriage partner while a rating of "10" would indicate that you regard the characteristic as *extremely desirable.*

In the second section, we asked students to rate the same personal characteristics, arranged in reverse order, in response to the following question:

> Now, please consider the same list of personal characteristics again. This time, however, please rate the characteristics in terms of how applicable each of them are to you. That is, a rating of "1" would indicate that the characteristic is *not at all applicable* to you while a rating of "10" would indicate that it is *extremely applicable* to you.

Finally, we asked for the informants' gender, age, major, and semester standing; whether they felt their family income was below average, average, or above average; whether they perceived their grades as below average, average, or above average compared to other students at the university; the age at which they thought they would like to marry or establish a permanent relationship with a partner; and the number of children they would like to have. As we noted, we examined only the thirteen items derived from the MPS plus "playful," "good sense of humor," and "fun loving" added by Chick et al. (2012).

Analyses

To determine whether our results for the thirteen original items in the MPS were comparable to those from previous studies, we correlated the means for the sample responses for each item with available means for fifteen samples from ten other studies for which published data were available (Buss and Barnes 1986; Buss and Angleitner 1989 [4 samples]; Chang et al. 2011 [2 samples]; Gignac et al. 2018; Gignac and Starbuck 2019; Goodwin and Tinker 2002; Kamble et al. 2014 [2 samples]; Perilloux et al. 2011; Proyer and Wagner 2015; Zietsch et al.

2012). Two of these studies (Chang et al. 2011 and Kamble et al. 2014) included data from a thirty-seven–culture study by Buss and his associates (1990) in addition to more recent samples. We therefore also correlated our MPS results separately with the overall mean scores for the thirteen traits from Buss and his associates' study. Because two of the studies provided only rank orders (i.e., Gignac et al. 2018; Gignac and Starbuck 2019), we used Spearman's *rho* (ρ) for these analyses.

To test H1, we correlated respondent preferences for being playful, having a good sense of humor, and being fun loving with self-ratings of the same variables. Because we conducted multiple tests, we adjusted significance levels using the Holm-Bonferroni correction for multiple comparisons.

We anticipated that each of the three target personal characteristics is a quality sought in prospective mates by both males and females, so in H2 we posited that there would be no differences between males and females in terms of the magnitude of the correlations between their preferences for in prospective mates and their self-reports for being playful, having a good sense of humor, and being fun loving. To compare the correlations between preferences and self-reports for those variables with each other, we used *cocor* (Diedenhofen and Musch 2015), an R program that provides several ways to compare the magnitude of two correlations including Fisher's r to z-score transformation and Zou's (2007) method for providing confidence intervals. Although we had no hypotheses regarding the magnitude of the correlations between self-ratings and preferences for being playful, having a good sense of humor, and being fun loving and the original MPS traits, we nevertheless conducted *cocor* analyses for each of the three primary variables of interest with the remaining thirteen traits to determine possible differences among them for descriptive purposes.

Results

Figure 1 provides descriptive statistics for the importance of sixteen personal characteristics in a potential long-term partner. As in most previous studies using the MPS, we examined each trait for differences between females and males using t-tests for independent samples and Cohen's d to indicate effect size. Although we could have first examined the data with a multivariate analysis of variance (MANOVA) with gender as the independent variable, we did not do so

for three reasons. First, it is common to follow up a significant MANOVA with a series of univariate ANOVAs (or *t*-tests if the independent variable has two values) to determine which of the dependent variables are significantly affected by the independent variable. However, doing so fails to address possible correlations among the dependent variables, the point behind doing a MANOVA in the first place (Huberty and Morris 1989; Tonidandel and LeBreton 2013). Indeed, there were several moderately strong correlations among particular traits for the total sample, such as those between "fun loving" and "exciting personality" (r = .62), "college graduate" and "good earning capacity" (r = .53), and "good housekeeper" and "good earning capacity" (r = .46). The average correlation between the sixteen items was r = .22 with many at, or near, zero (e.g., "wants children" and "intelligent," r = - .01, "religious" and "college graduate," r = - .00, and "healthy" and "college graduate," r = .00). Correlations between traits for males and for females were similar in magnitude. Second, most of the authors of previous studies using the MPS (e.g., Buss and Barnes 1986; Chang et al. 2011; Zietsch, Verweij, and Burri, 2012) either used only *t*-tests or MANOVA with follow-up *t*-tests. So, our use of *t*-tests helps compare our results to those of previous studies. Finally, we were not especially concerned with whether variation in gender affected some linear combination of the sixteen personal characteristics. Instead, our interest was in each of them as conceptually independent.

With Holm-Bonferroni corrections for multiple comparisons, we found no significant differences at the p = .05 level between female and male preferences for any of the personal traits shown in figure 1. However, values for Cohen's *d* hint that females may have had a stronger preference than males for mates who are kind and understanding, while males may have a stronger preference than females for mates who are healthy and physically attractive. This mirrored Buss and Barnes's (1986) findings and are consistent with Chick's (1998, 2001) contention that females prefer more playful males because they regard them as less dangerous to themselves and their offspring than less playful males, while males prefer more playful than less playful females because playfulness in females connotes youthfulness and, therefore, fecundity. The results were also consistent with other previous MPS-based research (e.g., Buss et al. 1990; Gignac et al. 2018; Proyer and Wagner 2015) indicating that being kind and understanding, being intelligent, and having an exciting personality are regarded as very important in prospective mates by both males and females while being religious is regarded as of the least importance.

Correlations between our results for preferred mate characteristics in our

Figure 1. Means, standard deviations, minimum values, 95% confidence intervals for the total sample, females, males, and effect sizes (Cohen's *d*)[1] for female-male differences in16 personal characteristics[2] sought in a possible long-term mate.

Character Trait	Combined Ratings (N = 249 – 251)			Female Ratings of Males (N = 87 – 88)			Male Ratings of Females (N = 163 – 164)			Cohen's
	Mean	SD	95% CI	Mean	SD	95% CI	Mean	SD	95% CI	*d*
good sense of humor	**8.99**	**1.11**	**8.86 – 9.13**	**8.99**	**1.11**	**8.75 – 9.22**	**9.01**	**1.12**	**8.83 – 9.18**	**-0.02**
kind & understanding	8.90	1.15	8.76 – 9.04	9.11	1.08	8.89 – 9.34	8.77	1.17	8.60 – 9.96	0.30
fun loving	**8.71**	**1.16**	**8.57 – 8.86**	**8.77**	**1.00**	**8.54 – 9.01**	**8.69**	**1.17**	**8.51 – 8.87**	**0.07**
healthy	8.45	1.45	8.27 – 8.63	8.09	1.65	7.74 – 8.44	8.64	1.30	8.44 – 8.84	-0.38
playful	**8.44**	**1.24**	**8.29 – 8.60**	**8.39**	**1.32**	**8.11 – 8.67**	**8.48**	**1.20**	**8.29 – 8.66**	**-0.07**
exciting personality	8.31	1.42	8.13 – 8.48	8.34	1.52	8.02 – 8.66	8.30	1.37	8.08 – 8.51	0.03
intelligent	8.30	1.35	8.13 – 8.47	8.20	1.37	7.91 – 8.50	8.35	1.35	8.16 – 8.58	-0.11
easygoing	8.22	1.52	8.03 – 8.41	8.13	1.72	7.76 – 8.49	8.28	1.40	8.07 – 8.50	-0.10
wants children	8.01	2.23	7.73 – 8.29	7.98	2.50	7.45 – 8.51	8.04	2.08	7.72 – 8.36	-0.03
physically attractive	7.96	1.50	7.78 – 8.15	7.65	1.65	7.30 – 8.00	8.14	1.39	7.93 – 8.36	-0.33
college educated	7.43	2.51	7.12 – 7.74	7.83	2.39	7.32 – 8.33	7.22	2.56	6.84 – 7.63	0.24
good heredity	7.00	2.16	6.73 – 7.26	6.57	2.33	6.07 – 7.06	7.20	2.03	6.91 – 7.54	-0.30
good housekeeper	6.97	2.04	6.72 – 7.23	7.18	2.00	6.76 – 7.61	6.86	2.07	6.51 – 7.15	0.16
good earning capacity	6.76	2.20	6.48 – 7.03	6.88	2.18	6.41 – 7.34	6.70	2.22	6.37 – 7.05	0.08
creative and artistic	6.28	2.16	6.01 – 6.55	6.47	2.21	6.00 – 6.93	6.19	2.13	5.84 – 6.50	0.13
religious	5.61	2.75	5.27 – 5.95	5.77	2.72	5.20 – 6.35	5.55	2.76	5.15 – 6.00	0.08

[1] Cohen (1988) regarded a value of 0.2 to be a small effect size, 0.5 to be medium, and 0.8 to be large.
[2] *t*-tests with Holm-Bonferroni corrections for multiple comparisons indicate that no significant differences exist between male and female preferences at the 0.05 level for any of the personal characteristic descriptors.

total sample and those of ten other studies involving fifteen data sets ranged from a low of ρ = .36 (with Kamble and his associates' [2014] results from India) to a high of .93 (with Goodwin and her colleagues' [2002] results from England). However, the low correlation was an outlier because the second and third lowest correlations were ρ = .64 (with Chang and his associates [2012] reporting results from China derived from Buss and his colleagues' [1990] thirty-seven–culture study) and ρ = .65 (with Kamble and his associates' findings based on results from India derived from Buss and his colleagues' study). The remaining eleven correlations ranged between ρ = .70 (with results from Zietsch and his colleagues' [2012] study of 3,721 twins) and ρ = .88 (with results from Proyer and Wagner's [2015] study with a German-speaking sample). Our MPS results correlated, on average, at ρ = .78 (after removing the two sets of means from Buss and colleagues' thirty-seven–culture study) with those for the studies listed above and at ρ = .85 with summed means from Buss and his colleagues. After applying Holm-Bonferroni corrections for multiple comparisons, the results indicated that only the correlation between our results and those for Kamble and his associates' data from India was not significant at the .05 level. Hence, our findings for the thirteen common MPS items were, with one exception, highly concordant with those in the other studies. Finally, as Proyer and Wagner (2015) indicated, with "playful," "good sense of humor," and "fun loving" included in their study with a German-speaking sample, the means for their results correlated at ρ = .88 with those of Chick, Yarnal, and Purrington (2012). Given the correspondence between our results and other studies using the thirteen-item MPS as well as the robust correlation between the modified sixteen-item scales used by Chick, Yarnal, and Purrington (2012) and Proyer and Wagner (2015), we infer that the added items, "playful," "good sense of humor," and "fun loving," would likely have been ranked or rated similarly had they been included in studies that used the MPS in its original form.

Figure 2 indicates the means, standard deviations, and confidence intervals for the overall sample, as well as females and males, for self-ratings of the MPS items. Cohen's *d* indicates effect size for differences between females and males.

Figure 2 shows that study participants regarded themselves as kind and understanding with a good sense of humor but not especially creative and artistic or religious. When Holm-Bonferroni corrections for multiple comparisons are applied, only the self-ratings for "exciting personality" and "intelligent" differed significantly between females and males with females regarding themselves as ranking higher in both. There were no differences between females and males

Figure 2. Means, standard deviations, minimum value, and 95% confidence intervals for the total sample, females, males,[1] and effect sizes (Cohen's *d*) for female-male differences in self-assessment of 16 personal characteristics.

Character Trait	Combined Self-Ratings (N = 249 – 251)			Female Self-Ratings (N = 88 – 89)			Male Self-Ratings (N = 163 – 164)			Cohen's *d*
	Mean	SD	95% CI	Mean	SD	95% CI	Mean	SD	95% CI	
kind & understanding	8.88	1.25	8.72 – 9.04	8.95	1.25	8.69 – 9.22	8.85	1.26	8.65 – 9.04	0.09
good sense of humor	**8.82**	**1.39**	**8.65 – 8.99**	**9.06**	**1.14**	**8.82 – 9.30**	**8.69**	**1.50**	**8.45 – 8.92**	**0.27**
exciting personality	8.48	1.31	8.32 – 8.65	8.84	1.27	8.57 – 9.11	8.30	1.30	8.09 – 8.50	0.42 [1]
physically attractive	8.36	1.35	8.20 – 8.53	8.23	1.55	7.90 – 8.56	8.46	1.20	8.27 – 8.64	-0.17
intelligent	8.33	1.33	8.17 – 8.50	8.67	1.22	8.41 – 9.93	8.15	1.35	7.94 – 8.36	0.40 [1]
healthy	8.31	1.59	8.12 – 8.51	8.11	1.76	7.74 – 8.49	8.43	1.48	8.20 – 8.66	-0.20
easygoing	8.13	1.34	7.96 – 8.30	8.24	1.49	7.92 – 8.55	8.07	1.25	7.87 – 8.26	0.13
fun loving	**8.11**	**1.66**	**7.90 – 8.32**	**8.30**	**1.70**	**7.93 – 8.66**	**8.02**	**1.64**	**7.77 – 8.28**	**0.16**
good housekeeper	8.07	1.82	7.85 – 8.30	8.18	1.85	7.79 – 8.58	8.00	1.80	7.72 – 8.28	0.10
playful	**8.03**	**1.56**	**7.83 – 8.22**	**7.89**	**1.61**	**7.55 – 8.23**	**8.12**	**1.51**	**7.89 – 8.36**	**-0.15**
wants children	7.92	1.93	7.68 – 8.16	7.76	2.12	7.31 – 8.21	8.01	1.81	7.73 – 8.29	-0.13
college educated	7.60	1.98	7.35 – 7.84	7.76	2.02	7.33 – 8.19	7.51	1.97	7.21 – 7.82	0.13
good heredity	7.53	1.92	7.30 – 7.77	7.60	2.06	7.17 – 8.04	7.48	1.84	7.20 – 7.77	0.06
good earning capacity	7.40	1.79	7.18 – 7.62	7.40	1.92	6.99 – 7.80	7.40	1.72	7.13 – 7.67	0.00
creative and artistic	6.54	1.92	6.30 – 6.78	6.48	1.88	6.08 – 6.88	6.56	1.95	6.26 – 6.86	-0.04
religious	6.28	2.53	5.96 – 6.59	6.30	2.41	5.79 – 6.81	6.26	2.60	5.86 – 6.66	0.01

[1] *t*-tests with Holm-Bonferroni corrections for multiple comparisons indicate significant differences between male and female ratings at the 0.05 level.

in how they assessed themselves in terms of being playful, being fun loving, or having a good sense of humor.

Figure 3 presents correlations between self-assessments and degree of preference of the sixteen personal characteristics for the sample, for females, and for males. The mean correlation across all items for the sample was $r = .28$ (females $r = .26$; males $r = .29$).

In our first hypothesis, we posited that the correlations between preferences for prospective mates and self-assessments with respect to being playful, having a good sense of humor, and being fun loving would be positive and statistically significant. As indicated in figure 3, this is true for each of the three traits for the overall sample. However, for females, the correlation between their self-rating and rating of "playful" for prospective long-term mates was low ($r = .19$) and not significant. For males, the correlations between their self-rating and preference rating for each of the three traits were significant although that for "good sense of humor" was relatively low ($r = .19$). Hence, H1 is partially supported.

In H2, we hypothesized that females and males would not differ with respect to the magnitude of the correlations between their self-reports and preferences in prospective long-term mates in terms of their being playful, having a good sense of humor, and being fun loving. We again used *cocor* (Diedenhofen and Musch 2015) as it permits the comparison of two nonoverlapping correlations (that is, with no variables in common) based on dependent groups. We did this first for the entire sample and then for females and for males separately. There were no differences among preferences for those who were playful, had a good sense of humor, or were fun loving for the overall sample or for either gender. Hence, H2 is supported.

We also tested whether the correlations between self-assessments and levels of preference for those who were playful, had a good sense of humor, or were fun loving, each in turn, differed from the correlations between self-assessments and levels of preference for the those with the other thirteen personal characteristics. When we compared each of the personal characteristics using *cocor,* results indicated that the correlations for females and males in terms of trait self-ratings and preferences did not differ significantly at the 95 percent level (using the Holm-Bonferroni correction for multiple comparisons) for any of the sixteen terms. However, when we compared correlations for the entire sample between self-reports and levels of preference for our three target traits with each of the remaining thirteeen personal traits, the correlations between preferences and

Figure 3. Correlations (with 95% confidence intervals) between self-assessment and desirability of 16 personal characteristics in a possible long-term mate.*

	Sample (N = 251 – 254)		Females (N = 87 – 88)		Males (N = 161 – 162)	
Character Trait	*r*	95% CI	*r*	95% CI	*r*	95% CI
wants children	.62	.53 - .68 [1 2 3]	.68	.55 - .78 [1 2 3]	.57	.45 - .66 [2 3]
religious	.52	.41 - .60 [1 2 3]	.46	.28 - .61	.55	.44 - .65 [2 3]
creative and artistic	.45	.35 - .55 [3]	.42	.25 - .59	.48	.35 - .59 [2 3]
good earning capacity	.43	.33 - .53	.44	.27 - .60	.42	.29 - .54
healthy	.32	.21 - .43	.41	.23 - .58	.23	.09 - .38
playful	**.32**	**.20 - .43**	**.19**	**-.02 - .38**	**.39**	**.25 - .51**
exciting personality	.32	.20 - .42	.31	.11 - .49	.32	.18 - .46
easygoing	.32	.20 - .42	.33	.13 - .50	.31	.16 - .44
fun loving	**.30**	**.18 - .41**	**.32**	**.12 - .49**	**.28**	**.13 - .41**
intelligent	.30	.18 - .41	.34	.15 - .52	.31	.16 - .44
physically attractive	.29	.17 - .40	.30	.09 - .47	.27	.13 - .42
good heredity	.23	.11 - .35	.19	-.03 - .37	.27	.13 - .41
good sense of humor	**.21**	**.08 - .32**	**.29**	**.09 - .47**	**.19**	**.03 - .33**
good housekeeper	.20	.08 - .32	.05	-.16 - .25	.29	.14 - .42
college graduate	.19	.07 - .31	.08	-.14 - .28	.24	.10 - .38
kind and understanding	.14	.06 - .29	.06	-.16 - .26	.17	.08 - .37

[1] difference between correlations of self-rating and desirability of *playful* and self-rating and desirability of indicated trait significant at $p < 0.05$ after Holm-Bonferroni correction for multiple comparisons.
[2] difference between correlations of self-rating and desirability of *fun-loving* and self-rating and desirability of indicated trait significant at $p < 0.05$ after Holm-Bonferroni correction for multiple comparisons.
[3] difference between correlations self-rating and desirability of *good sense of humor* and self-rating and desirability of indicated trait significant at $p < 0.05$ after Holm-Bonferroni correction for multiple comparisons.
* There were no significant differences between the correlations for female and male preferences and self-ratings for any of the individual items.

self-reports for "wants children" and "religious" were significantly more robust than those for "playful," "good sense of humor," and "fun loving." The correlation between self-reports and preferences for those who are creative and artistic was stronger than that for those with a good sense of humor, as well. The correlations between preferences and self-reports were significantly stronger for "wants children" than those for each of the three target variables for females while, for males, this was true only for "good sense of humor" and "fun loving." However, for males, the correlations between preferences and self-reports for "religious" and "creative and artistic" were also significantly stronger than those for "good sense of humor" and "fun loving."

Discussion

This study supports the notion and extends knowledge about the important role of being playful and related traits (having a good sense of humor and being fun loving) in preference for long-term mates. Our findings based on the original thirteen items in the MPS, with one exception, are consistent with previous research. In particular, informants rated personal characteristics such as being kind and understanding, being healthy, and having an exciting personality quite highly but others, including being creative and artistic and being religious are relatively low in terms of their desirability in prospective long-term mates. Notably, the added terms, "sense of humor," "fun loving," and "playful" were rated in the top five of the sixteen items of the modified MPS. Our results also indicate that participants in our sample express moderately strong preference for long-term mates who are playful, fun loving, and have a good sense of humor. The last finding replicates numerous previous studies and implies, at least, the veracity of our results with the two related terms.

In H1, we asserted that individuals' preferences for long-term mates being playful, having a good sense of humor, and being fun loving will correlate positively with their own self-ratings of these personal characteristics. Our results, with one exception that appears to be due to the relatively small female sample size, support H1 and endorse the claim that these personal characteristics are subject to assortative mating. While we have no evidence to bear on the question of whether this result is due to social homogamy or has a genetic component, research by Zietsch and his colleagues (2012) on the other thirteen personal characteristics in the MPS indicated "widespread genetic influences" (1766).

In H2, we asserted that no differences exist between males and females in terms of the magnitudes of the correlations between preferences for and self-ratings for being playful, having a good sense of humor, and being fun loving. Indeed, we found no differences between males and females in terms of the magnitude of the correlations between preferences and self-ratings for any of the sixteen personal characteristics. Therefore, our results support H2 and indicate that the desirability for prospective long-term mates who are playful, have a good sense of humor, and are fun loving is a case of mutual mate choice even if the underlying reasons for those preferences may differ between females and males.

From a descriptive perspective, the results shown in figure 1 do not indicate any gender-based differences in terms of the desirability of the personal characteristics listed. Hence, while assortative mating appears to be consequential

for being playful, having a good sense of humor, and being fun loving, gender appears to exert little, if any, influence on preferences for them. With respect to self-reports, the results shown in figure 2 indicate that females and males regarded themselves very similarly with respect to fourteen of the sixteen personal characteristics. The only differences were that females regarded themselves more positively than did males in terms of having an exciting personality and being intelligent.

In sum, we found moderate correlations between self-reports of the degrees to which sample members regarded themselves as playful, having a good sense of humor, and being fun loving and the degrees to which they expressed preference for long-term mates with these personal characteristics. Gender appears to have little or no effect on these results, and while we did not ask for extensive demographic information, the sample was relatively homogenous in terms of age and family income. Hence, we conclude that assortative mating and social homogamy are important in seeking mates with respect to the personal characteristics of being playful, having a good sense of humor, and being fun loving. Further, the results reported here are consistent with the Signal Theory of Play (Chick 1998, 2001) and with the greater similarity in playfulness in romantic couples reported in previous research (Proyer et al. 2018, 2019).

Limitations and Suggestions for Future Research

A principal limitation of this research is that it is not based on data from couples but, instead, on preferences for traits in possible long-term mates. Two of our results, however, including religiosity ($r = .74$; Sherlock et al. 2017) and physical attractiveness ($r = .39$; Feingold 1988), are comparable for similar traits in previous research on couples and imply that the results in figure 3 would be similar had our sample consisted of actual partners. Nevertheless, although our results support the idea that individuals engage in assortative mating with respect to these traits, there is no guarantee that sample members, even if they have a preference for long-term mates who tend to match their self-ascribed characteristics in terms of being playful, being fun loving, and having a good sense of humor, or any of the other traits listed in the figures, will actually acquire mates with these characteristics. Hence, it is important to distinguish preferences and actual mating patterns in populations as these may differ (Baniel 2018).

A second concern is that our sample consisted of university undergradu-

ates. Although we would argue that their age makes them appropriate for questioning about long-term mate preferences, we cannot claim that they are representative of any larger population (see Henrich, Heine, and Norenzayan [2010] for a review of the overuse of samples in the social and behavioral sciences, especially college students, from Western, educated, industrialized, rich, and democratic societies). Hence, future research should include both younger and, especially, older individuals to assess possible age-related effects. Additionally, our sample included nearly twice as many males as females. Future research based on samples of adult heterosexual couples would alleviate these issues. Research based on long-term relationships between same gender pairs would also provide important information on assortative mating in terms of being playful, having a good sense of humor, and being fun loving. Research carried out in other cultural settings would shed light on the universality of our results.

Most of the sixteen terms used in the study are derived from a study published more than forty-five years ago (Gough 1973). Given the rapid change in the use and interpretation of words in recent years, especially under the influence of social media, it is possible that the individuals who completed the survey and who ranged in age from eighteen to thirty (only eight were over the age of twenty-three) interpreted some terms differently than we did. Although we have no evidence that this was the case, future research should account for this possibility.

Finally, most people would regard all of the sixteen items in our instrument to be relatively desirable as we included no terms with negative meaning or connotation, such as "hateful" or "arrogant." Perhaps because of this, we observed negative skewing in the scores for several of the items. While we tried several types of data transformations to address the issue, they ultimately did not affect the results. Still, future research should include items that have relatively neutral as well as negative meaning or connotation to address possible bias due to social desirability as well as permitting comparison of key terms with others with nonpositive implications. Although self-report measures, such as we used, can be vulnerable to social desirability biases, we have no evidence that subjective measures of being playful, having a good sense of humor, or being fun loving exhibit bias. Nonetheless, future research should involve evaluations by others, either peers or experts, and scales measuring adult playfulness, sense of humor, and being fun loving completed by informants that could be used instead of, or in conjunction with, self-reports.

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