Article

Are Women's Mate Preferences for Altruism Also Influenced by Physical Attractiveness?

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Abstract
Altruism plays a role in mate choice, particularly in women's preferences and in long-term (LT) relationships. The current study analyzed how these preferences interacted with another important mate choice variable, physical attractiveness. Here, female participants were presented with photographs of men of varying levels of physical attractiveness, alongside descriptions of them behaving either altruistically or not in different scenarios. The results showed women preferred altruistic men, particularly in LT relationships and that this interacted with physical attractiveness such that being both attractive and altruistic made a man more desirable than just the sum of the two desirable parts. Also, being altruistic made low attractive men more desirable but only for LT relationships. Finally, men who were just altruistic were rated more desirable than men who were just attractive, especially for LT relationships. Overall, these findings are discussed in terms of the role of altruism in mate choice, particularly in LT relationships and directions of future research.

Introduction

The "puzzle" of altruism, as Darwin (1871) described it, has received attention recently to explore whether sexual selection can play a role in solving it. For example, a number of studies have shown that individuals behave more altruistically with or in the presence of potential mates (Farrelly, Lazarus, & Roberts, 2007; Iredale, Van Vugt, & Dunbar, 2008; Tognetti, Berticat, Raymond, & Faurie, 2012; Van Vugt & Iredale, 2013). Similarly, other research has provided evidence that individuals, in particular women, show a preference for partners who are altruistic (Barclay, 2010; Farrelly, 2011, 2013; Moore et al., 2013; Oda, Shibata, Kiyonari, Takeda, & Matsumoto-Oda, 2013; Phillips, Barnard, Ferguson, & Reader, 2008; Stavrova & Ehlebracht, 2015).

Furthermore, previous research has sought to identify what qualities altruism may be signaling that makes it desirable in a potential mate. Both Farrelly (2011) and Oda, Okuda, Takeda, and Hiraishi (2014) explored whether altruism can better signal the genetic quality of the altruist, due to the "good genes" that are perhaps necessary for them to afford the costs of altruistic behavior (e.g. Miller, 2000) or good phenotypic quality, as the

nature of such behaviors may indicate that the altruist will be a good partner and parent (e.g., Kokko, 1998; Miller, 2007). This was achieved by examining how women's preferences for altruistic men varied across the menstrual cycle, where signals of good genetic quality are expected to be more desirable during the high fertile stage of the cycle, particularly for short-term (ST) mating (e.g. Gangestad & Haselton, 2015; Gangestad & Thornhill, 2008; Gildersleeve, Haselton, & Fales, 2014). Both Farrelly (2011) and Oda et al. (2014) were consistent in finding that not only were there no effects of menstrual cycle stage on women's preferences for altruistic traits in men but also that there were increased preferences for men in long-term (LT)

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relationships who displayed in altruism in different contexts (Farrelly, 2011) and toward different recipients (Oda, Okuda, Takeda, & Hiraishi, 2014). Therefore, both studies conclude that altruism functions in mate choice as a signal of phenotypic qualities, rather than predominantly a signal of genetic quality.

Further support for this is the consistent finding in research of altruism being more desirable in LT partners (Barclay, 2010; Farrelly, 2013; Moore et al., 2013) as well as altruists being more likely to enter LT relationships (Stavrova & Ehlebracht, 2015) and assortative mating for altruistic characteristics among married couples in Senegal (Tognetti et al., 2012). However, caution needs to be exercised when examining whether a specific trait is a signal of either genetic or phenotypic qualities based on relationship length alone. This is because this may not be a clear indication of what is being signaled, as not all preferences in either ST or LT partners are for traits that signal genetic or phenotypic quality, respectively (Buss & Shackelford, 2008). Similarly, any variation for a complex psychological trait such as altruism will be the product of both genetic and phenotypic/environmental causes. Overall, though, such findings highlight at least in what context women find altruistic men more desirable (which is LT relationships) and as a result contributes to our understanding of altruism's role in human mate choice.

This role can be further understood by examining what happens to the desirability of men when signals of altruistic behavior vary concurrently with other desired traits in mate choice. Knowledge of this would help us to further understand the trade-offs and signals associated with sexually selected altruism. This study aimed to answer this, by building on the above findings with an examination of how women's preferences for altruistic men in both ST and LT relationships were affected by the latter's physical attractiveness. There exists a great deal of evidence that physical attractiveness can act as a reliable signal of genetic quality (e.g., Rhodes, 2006) and also that women have greater preferences for physically attractive men in ST relationships (Buunk, Dijkstra, Fetchenhauer, & Kenrick, 2002; Li & Kenrick, 2006; Regan, 1998), particularly at the high fertile stage of the menstrual cycle (Gangestad, Garver-Apgar, Simpson, & Cousins, 2007; Gangestad, Thornhill, & Garver-Apgar, 2010). Therefore, the current study will further our understanding of how physical attractiveness interacts in women's mate preferences with altruism, which recent evidence (Farrelly, 2011; Oda et al., 2014) suggests is a signal of good partner/parenting qualities. As such, it will follow from previous research, which has shown that in forced choice scenarios females prefer mates who display "warmth/trustworthiness" (which will have parallels to altruistic behavior) than those who are physically attractive, particularly for longer, committed relationships (Fletcher, Tither, O'Loughlin, Friesen, & Overall, 2004).

Overall, the current study examined how the physical attractiveness and the level of altruism of men affected their desirability to women for both ST and LT relationships. It also builds on the previous research of Barclay (2010) and Farrelly (2011) by using short individual profiles presented to

participants and asking them to rate the desirability of each but with the addition of photographs of these individuals portraying them as either high or low in attractiveness. Based on these previous findings and theory outlined earlier, it was predicted that altruists will be rated more desirable than nonaltruists (Hypothesis 1) and that this preference will be greater for LT than ST relationships (Hypothesis 2). Furthermore, as the introduction of physical attractiveness as an additional variable in this study was novel, there is the exploratory hypothesis that this may further affect the findings relating to these first two hypotheses. Finally, based on the previous findings of Fletcher, Tither, O'Loughlin, Friesen, and Overall (2004), it was predicted that women will show preferences for altruism over physical attractiveness (Hypothesis 3) and that this preference will be greater for LT relationships (Hypothesis 4).

Material and Method

Participants

A total of 202 heterosexual women (age $M = 21.93$, $SD = 6.2$) took part in the experiment. Participants completed the study online using www.surveymonkey.com and were recruited via opportunistic sampling or received course credit for completing the study. This research was approved by the university ethics committee.

Materials

A series of male facial 2-D photographs were sourced from two different databases, pics.stir.ac.uk and the Radboud Faces Database (Langner et al., 2010), and were then independently assessed by three judges (the three authors) who selected the 12 highest and 12 lowest physically attractive men to be included in the study. Further validation of these selections were from the overall attractiveness ratings in the main study, whereby the high attractive men were rated overall as more attractive than the low attractive men, $F(1, 201) = 416.6$, $p < .001$, $\eta^2 = .68$.

Pairs of photographs were presented alongside rubrics of particular scenarios, with the person in each photo given a neutral label (e.g., "Person A"). These scenarios described conditions where individuals could behave altruistically and are based on similar scenarios used elsewhere (Farthing, 2005; Phillips et al., 2008). Following this, the rubric described how the two men behaved in response to this scenario, which was either high in altruism or low in altruism. Apart from these, participants also viewed pairs of photographs alongside neutral scenarios, with both individuals described as behaving neither altruistically nor nonaltruistically (e.g. "Person O and Person P both go out clothes shopping, Person O decides to buy a green jumper and Person P buys a pair of jeans"). Examples of the different scenarios are provided in Table 1.

Directly underneath this were two questions that related to each of the individuals. These asked how attractive the person was for two types of relationship, LT or ST. Definitions of these two relationship types (ST: a person with whom you

Table 1. Examples of Scenarios and Target Person Behaviors.

Scenario	Behavior of High Altruist	Behavior of Low Altruist
Person S and Person T are both at a picnic beside a river that has a fast current and they see a child being swept down the river, gasping for breath. A woman cries "Help! Save my child!"	Person T hears the mother's cries and decides to jump in the raging river to try to save the child	Person S sees the speed of the current and chooses not to try to help the child
Two people are walking through a busy town and notice a homeless person sitting near a café	Person E decides to go into the café to buy a sandwich and a cup of tea to give to the homeless person outside	Person F pretends to use his mobile phone and walks straight past the homeless person

Figure 1. Graph of mean desirability ratings ($\pm$ standard error [SE]) of men by level of attractiveness, level of altruism, and length of relationship.

would desire a brief affair or a one night stand. LT: a person with whom you desire a committed LT romantic relationship) were provided based on previous research (Farrelly, 2011). Both questions required a response on a 5-point Likert-type scale from *very unattractive* to *very attractive*. All research materials relevant to this article can be accessed by contacting the corresponding author.

Procedure

Participants first read an information sheet that described the study as investigating female perceptions of attractiveness in different scenarios and then provide informed consent. After giving details of their age, participants were told that they would be required to rate how attractive they found a number of different individuals for both ST and LT relationship and were provided with the descriptions of both relationship types. Participants then went on to view the different men with the accompanying scenarios and behaviors as outlined earlier.

In total, there were 12 scenarios that participants viewed, 8 of which were altruism conditions and 4 of which were neutral. The order in which participants saw these was randomly determined, and there were two orders that participants were randomly allocated to at the start of the study. As mentioned earlier, each scenario was presented with photographs of two individuals with details of their behavior in relation to the scenario. In each scenario, participants saw a high attractive and a low attractive individual paired together. Across these eight pairings in the "altruism" conditions, high attractive individuals were presented 4 times as being low in altruism and also 4 times as being high in altruism (the same was also true for the low attractive individuals).

After viewing all 12 scenarios and completing the attractiveness ratings for each individual, participants were fully
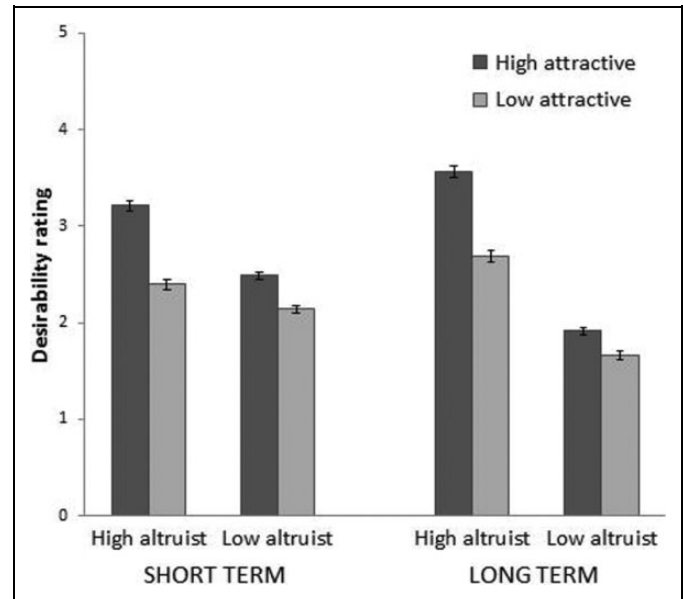
debriefed as to the true aims of the study and thanked for their participation.

Results

To test the hypotheses presented in the introduction, a repeated measures analysis of variance (ANOVA) was conducted, with attractiveness of target individual (high vs. low), level of altruism (high vs. low), and relationship length (ST vs. LT) as within-subjects variables. Subsequently are presented the main results and interactions that are relevant to the hypotheses, including, where necessary, pairwise comparisons (paired t-tests).

Hypothesis 1: Altruistic men will be more desirable than nonaltruistic men.

Individuals who displayed high levels of altruism were rated significantly more desirable overall than those displaying low levels of altruism, $F(1, 201) = 443.05$, $p < .001$, $\eta^2 = .69$, see Figure 1.

In terms of whether there was a further influence of the physical attractiveness on the desirability of altruism, a significant interaction was found between target attractiveness and level of altruism, $F(1, 201) = 178.28$, $p < .001$, $\eta^2 = .47$, see Figure 1. To further understand the nature of this interaction, the proportional change in the desirability ratings from low attractive to high attractive men was calculated for both low and high altruism levels. A paired t-test then revealed that the proportional increase in ratings from low to high attractive men was greater when they also displayed high altruism than when they also displayed low altruism, $t(201) = 8.05$, $p < .001$, $r < .27$.
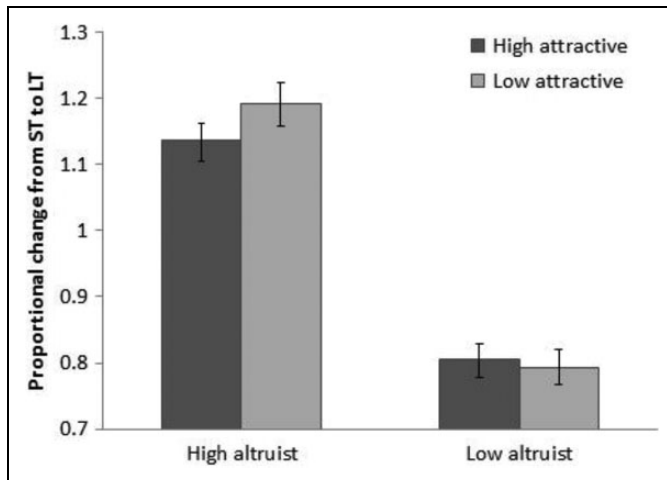
Figure 2. Graph of proportional change in desirability from short-term to long-term ($\pm$ standard error [SE]) of men by level of attractiveness and level of altruism.

Hypothesis 2: Altruistic men will be more desirable for LT than ST relationships.

There was a significant interaction between level of altruism and relationship length, $F(1, 201) = 167.29, p < .001, \eta^2 = .45$, see Figure 1. Further, pairwise comparisons revealed that high altruists were rated more desirable as LT than ST partners, $t(201) = 5.8, p < .001, r = .21$, whereas low altruists were actually rated more attractive as ST than LT partners, $t(201) = 12.9, p < .001, r = .42$.

In terms of whether there was a further influence of the physical attractiveness on the desirability of altruism in LT partners, a significant three-way interaction between attractiveness of target, level of altruism, and relationship length was found, $F(1, 201) = 7.27, p = .008, \eta^2 = .04$, see Figure 1. To better understand this interaction, proportional changes in ratings from ST to LT relationships were calculated and used as the dependent variable in a repeated measures ANOVA with attractiveness of target (high vs. low) and level of altruism (high vs. low) as within-subjects measures. This revealed a significant interaction, $F(1, 201) = 5.32, p = .022, \eta^2 = .03$, and subsequent pairwise comparisons revealed that the proportional change from ST to LT was significantly greater for low attractive men than high attractive men only when they displayed high altruism, $t(201) = 2.3, p = .022, r = .09$, whereas there was no such significant difference when they displayed low altruism, $t(201) = -.69, p = .49, r = .05$, see Figure 2. In other words, men low in physical attractiveness were preferred significantly more as LT partners by women only when they were also altruistic.

Hypothesis 3: Women will show a preference for altruistic men over physically attractive men.

To test this hypothesis, women's ratings of the desirability of men who displayed only high levels of either physical
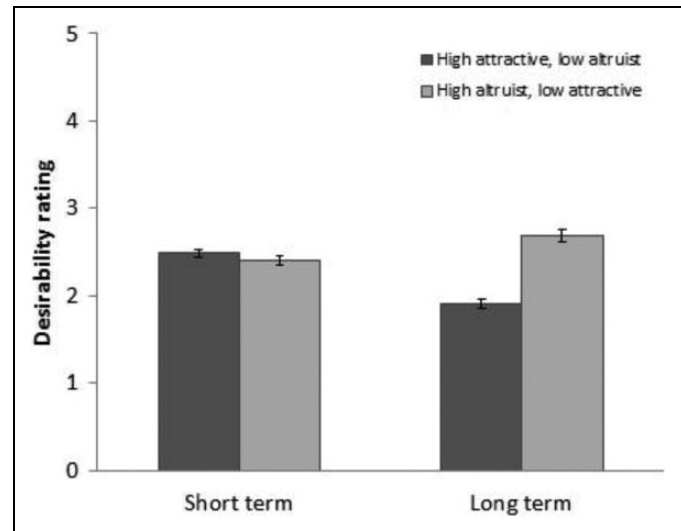

Figure 3. Graph of desirability ratings ($\pm$ standard error [SE]) of men displaying either high altruism or high attractiveness only by different relationship lengths.

attractiveness or altruism were compared. As a result, it was found that the desirability of low attractive men who displayed high altruism was higher than that of high attractive men who displayed low altruism, $t(201) = 6.37, p < .001, r = .22$, see Figure 3.

Hypothesis 4: Women will show a greater preference for altruistic men over physically attractive men for LT than ST relationships.

To test this hypothesis, a similar analysis to that of Hypothesis 3 was conducted with relationship length (ST vs. LT) included as a further within-subjects measure alongside trait displayed (high altruism vs. high attractiveness) in a repeated measures ANOVA. This revealed a significant interaction, $F(1, 201) = 135.34, p < .001, \eta^2 = .4$, see Figure 3. Subsequent pairwise comparisons revealed that women's ratings for men displaying altruism but not attractiveness were significantly higher than for men displaying attractiveness but not altruism only for LT relationships, $t(201) = 10.69, p < .001, r = .36$, and not for ST relationships, $t(201) = 1.55, p = .12, r = .11$.

Discussion

As predicted, women found men who behaved altruistically more desirable than those who did not. This therefore supports Hypothesis 1 and adds to the body of empirical evidence that shows altruism has an important role in human mate choice. Furthermore, women found altruistic men more desirable for LT relationships, which supports Hypothesis 2 and is in line with previous findings (e.g., Barclay, 2010; Farrelly, 2011, 2013; Oda et al., 2014). As an interestingly aside to this analysis, it was also found that nonaltruistic men were *more* desirable for ST relationships, which suggests that rather than altruism not being important in ST relationships (as previous

research suggests), in the present study, it is actually *undesirable*. This is a surprising finding, as little is known or researched about what being *un*-altruistic means in terms of mate choice, and is worthy of further investigation. As such, it may be related to female mate choice for other, less socially desirable traits that may have a role in male ST mating strategies such as the Dark Triad (e.g., Jonason, Li, Webster, & Schmitt, 2009).

The preference for altruistic men was also further influenced by their physical attractiveness, such that the increase in desirability of men as attractiveness increased was significantly greater when they were also altruistic. This suggests that altruism can have an additive effect to other mate choice qualities (in this case, physical attractiveness), such that possessing both qualities has a greater effect on a man's desirability than just a combination of their individual desirability. Also, the higher preference for LT over ST relationships with men low in attractiveness when they were altruistic suggests that being altruistic may act as a reliable mating strategy for acquiring LT partners for such men. Further investigation, such as examining how men of different attractiveness levels use altruistic acts as LT courtship displays, would explore this possibility in more depth.

Furthermore, the finding that high altruistic/low attractive men were rated more desirable than low altruistic/high attractive men offers support for Hypothesis 3, and further analysis that revealed that this was only significant for LT relationships offers support for Hypothesis 4. This suggests that if a man possesses only one of these traits, it is altruism that is more valuable, particularly for LT relationships. This, together with the above findings, provides further evidence of the importance of altruism in women's mate choice preferences, even when it is presented with other notable mate choice traits (such as physical attractiveness). Furthermore, by showing that this effect is even greater for LT relationships, more evidence is provided for altruism being a highly important characteristic trait women look for in LT partners.

To properly interpret these findings, it is also important to consider some limitations in the methods used. Firstly, both men in some scenarios (i.e., the one who behaved altruistically and the one that did not) were presented together, such as in the first example in Table 1 (rescuing a child from a river). As a result, this may mean that the nonaltruist in these scenarios may signal other traits as well such as lack of awareness (empathy) or apathy. Although such traits will most likely relate to or be part of a low altruistic nature in such individuals, future research could examine profiles presented alone to avoid any possible confounding effect of comparing the altruism levels of two men simultaneously. Another consideration is that by using a range of different scenarios in this study, possible characteristics may have been signaled other than just altruism. For example, the moral consequences of behaving altruistically in some scenarios were higher than others, for example, comparing attempting to save a child from drowning with buying food for a homeless person. Another example is that altruistic behavior in these two scenarios will also vary in the degree to which physical strength/prowess is also signaled, which will be higher when jumping into a river to save a child than when buying a sandwich. Overall, though, all scenarios used in this study can be considered to act as reliable signals of altruism, even if individual scenarios may be able to signal other traits as well. This therefore makes the findings in this study from women's ratings of altruistic behavior across all scenarios still valid. Future research however may wish to explore the different types of altruism signaled in these individual scenarios separately in more detail, such as heroism (Farthing, 2005, 2007; Kelly & Dunbar, 2001) or charitable giving (e.g., Barclay, 2010; Iredale et al., 2008). Such research would need to control for the extraneous variables that may also be signaled (e.g., physical strength across different heroic scenarios) to ensure that only the value of that type of altruism in mate choice is reliably being examined.

It will be important for additional research to build on these findings in certain directions to further aid our understanding. Firstly, an examination of menstrual cycle effects may shed some light on the results obtained here. In particular, how they may affect the potential weightings of altruism and physical attractiveness in women's ratings of men's desirability across the cycle. Also, future research needs to examine the effects found here in men's ratings of the desirability of altruistic women as well. This is because there is a lack of such research in this area, as most studies have concentrated on only women's ratings. However, when both sexes are investigated, it has led to similar findings (e.g., Farrelly, 2013; Farrelly et al., 2007; Moore et al., 2013; Stavrova & Ehlebracht, 2015), suggesting that altruism has been shaped by mutual mate choice in humans (Miller, 2000). It is therefore important to see whether this is also the case when physical attractiveness is also explored alongside it. Also of value would be an exploration of the interaction of the different variables used here in real-world mate choice settings. Experimentally derived findings on mate choice decision making such as those outlined here can only benefit from seeing if the same findings are present when looking at actual relationships and interactions in the real world, which is a methodology successfully employed elsewhere (e.g., Phillips et al., 2008; Stavrova & Ehlebracht, 2015).

To conclude, these findings make a substantial contribution to our understanding of the role of altruistic behavior in human mate choice by including the previously unexplored additional variables of physical attractiveness. Overall, the results provide further support for the view that altruism acts as an important trait in mate choice, particularly for LT relationships. This has important implications for our understanding of how we understand the expression of altruism and other traits holistically by casting further light on the rich tapestry that is human mating. This is also evident in the fact that the current study also suggests that nonaltruism may have a role in mate choice, perhaps aligning the spectrum of behavior explored here with research on traits such as the Dark Triad. As such, the current study can aid our understanding of altruism not only in mate choice but also in different everyday occurrences of this ubiquitous but enigmatic trait.

Declaration of Conflicting Interests

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References

Barclay, P. (2010). Altruism as a courtship display: Some effects of third-party generosity on audience perceptions. *British Journal of Psychology*, *101*, 123–135.

Buss, D. M., & Shackelford, T. K. (2008). Attractive women want it all: Good genes, economic investment, parenting proclivities, and emotional commitment. *Evolutionary Psychology*, *6*, 134–146.

Buunk, B. P., Dijkstra, P., Fetchenhauer, D., & Kenrick, D. T. (2002). Age and gender differences in mate selection criteria for various involvement levels. *Personal Relationships*, *9*, 271–278.

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

Farrelly, D. (2011). Cooperation as a signal of genetic or phenotypic quality in female mate choice? Evidence from preferences across the menstrual cycle. *British Journal of Psychology*, *102*, 406–430.

Farrelly, D. (2013). Altruism as an indicator of good parenting quality in long-term relationships: Further investigations using the mate preferences towards altruistic traits scale. *The Journal of Social Psychology*, *153*, 395–398.

Farrelly, D., Lazarus, J., & Roberts, G. (2007). Altruists attract. *Evolutionary Psychology*, *5*, 313–329.

Farthing, G. W. (2005). Attitudes toward heroic and nonheroic physical risk takers as mates and as friends. *Evolution and Human Behavior*, *26*, 171–185.

Farthing, G. W. (2007). Neither Daredevils nor Wimps: Attitudes toward physical risk takers as mates. *Evolutionary Psychology*, *5*, 754–777.

Fletcher, G. J. O., Tither, J. M., O'Loughlin, C., Friesen, M., & Overall, N. (2004). Warm and homely or cold and beautiful? Sex differences in trading off traits in mate selection. *Personality and Social Psychology Bulletin*, *30*, 659–672.

Gangestad, S. W., & Haselton, M. G. (2015). Human estrus: Implications for relationship science. *Current Opinion in Psychology*, *1*, 45–51.

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., & Thornhill, R. (2008). Human oestrus. *Proceedings of the Royal Society B: Biological Sciences*, *275*, 991–1000.

Gangestad, S. W., Thornhill, R., & Garver-Apgar, C. E. (2010). Fertility in the cycle predicts women's interest in sexual opportunism. *Evolution and Human Behavior*, *31*, 400–411.

Gildersleeve, K., Haselton, M. G., & Fales, M. R. (2014). Do women's mate preferences change across the ovulatory cycle? A meta-analytic review. *Psychological Bulletin*, *140*, 1205–1259.

Iredale, W., Van Vugt, M., & Dunbar, R. (2008). Showing off in humans: Male generosity as a mating. *Signal*, *6*, 386–392.

Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The Dark Triad: Facilitating a short-term mating strategy in men. *European Journal of Personality*, *23*, 5–18.

Kelly, S., & Dunbar, R. I. M. (2001). Who dares, wins. *Human Nature*, *12*, 89–105.

Kokko, H. (1998). Should advertising parental care be honest? *Proceedings of the Royal Society B: Biological Sciences*, *265*, 1871–1878.

Langner, O., Dotsch, R., Bijlstra, G., Wigboldus, D. H. J., Hawk, S. T., & van Knippenberg, A. (2010). Presentation and validation of the Radboud Faces Database. *Cognition and Emotion*, *24*, 1377–1388.

Li, N. P., & Kenrick, D. T. (2006). Sex similarities and differences in preferences for short-term mates: What, whether, and why. *Journal of Personality and Social Psychology*, *90*, 468–489.

Miller, G. F. (2000). *The mating mind: How sexual selection shaped the evolution of human nature*. London, England: William Heinemann.

Miller, G. F. (2007). Sexual selection for moral virtues. *The Quarterly Review of Biology*, *82*, 97–125.

Moore, D., Wigby, S., English, S., Wong, S., Székely, T., & Harrison, F. (2013). Selflessness is sexy: Reported helping behaviour increases desirability of men and women as long-term sexual partners. *BMC Evolutionary Biology*, *13*, 182.

Oda, R., Okuda, A., Takeda, M., & Hiraishi, K. (2014). Provision or good genes? Menstrual cycle shifts in women's preferences for short-term and long-term mates' altruistic behavior. *Evolutionary Psychology*, *12*, 888–900.

Oda, R., Shibata, A., Kiyonari, T., Takeda, M., & Matsumoto-Oda, A. (2013). Sexually dimorphic preference for altruism in the opposite sex according to recipient. *British Journal of Psychology*, *104*, 577–584.

Phillips, T., Barnard, C., Ferguson, E., & Reader, T. (2008). Do humans prefer altruistic mates? Testing a link between sexual selection and altruism towards non-relatives. *British Journal of Psychology*, *99*, 555–572.

Regan, P. C. (1998). What if you can't get what you want? Willingness to compromise ideal mate selection standards as a function of sex, mate value, and relationship context. *Personality and Social Psychology Bulletin*, *24*, 1294–1303.

Rhodes, G. (2006). The evolutionary psychology of facial beauty. *Annual Review of Psychology*, *57*, 199–226.

Stavrova, O., & Ehlebracht, D. (2015). A longitudinal analysis of romantic relationship formation: The effect of prosocial behavior. *Social Psychological and Personality Science*, *6*, 521–527.

Tognetti, A., Berticat, C., Raymond, M., & Faurie, C. (2012). Sexual selection of human cooperative behaviour: An experimental study in rural Senegal. *PloS One*, *7*, e44403.

Van Vugt, M., & Iredale, W. (2013). Men behaving nicely: Public goods as peacock tails. *British Journal of Psychology*, *104*, 3–13.