

Short term, long term: an unexpected confound in human-mating research

Paola Bressan 

Dipartimento di Psicologia Generale, University of Padova, Italy

Abstract

Here I report that, when partnered people judge the facial attractiveness of potential mates for a short- and a long-term relationship, the order in which the two conditions are presented biases responses in a systematic manner. Women and men display symmetrical biases. Women find men less attractive as new long-term partners if they have first imagined them as one-night stands. Men find women less attractive as one-night stands if they have first imagined them as new long-term partners. On a total sample of over 3,000 individuals from different studies, I show that both biases are robust and replicable in partnered people and neither is found in singles. Alas, so far no study has statistically controlled the effect of the order in which participants consider the two types of relationships. Whatever their interpretation, these biases are capable of producing spurious or inconsistent associations and mislead us when we compare studies that on the surface appear similar—most notably, direct and conceptual replications.

Keywords

facial attractiveness, mate choice, short-term relationships, long-term relationships, partnership status, order effects, sex differences

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For some, marriage is an institution and sex incidental.
For others, sex is an institution and marriage incidental.
—Nigerian proverb

1. Introduction

Across species, females tend to provide much greater parental investment than males do. Thus, they have evolved to choose their mates carefully, preferring those who will grant them the largest benefits. These benefits can be direct, such as food or help in rearing offspring, or indirect, such as “good genes” that will make for healthier, or sexier, sons and daughters

Correspondence:

Paola Bressan, Dipartimento di Psicologia Generale, Università di Padova, Via Venezia 8, 35131 Padova, Italy. E-mail: paola.bressan@unipd.it

(Kokko et al., 2003). If they are expected to allot resources to parental care or even just intense courtships, of course, males can gain from being somewhat picky themselves (Edward & Chapman, 2011); mate choice can then be considered “mutual”, as is the case in humans (e.g., Buss & Schmitt, 1993; Simão & Todd, 2002).

Yet relationships can last anywhere from a few minutes to a lifetime, and separate demands are placed on them according to their expected duration. The classical distinction, which has proved enormously successful since being first proposed (Buss & Schmitt, 1993), counterposes *short-term* mating (one-night stands and brief affairs) to *long-term* mating (durable, stable relationships such as marriage).

Evolutionary psychology theory has made much of this contrast. For example, if women experience ovulation-related cycle shifts in their preferences for certain male features, such shifts are predicted (and found: Gildersleeve et al., 2014) to occur only when men are evaluated as sex partners for a “here and now” encounter rather than as prospective husbands. Because the nature of relationships as conveyed by their expected duration is so important on theoretical grounds, most researchers are now making this distinction explicit. Hence, study participants are being asked to assess potential partners in both a short- and a long-term context.

Of course, each context requires participants to picture themselves in that predicament, and one wonders whether what has been imagined earlier may influence what is imagined later. Effects of this nature are well known in psychological research (Schwarz, 1999). Yet, so far no study appears to have statistically controlled the order in which the short- and long-term conditions are presented.

In this paper, I show that the facial attractiveness of opposite-sex individuals as potential mates is influenced by whether the short- or long-term relationship context is presented first. I produce as evidence the results of three separate, independent online studies conducted from 2015 to 2019.

2. Methods

2.1. Participants

Study 1 included 481 women, all with a partner (median age = 23 years, range = 17–55 years). Study 2 included 1233 women, 687 with a partner and 546 without (median age = 23 years, range = 18–56 years). Study 3 included 1440 men, 734 with a partner and 706 without (median age = 23 years, range = 18–73 years). Thus the total sample comprised 3155 individuals, of whom 1902 were partnered and 1252 were single. Participants were Italian (with very few exceptions) and were recruited mostly through links posted on Italian universities’ online social networks and other social media. Data were collected in accordance with guidelines approved by the local Psychological Research Ethics Committee; informed consent was obtained from all participants.

2.2. Materials and procedure

The stimuli were color photographs of the faces of good-looking men (Studies 1 and 2, run on female participants) or women (Study 3, run on male participants). They were obtained through Internet searches for images of attractive individuals, and portrayed mainly models and actors, or actresses, little known in Italy. Stimuli and questions (in Italian) were presented via Google Forms. The specific faces and presentation details differed across studies, yet in each case participants were asked to assess the depicted person’s attractiveness as a potential partner, on a 0-10 scale from “not at all attractive” to “very attractive”. In Study 1, 12 photos were presented one at a time, accompanied by one of two possible labels (“This man is single” or

“This man is married”), and participants rated each man’s attractiveness. In Studies 2 and 3, 10 photos were presented in pairs, each featuring the same person only differing in eye color; participants rated the attractiveness of each member of the pair after indicating which of the two they preferred. A portion of the data of Studies 2 and 3, not discussed in this paper, has been published (respectively, Bressan & Damian, 2018; Bressan, 2020; see Bressan & Damian, 2018 for the method used in both studies).

In all studies, the exact same set of stimuli, all in the exact same order, was shown once in a long-term relationship context and once in a short-term one. The order of conditions (short-term first, long-term first) was counterbalanced as closely as possible across participants by creating separate links for people whose last name started with a letter from a different chunk of the alphabet.

3. Results

3.1. Order matters

On Study 1’s attractiveness ratings, I ran a repeated-measures ANOVA with a within-subjects factor of relationship context (short-term, long-term) and a between-subjects factor of context order (short-term first, long-term first). Men looked more attractive as short- than as long-term partners, $F(1, 479) = 108.62$, $p < .0001$, but this effect was qualified by an interaction with context order, $F(1,479) = 14.07$, $p = .0002$. Men’s attractiveness as long-term partners decreased if they had been first imagined as short-term ones. The effect was not symmetrical: first imagining men as long-term partners did not change their subsequently rated attractiveness as short-term ones (Figure 1, left panel).

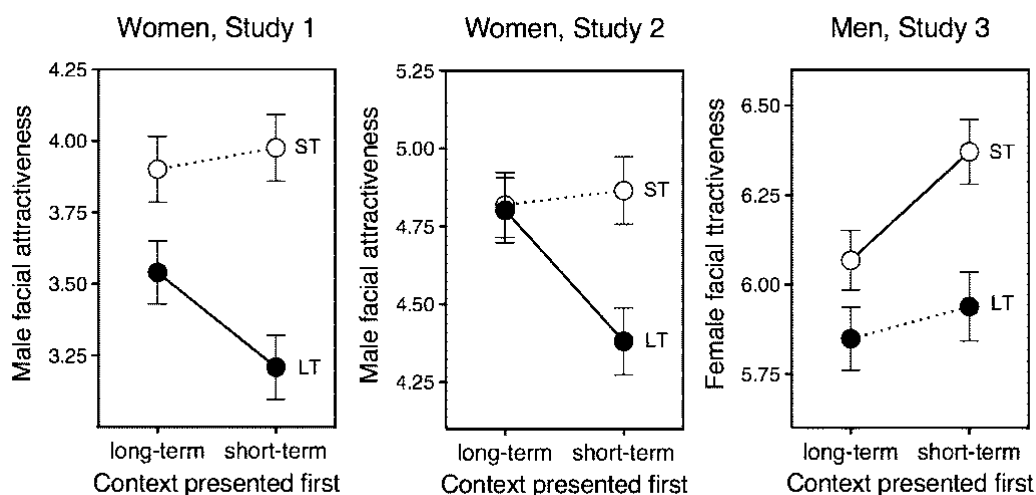


Fig. 1. Mean facial attractiveness of the same individuals considered as potential short-term (open symbols) and long-term (solid symbols) partners as a function of whether the long- or short-term relationship context is presented first. All ratings were given on a 0-10 scale by partnered people. Error bars indicate one standard error of the mean. **Left panel:** Women’s ratings of male faces (Study 1, $N = 481$). **Middle panel:** Women’s ratings of male faces (Study 2, $N = 687$). **Right panel:** Men’s ratings of female faces (Study 3, $N = 734$).

In the interests of replicability, I analyzed two additional sets of relevant data that had been collected for a different purpose but with similar methods (Studies 2 and 3). In Study 1 all

participants were partnered, whereas Studies 2 and 3 included both partnered and single participants. Therefore, partnership status was added as a between-subjects factor in the repeated-measures ANOVA on attractiveness ratings. Studies 2 and 3 were virtually identical to one another, but Study 2 was run on women (and presented male faces), while Study 3 was run on men (and presented female faces).

Study 2's data showed that the relationship-context order effect was specific to partnered women, as revealed by a triple interaction between context, context order, and participant's partnership status, $F(1, 1228) = 13.57, p = .0002$. Separate ANOVAs indicated that single women did find men more attractive as short- than as long-term partners, $F(1, 543) = 23.46, p < .0001$, and the order in which the two contexts were presented did not matter, $F(1, 543) = 1.25, p = .26$. Thus, there was no significant order bias for single women. On the other hand, partnered women showed a bias in the same direction as in Study 1. A man's attractiveness as a long-term partner dropped if the same man had previously been imagined as a one-night stand, $F(1, 685) = 43.46, p < .0001$. As in Study 1, the bias only applied to women's long-term judgments; there was no order effect for short-term ones (Figure 1, middle panel). Figure 2 (left panel) provides complementary information by plotting the effects of having a partner relative to the "neutral" condition of being single.

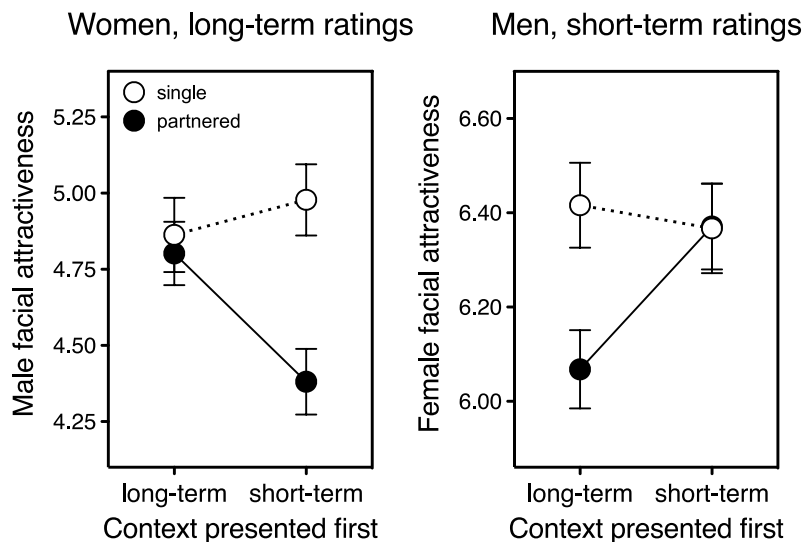


Fig. 2. Mean facial attractiveness of potential partners as estimated on a 0-10 scale by single (open symbols) and partnered (solid symbols) participants. Ratings are plotted as a function of whether the long- or short-term relationship context is presented first. Error bars indicate one standard error of the mean. Being attached reduced faces' attractiveness when conditions were presented in the critical order (short-term first for women, long-term first for men: solid symbols sit lower than open ones), whilst it made no significant difference if the order was reversed. **Left panel:** Attractiveness of men as potential *long-term* partners, judged by partnered ($N = 687$) and single ($N = 545$) women in Study 2. **Right panel:** Attractiveness of women as potential *short-term* partners, judged by partnered ($N = 731$) and single ($N = 701$) men in Study 3.

The results of Study 3, run on male participants, showed that the triple interaction between context, context order, and participant's partnership status was significant in men too, $F(1, 1423) = 9.46, p = .002$. Again, single men gave higher attractiveness ratings to women in a short-term context, $F(1, 698) = 82.08, p < .0001$, regardless of the order in which the two contexts were presented, $F(1, 698) = 0.63, p = .43$. Like in women, the bias was specific to

partnered participants and asymmetrical; unlike in women, however, it concerned short-term assessments rather than long-term ones. A woman's attractiveness as a one-night stand dropped if the same woman had previously been imagined as a long-term companion, $F(1, 725) = 11.55$, $p = .0007$ (Figure 1, right panel; Figure 2, right panel).

The effect size of the interaction between context and context order depended on study (partial eta-squared: Study 1, $\eta^2_p = .03$; Study 2, $\eta^2_p = .06$; Study 3, $\eta^2_p = .02$), with the largest of these figures being about the size of the difference in verbal fluency between females and males.

3.2. *Attractiveness in context*

The attractiveness scores given in the two relationships contexts were strongly correlated, $r(3144) = .90$, suggesting that people judged a prospective mate's attractiveness with similar criteria however long the liaison was presumed to last. How alike these criteria are, of course, is bound to depend on how much potential partners vary in features specific to one or the other type of relationship: for example, smaller correlations between attractiveness ratings should be expected in response to cues of male paternal investment or female faithfulness (important in a long-term context only), as opposed to generic good looks (appreciated across the board).

Could some such cues be regarded or weighted differently depending on whether a brief affair or a committed relationship is imagined first? Indeed, when they assessed a man's desirability as a stable companion after (rather than before) considering him as a one-night stand, not only did partnered women produce lower ratings, but such ratings had less in common with those given in the short-term condition (Study 1: $r(238) = .72$ vs $r(243) = .83$, $z = -2.79$, $p = .005$; Study 2: $r(329) = .85$ vs $r(358) = .92$, $z = -4.46$, $p < .0001$). This suggests that the former focus on typical short-term perks may have induced participants to switch their attention to different features: for example, to reduce the weight earlier given to pure physical appeal in favor of signs of maturity, status, or of a pleasant personality (like a smiling expression: e.g., Okubo et al., 2015; Sutherland et al., 2015). Notably, this finding implies that presenting the short-term condition *before* the long-term one could help participants make a sharper distinction between the two scenarios.

No such order-dependent switch was observed in partnered men: although they did produce lower short-term ratings when considering long-term first (Figure 1, right panel), the correlation between the two sets of ratings did not significantly change (Study 3: $r(396) = .88$ vs $r(331) = .89$, $z = 0.24$, $p = .81$). There was no evidence, then, that men's focus on long- vs short-term facial attributes was affected to any appreciable extent by the order in which the two types of relationship were contemplated.

4. Discussion

This paper has shown that, in partnered women and men, the attractiveness of strangers as potential short- and long-term mates depends on which relationship context is presented first. One could come up with a variety of creative explanations of this bias and of the sex difference attached to it. Here I resist this temptation, and present instead these findings as evidence for a potential methodological confound we may wish to control.

Several published studies have collected and interpreted attractiveness ratings given to the same faces (or bodies, or voices, or people met on speed-dates) once in a short- and once in a

long-term relationship context. A systematic search¹ showed that hardly any of these studies counterbalanced the order in which the two conditions were presented to participants (the only exception was Perrett et al., 2002)—and apparently none controlled it in the analyses.

Sometimes, presentation order was impossible to determine from the studies' method section on account of ambiguous descriptions (Farrelly et al., 2016; Limoncin et al., 2015). In other cases, presentation order was randomized (Burriss et al., 2011a; Burriss et al., 2011b; Ciocca et al., 2014; Conway et al., 2010; Feinberg et al., 2012; Fraccaro et al., 2010; Jones et al., 2018; Little et al., 2007; Little et al., 2008; Little & Jones, 2012; Mogilski & Welling, 2017; O'Connor et al., 2014; Puts et al., 2011; Vukovic et al., 2011). A problem with this choice—one which is only obvious in retrospect—is that randomization of a variable that heavily affects the dependent measure introduces a great deal of noise. And occasionally, purely due to vagaries of chance, randomization may turn out to be a poor substitute for counterbalancing and proceed to create serious confounds in the data (Bressan, 2019).

In still other studies the order was fixed and this was stated clearly: long-term came first in one case (Li et al., 2013), short-term came first in all the others (Jauk et al., 2016; Lindová et al., 2016; Madison et al., 2018; Place et al., 2010; Puts, 2005; Roney et al., 2006; Tornquist & Chiappe, 2015; Varangis et al., 2012). More often, presentation order was not specified explicitly and could, at best, be inferred from formulations such as “participants rated how attractive they found the person as a long-term mate and as a short-term mate”. As far as I could establish, some of these studies started with the long-term context (Clarkson et al., 2020; Conroy-Beam & Buss, 2017; Donahue & Green, 2016; Margana et al., 2019; Schröder-Abé et al., 2016) and others with the short-term one (Cantú et al., 2014; Cowan & Little, 2013; Jünger et al., 2018; Lucas et al., 2011; Moore et al., 2013; Valentine et al., 2014).

This lack of standardization and control makes it difficult to interpret and compare the outcomes of different studies. Here, one auxiliary assumption (Earp & Trafimow, 2015) appears to be that presentation order does not matter to the final result—hence it scarcely needs to be mentioned, let alone investigated. This assumption, shared by all, turns out to be incorrect. Alas, the biases described here are clearly capable of producing misleading, confusing, and conflicting results. Look, for example, at Figure 1's middle panel. It depicts two sets of data (long-term first, short-term first) collected with the exact same task on separate samples of hundreds of partnered women, coming from the same population. These circumstances are quite promising, and it seems we really ought to trust these data. Yet, if the *short-term* context had happened to have been presented first, we would have felt confident in concluding that men look remarkably more attractive for a brief affair than for a stable relationship. If the *long-term* context had been presented first, however, we would have had good reason to report no evidence whatsoever that the temporal context of relationships plays a role on perceived attractiveness.

If we consider only each condition's first presentation and disregard the second (which is equivalent to having presented the two conditions to separate samples), we should conclude that in Studies 1 and 3 the relationship-context effect is “real”. Yet in Study 2, by the same criterion, the same effect appears to be spurious and created by presentation order alone. Note that these order biases, on their own, are entirely capable of producing apparent failures to replicate, not merely in conceptual replications but in direct ones too: that is, even if the replication adopts the same presentation order as the original study. The reason is that these biases emerge only in partnered people; however, a great many published studies do not report or even collect information on the participants' relationship status, unless they have a specific

¹ Search terms: attractiveness AND short-term AND long-term. Details and results can be found in the online material (see Data Availability section).

hypothesis about it. A random difference in the proportion of single and partnered participants between the original and replication studies is enough to ensure a momentous difference in their outcomes.

The moral is that overlooking minor, uninteresting, seemingly irrelevant methodological details can not only produce nonexistent associations and illusory null effects, but supply fertile ground for “failed” replications too. So, let’s not randomize but counterbalance; and then, let’s analyze what we have counterbalanced.

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Data Availability

The data associated with this research are available at <https://osf.io/7h9g6>

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References

- Bressan, P. (2019). Confounds in “failed” replications. *Frontiers in Psychology, 10*, Article 1884. <https://doi.org/10.3389/fpsyg.2019.01884>
- Bressan, P. (2020). In humans, only attractive females fulfil their sexually imprinted preferences for eye colour. *Scientific Reports, 10*, Article 6004. <https://doi.org/10.1038/s41598-020-62781-7>
- Bressan, P., & Damian, V. (2018). Fathers’ eye colour sways daughters’ choice of both long- and short-term partners. *Scientific Reports, 8*, Article 5574. <https://doi.org/10.1038/s41598-018-23784-7>
- Burriss, R. P., Welling, L. L. M., & Puts, D. A. (2011a). Men’s attractiveness predicts their preference for female facial femininity when judging for short-term, but not long-term, partners. *Personality and Individual Differences, 50*(5), 542-546. <https://doi.org/10.1016/j.paid.2010.11.022>
- Burriss, R. P., Welling, L. L. M., & Puts, D. A. (2011b). Mate-preference drives mate-choice: Men’s self-rated masculinity predicts their female partner’s preference for masculinity. *Personality and Individual Differences, 51*(8), 1023-1027. <https://doi.org/10.1016/j.paid.2011.08.018>

- Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: an evolutionary perspective on human mating. *Psychological Review*, *100*(2), 204-232.
<https://doi.org/10.1037/0033-295x.100.2.204>
- Cantú, S. M., Simpson, J. A., Griskevicius, V., Weisberg, Y. J., Durante, K. M., & Beal, D. J. (2014). Fertile and selectively flirty: women's behavior toward men changes across the ovulatory cycle. *Psychological Science*, *25*(2), 431-438.
<https://doi.org/10.1177/0956797613508413>
- Ciocca, G., Limoncin, E., Cellerino, A., Fisher, A. D., Gravina, G. L., Carosa, E., Mollaioli, D., Valenzano, D. R., Mennucci, A., Bandini, E., Di Stasi, S. M., Maggi, M., Lenzi, A., & Jannini, E. A. (2014). Gender identity rather than sexual orientation impacts on facial preferences. *Journal of Sexual Medicine*, *11*(10), 2500-2507.
<https://doi.org/10.1111/jsm.12633>
- Clarkson, T. R., Sidari, M. J., Sains, R., Alexander, M., Harrison, M., Mefodeva, V., Pearson, S., Lee, A. J., & Dixson, B. J. W. (2020). A multivariate analysis of women's mating strategies and sexual selection on men's facial morphology. *Royal Society Open Science*, *7*(1), Article 191209. <https://doi.org/10.1098/rsos.191209>
- Conroy-Beam, D., & Buss, D. M. (2017). Euclidean distances discriminatively predict short-term and long-term attraction to potential mates. *Evolution and Human Behavior*, *38*(4), 442-450. <https://doi.org/10.1016/j.evolhumbehav.2017.04.004>
- Conway, C. A., Jones, B. C., DeBruine, L. M., & Little, A. C. (2010). Sexual dimorphism of male face shape, partnership status and the temporal context of relationship sought modulate women's preferences for direct gaze. *British Journal of Psychology*, *101*, 109-121. <https://doi.org/10.1348/000712609X436435>
- Cowan, M. L., & Little, A. C. (2013). The effects of relationship context and modality on ratings of funniness. *Personality and Individual Differences*, *54*(4), 496-500.
<https://doi.org/10.1016/j.paid.2012.10.020>
- Donahue, J. K., & Green, M. C. (2016). A good story: Men's storytelling ability affects their attractiveness and perceived status. *Personal Relationships*, *23*(2), 199-213.
<https://doi.org/10.1111/pere.12120>
- Earp, B. D., & Trafimow, D. (2015). Replication, falsification, and the crisis of confidence in social psychology. *Frontiers in Psychology*, *6*, Article 621.
<https://doi.org/10.3389/fpsyg.2015.00621>
- Edward, D. A., & Chapman, T. (2011). The evolution and significance of male mate choice. *Trends in Ecology & Evolution*, *26*(12), 647-654.
<https://doi.org/10.1016/j.tree.2011.07.012>
- Farrelly, D., Clemson, P., & Guthrie, M. (2016). Are women's mate preferences for altruism also influenced by physical attractiveness? *Evolutionary Psychology*, *14*(1), 147470491562369. <https://doi.org/10.1177/1474704915623698>
- Feinberg, D. R., DeBruine, L. M., Jones, B. C., Little, A. C., O'Connor, J. J. M., & Tigue, C. C. (2012). Women's self-perceived health and attractiveness predict their male vocal masculinity preferences in different directions across short- and long-term relationship contexts. *Behavioral Ecology and Sociobiology*, *66*(3), 413-418.
<https://doi.org/10.1007/s00265-011-1287-y>

- Fraccaro, P. J., Feinberg, D. R., DeBruine, L. M., Little, A. C., Watkins, C. D., & Jones, B. C. (2010). Correlated male preferences for femininity in female faces and voices. *Evolutionary Psychology*, 8(3), 447-461. <https://doi.org/10.1177/147470491000800311>
- 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(5), 1205-1259. <https://doi.org/10.1037/a0035438>
- Jauk, E., Neubauer, A. C., Mairunteregger, T., Pemp, S., Sieber, K. P., & Rauthmann, J. F. (2016). How alluring are dark personalities? The Dark Triad and attractiveness in speed dating. *European Journal of Personality*, 30(2), 125-138. <https://doi.org/10.1002/per.2040>
- Jones, B. C., Hahn, A. C., Fisher, C. I., Wang, H., Kandrik, M., Han, C., Fasolt, V., Morrison, D., Lee, A. J., Holzleitner, I. J., O'Shea, K. J., Roberts, S. C., Little, A. C., & DeBruine, L. M. (2018). No compelling evidence that preferences for facial masculinity track changes in women's hormonal status. *Psychological Science*, 29(6), 996-1005. <https://doi.org/10.1177/0956797618760197>
- Jünger, J., Kordsmeyer, T. L., Gerlach, T. M., & Penke, L. (2018). Fertile women evaluate male bodies as more attractive, regardless of masculinity. *Evolution and Human Behavior*, 39(4), 412-423. <https://doi.org/10.1016/j.evolhumbehav.2018.03.007>
- Kokko, H., Brooks, R., Jennions, M. D., & Morley, J. (2003). The evolution of mate choice and mating biases. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 270(1515), 653-664. <https://doi.org/10.1098/rspb.2002.2235>
- Li, N. P., Yong, J. C., Tov, W., Sng, O., Fletcher, G. J. O., Valentine, K. A., Jiang, Y. F., & Balliet, D. (2013). Mate preferences do predict attraction and choices in the early stages of mate selection. *Journal of Personality and Social Psychology*, 105(5), 757. <https://doi.org/10.1037/a0033777>
- Limoncin, E., Ciocca, G., Gravina, G. L., Carosa, E., Mollaioli, D., Cellerino, A., Mennucci, A., Di Sante, S., Lenzi, A., & Jannini, E. A. (2015). Pregnant women's preferences for men's faces differ significantly from nonpregnant women. *Journal of Sexual Medicine*, 12(5), 1142-1151. <https://doi.org/10.1111/jsm.12849>
- Lindová, J., Little, A. C., Havlíček, J., Roberts, S. C., Rubešová, A., & Flegr, J. (2016). Effect of partnership status on preferences for facial self-resemblance. *Frontiers in Psychology*, 7, Article 869. <https://doi.org/10.3389/fpsyg.2016.00869>
- Little, A. C., Burriss, R. P., Jones, B. C., DeBruine, L. M., & Caldwell, C. A. (2008). Social influence in human face preference: men and women are influenced more for long-term than short-term attractiveness decisions. *Evolution and Human Behavior*, 29(2), 140-146. <https://doi.org/10.1016/j.evolhumbehav.2007.11.007>
- Little, A. C., & Jones, B. C. (2012). Variation in facial masculinity and symmetry preferences across the menstrual cycle is moderated by relationship context. *Psychoneuroendocrinology*, 37, 999-1008. <https://doi.org/10.1016/j.psyneuen.2011.11.007>
- Little, A. C., Jones, B. C., Burt, D. M., & Perrett, D. I. (2007). Preferences for symmetry in faces change across the menstrual cycle. *Biological Psychology*, 76(3), 209-216. <https://doi.org/10.1016/j.biopsycho.2007.08.003>

- Lucas, M., Koff, E., Grossmith, S., & Migliorini, R. (2011). Sexual orientation and shifts in preferences for a partner's body attributes in short-term versus long-term mating contexts. *Psychological Reports, 108*(3), 699-710.
<https://doi.org/10.2466/07.PR0.108.3.699-710>
- Madison, G., Holmquist, J., & Vestin, M. (2018). Musical improvisation skill in a prospective partner is associated with mate value and preferences, consistent with sexual selection and parental investment theory: Implications for the origin of music. *Evolution and Human Behavior, 39*(1), 120-129.
<https://doi.org/10.1016/j.evolhumbehav.2017.10.005>
- Margana, L., Bhogal, M. S., Bartlett, J. E., & Farrelly, D. (2019). The roles of altruism, heroism, and physical attractiveness in female mate choice. *Personality and Individual Differences, 137*, 126-130. <https://doi.org/10.1016/j.paid.2018.08.018>
- Mogilski, J. K., & Welling, L. L. M. (2017). The relative importance of sexual dimorphism, fluctuating asymmetry, and color cues to health during evaluation of potential partners' facial photographs. *Human Nature, 28*(1), 53-75. <https://doi.org/10.1007/s12110-016-9277-4>
- 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*, Article 182.
<https://doi.org/10.1186/1471-2148-13-182>
- O'Connor, J. J., Jones, B. C., Fraccaro, P. J., Tighe, C. C., Pisanski, K., & Feinberg, D. R. (2014). Sociosexual attitudes and dyadic sexual desire independently predict women's preferences for male vocal masculinity. *Archives of Sexual Behavior, 43*(7), 1343-1353.
<https://doi.org/10.1007/s10508-014-0298-y>
- Okubo, M., Ishikawa, K., Kobayashi, A., Laeng, B., & Tommasi, L. (2015). Cool guys and warm husbands: The effect of smiling on male facial attractiveness for short- and long-term relationships. *Evolutionary Psychology, 13*(3), 1-8.
<https://doi.org/10.1177/1474704915600567>
- Perrett, D. I., Penton-Voak, I. S., Little, A. C., Tiddeman, B. P., Burt, D. M., Schmidt, N., Oxley, R., Kinloch, N., & Barrett, L. (2002). Facial attractiveness judgements reflect learning of parental age characteristics. *Proceedings of the Royal Society of London. Series B: Biological Sciences, 269*(1494), 873-880.
<https://doi.org/10.1098/rspb.2002.1971>
- Place, S. S., Todd, P. M., Penke, L., & Asendorpf, J. B. (2010). Humans show mate copying after observing real mate choices. *Evolution and Human Behavior, 31*(5), 320-325.
<https://doi.org/10.1016/j.evolhumbehav.2010.02.001>
- Puts, D. A., Barndt, J. L., Welling, L. L. M., Dawood, K., & Burriss, R. P. (2011). Intrasexual competition among women: Vocal femininity affects perceptions of attractiveness and flirtatiousness. *Personality and Individual Differences, 50*(1), 111-115.
<https://doi.org/10.1016/j.paid.2010.09.011>
- Puts, D. A. (2005). Mating context and menstrual phase affect women's preferences for male voice pitch. *Evolution and Human Behavior, 26*(5), 388-397.
<https://doi.org/10.1016/j.evolhumbehav.2005.03.001>

- Roney, J. R., Hanson, K. N., Durante, K. M., & Maestripieri, D. (2006). Reading men's faces: women's mate attractiveness judgments track men's testosterone and interest in infants. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 273(1598), 2169-2175. <https://doi.org/10.1098/rspb.2006.3569>
- Schröder-Abé, M., Rentzsch, K., Asendorpf, J. B., & Penke, L. (2016). Good enough for an affair. Self-enhancement of attractiveness, interest in potential mates and popularity as a mate. *European Journal of Personality*, 30(1), 12-18. <https://doi.org/10.1002/per.2029>
- Schwarz, N. (1999). Self-reports: how the questions shape the answers. *American Psychologist*, 54(2), 93-105. <https://doi.org/10.1037/0003-066X.54.2.93>
- Simão, J., & Todd, P. M. (2002). Modeling mate choice in monogamous mating systems with courtship. *Adaptive Behavior*, 10(2), 113-136. <https://doi.org/10.1177/1059712302010002003>
- Sutherland, C. A., Rowley, L. E., Amoaku, U. T., Daguzan, E., Kidd-Rossiter, K. A., Maceviciute, U., & Young, A. W. (2015). Personality judgments from everyday images of faces. *Frontiers in Psychology*, 6, 1616. <https://doi.org/10.3389/fpsyg.2015.01616>
- Tornquist, M., & Chiappe, D. (2015). Effects of humor production, humor receptivity, and physical attractiveness on partner desirability. *Evolutionary Psychology*, 13(4), 1-13. <https://doi.org/10.1177/1474704915608744>
- Valentine, K. A., Li, N. P., Penke, L., & Perrett, D. I. (2014). Judging a man by the width of his face: the role of facial ratios and dominance in mate choice at speed-dating events. *Psychological Science*, 25(3), 806-811. <https://doi.org/10.1177/0956797613511823>
- Varangis, E., Lanzieri, N., Hildebrandt, T., & Feldman, M. (2012). Gay male attraction toward muscular men: does mating context matter? *Body Image*, 9(2), 270-278. <https://doi.org/10.1016/j.bodyim.2012.01.003>
- Vukovic, J., Jones, B. C., Feinberg, D. R., DeBruine, L. M., Smith, F. G., Welling, L. L. M., & Little, A. C. (2011). Variation in perceptions of physical dominance and trustworthiness predicts individual differences in the effect of relationship context on women's preferences for masculine pitch in men's voices. *British Journal of Psychology*, 102(1), 37-48. <https://doi.org/10.1348/000712610x498750>