



# Non-Independent Mate Choice in Humans: An Investigation of Online Mate Choice Copying and Sex Differences

Cagla Tekin<sup>1</sup> · Ryan C. Anderson<sup>1</sup>

Received: 26 March 2021 / Revised: 1 July 2021 / Accepted: 1 July 2021  
© The Author(s), under exclusive licence to Springer Nature Switzerland AG 2021

## Abstract

Mate copying (MC) refers to the increased probability of preferring an individual as a mate, as a result of them having been chosen by same-sex peers previously. How changes in the world, such as the increased use of social networking sites, affect MC has not received much attention. Participants were shown photographs of opposite-sex target individuals, and told that the profiles had a high, moderate, or low number of opposite-sex Facebook friends. A two-way analysis of variance (ANOVA) indicated that opposite-sex profiles were considered the most desirable when no information was given about the gender distribution of their Facebook friends. Both men and women found opposite-sex profiles to be least desirable when they had a high number of opposite-sex friends. The findings contribute to the literature by providing further information about the mate selection processes for both sexes, and how social networking sites have changed the way interpersonal relationships are formed.

**Keywords** Mate copying · Mate selection · Opposite-sex friends · Attraction · Social networking

Research shows that non-human animals make use of social information when engaging in a variety of activities, including mate selection (Dugatkin, 1992; Vakirtzis, 2011). Using social information from and about others means that assessment of prospective mates can be influenced by observing the decisions of others—so-called non-independent mate choice or mate copying (Kavaliars et al., 2017). Mate copying (MC) refers to an increased probability of choosing an

opposite-sex individual as a mate, as a result of them having been chosen as a mate by individuals that are the opposite sex to them (Anderson & Surbey, 2014). In essence, the individual has been ‘endorsed’ by a previous or current mate, who is implicitly attesting to their mate value.

Initial studies providing evidence for human MC did not directly investigate the phenomenon but showed that, when evaluating opposite-sex others, humans and non-human animals are influenced by similar factors. Sigall and Landy (1973) investigated the effect of physical attractiveness on interpersonal choices. They placed participants in a room with a target male who was either presented as the boyfriend of or not associated with the female confederate (who was either attractive or unattractive). They found that participants rated the target male as more attractive when he was romantically associated with the attractive female compared to any of the other conditions. More importantly, it was found that the presence of the attractive female did not affect the attractiveness ratings given to target male, unless she was described as his girlfriend, suggesting that the crucial factor influencing attractiveness scores was the association between the target male and female confederate.

Research explicitly exploring MC in humans is more recent. Waynforth (2007) directly investigated the phenomenon and tried to identify factors influencing its occurrence,

## Highlights

- Mate copying is an emerging phenomenon in human attraction which has received very little attention in online contexts.
- By varying the number of opposite-sex online friends someone has, we found that opposite-sex profiles were considered the least desirable when they had a lot of opposite-sex friends.
- Both men and women found opposite-sex profiles to be most desirable when no information about the gender distribution of their online friends was given.
- These results suggest that the phenomenon of mate copying may proceed quite differently in an online environment than in real life.

✉ Ryan C. Anderson  
ryan.anderson1@monash.edu

<sup>1</sup> School of Psychological Sciences, Faculty of Medicine, & Health Sciences, Monash University, Wellington Road, NursingClayton, VIC 3800, Australia

such as relationship expectations and sexual experience. In the study, 112 female participants were first shown photographs of men and women, before giving attractiveness ratings. Two weeks later, male–female pairs, using the same photographs (this time explicitly described as dating), were again shown to participants and they re-rated target men. Results showed that higher initial female attractiveness ratings predicted increased male ratings when pictured in a couple. That is, the perceived attractiveness of a man increased when he was romantically paired with an attractive woman. Also, it was found that the woman's tendency to seek short-term sexual partners and having an increased level of sexual experience predicted less MC behaviour. Findings suggest that MC is used in situations when long-term partnership is desired and can be observed more often among those who are sexually inexperienced, as a strategy to solve informational and experiential constraints.

Evidence suggests the existence of MC behaviour among women, but to what extent similar behaviour persists among men is unclear (Anderson & Surbey, 2020). One reason that the majority of MC research concentrates on females is that the importance of mate selection is greater for females than it is for males (Rodeheffer et al., 2016). Whereas men can afford to be less discriminatory in their mating choices (Buss & Shackelford, 2008), an imprudent decision made by a woman can be potentially very costly (Peterson & Hyde, 2011; Vakirtzis & Roberts, 2010). It has additionally been argued that males are generally chosen as a mate (by females), rather than choosing a mate, as it is more important for females to ensure success of mating, since they invest more in the offspring through their bodily nutrients and parental investment (Kodric-Brown & Brown, 1984). Therefore, since the cost of mating is lower for males, they are generally less likely to exhibit MC (Kodric-Brown & Brown, 1984; Little et al., 2011), but note that the phenomenon has been demonstrated in men (Bowers et al., 2011; Little et al., 2008). Although there are studies investigating sex differences in MC behaviour, evidence on the topic is mixed. For instance, Place et al. (2010) investigated MC in a sample of 40 women and 40 men, using a naturalistic design. In the study, participants indicated their interest in having a relationship with the opposite-sex target individual before and after watching real-life speed dating videos involving target individuals. The key variable here was whether the target had been romantically accepted or rejected in the video. Both male and female participants showed increased relationship interest towards the rated person in the video, if the person had been romantically accepted. However, there was a difference between male and female participants' attraction ratings, such that, while men showed an increase in relationship interest with target individuals in all conditions, women exhibited an increase only if the individuals in the video were mutually interested and a decrease after seeing a

date where the individuals were not interested in each other. While these findings indicate that both sexes exhibit MC, they are also consistent with existing research suggesting that women are pickier and less sexually available to all potential suitors (Grammer et al., 2000).

Hill and Buss (2008) also investigated sex differences in MC. They compared desirability ratings given to ten opposite-sex targets depicted alone, depicted among members of the target's opposite sex, or among members of the target's same sex. They found that, while women found men who were depicted with other women as being more desirable, men found women depicted with other men as being less desirable. The fact that other males are paying attention to a certain female does not guarantee that she is a high-quality mate. Furthermore, the presence of other men might indicate increased intrasexual competition, making the female harder to acquire (Buss & Schmitt, 1993), and also, it increases his perceived risk of a costly investment in children that are not his genetic relatives (Buss & Schmitt, 1993). Dunn and Doria (2010) also found that, while female participants were positively influenced by visual information that indicated same-sex peers were attracted to a target male, and gave higher attractiveness ratings, compared to participants who were not presented with such information, there was no effect of same-sex peer attraction for male participants. Dunn and Doria's findings can be explained by the fact that as the cost of mating is higher for women (Kodric-Brown & Brown, 1984; Rodeheffer et al., 2016); they are more likely to use strategies that would improve their chances of choosing the right mate. For the same reason, they pay more attention to social information acquired from peers. However, in a recent meta-analysis, Gouda-Vossos et al. (2018) concluded that, although MC is more prominent among women, both sexes exhibit such behaviour when choosing between potential mates in order to avoid costs and reduce uncertainty.

Although studies show that MC can be observed in humans, extant research neglects to consider the immense technological changes of the past 20 years. The advent and popularisation of social media have greatly facilitated the mate searching process, as it provides an opportunity to socialise in whichever environment one prefers and allows access to an increased number of potential mates, compared to traditional social environments (Finkel et al., 2012). It also allows people to communicate with potential partners safely without the associated risks that come with meeting a stranger face-to-face (Finkel et al., 2012). However, as the internet is a qualitatively different platform than traditional social settings, it has changed the way that people represent themselves, and the cues that they base their evaluation of potential mates on.

One cue that potentially influences people's preferences is the number of friends one has on a given social media platform. Scott (2014) showed 112 participants

Facebook profiles which were either popular or unpopular (popular accounts had more friends than unpopular; controlling for the physical attractiveness of the owner of the Facebook profile), and asked participants to rate the attractiveness of the profile owner. Owners of popular profiles were rated as more physically and socially attractive and more approachable compared to unpopular profiles. The gender of one's Facebook friends also has an impact on how one is perceived by others. Stopfer et al. (2013) found that people with a high number of friends and a high number of posts from opposite-sex friends are perceived as more attractive, indicating the possibility of the existence of online MC behaviour. However, although evidence shows the influence of social media on impression formation and social preferences, there is still much unknown about gender differences in the field. While these findings show the changes in impression formation created by the use of social media, how such newly emerging platforms influence existing evolutionary processes, such as MC, remains unclear.

This study aims to understand if MC behaviour is exhibited in an online environment. In light of existing literature, the following hypotheses have been generated:

H1: Participants will exhibit online MC-like effects by giving higher attractiveness ratings to target individuals who have a high number of opposite-sex Facebook friends (compared to conditions where targets have either a medium or low number of opposite-sex friends, or where no information is given)—an attractiveness enhancement effect, and this effect will be stronger for female participants than for male participants.

H2: Participants will give lower attractiveness ratings for targets who have a low number of opposite-sex Facebook friends—an attractiveness diminution effect (compared to when no information is given), and this effect will be stronger for women than for men.

## Method

### Participants

Participants were 225 adults (41% female), aged between 18 and 35 years recruited through Facebook advertisements and Monash University social media pages. The mean age for female participants was 24 years ( $SD = 3.9$  years), and mean age for male participants was 22 years ( $SD = 4.4$  years). To be eligible to take part, participants needed to be (a) between the ages 18 and 35 and (b) heterosexual. It was determined prior to analysis that such a sample would be appropriate for a number of reasons. Such individuals are at the peak of their mate-seeking careers, and the stimuli provided depicted

individuals in this age bracket. It was considered that non-heterosexual individuals may be employing different criteria to their heterosexual counterparts when romantically evaluating people of the opposite sex. Participants who did not fit the criteria were excluded from the study. The majority of the participants were of European heritage (75.1%), and they indicated that English was their primary language (90.7%). Twenty-six percent of participants indicated that they were currently in a dating relationship, and 55.1% indicated that they were single. The remainder indicated they were currently married, widowed, or nominated 'other'. Upon completion of the study, participants were given an opportunity to enter a draw to win a \$50 gift voucher.

### Design

The study was entirely between-subjects, although, in order to obtain a more stable estimate of a participant's rating, four similar profiles were shown to each. The dependent variable was participants' ratings of the target individuals as prospective partners. The independent variables were 'participant gender' (male/female) and 'number of opposite-sex Facebook friends' (high/medium/low/no information given). In the 'high' condition, target individuals had approximately 90 percent opposite-sex Facebook friends (the number ranged from 264 to 285). In the medium condition target individuals had approximately 60% opposite-sex Facebook friends (the number ranged from 144 to 165). In the low condition, target individuals had approximately 30% opposite-sex Facebook friends (the number ranged from 99 to 105). Regardless of the condition they were in, individual profiles were always described as having 300 friends (on Facebook) in total. In the no information condition, participants were only given the total number (300) of the target individuals' Facebook friends, and no information on the gender distribution was provided. Participants were randomly allocated into one of the four gender distribution conditions, and they saw photographs of either four men or four women, always seeing opposite-sex targets.

### Materials and Procedure

The visual stimuli were taken from Chicago Face Database, a free resource consisting of 158 high-resolution, standardized photographs of males and females, between the ages of 18 and 40 years (Ma et al., 2015). The entire database of individuals had been pre-rated on attractiveness by a large American sample ( $N = 1087$ ). Four female and four male photographs were chosen from this database

for the current study based on the fact that their attractiveness scores ranged from 3.1 to 3.2 out of 7.

Photographs were presented to participants with a brief explanation consisting of four sentences describing: (1) the name of the target individual, (2) their relationship status, (3) their total number of Facebook friends, and (4) their total number of opposite and same-sex Facebook friends (for all but those in the no-information condition). All individuals were described as single and as having 300 Facebook friends in total.

Participants were initially asked to complete a demographics survey, consisting of items pertaining to their gender, sexual orientation, age, ethnicity, and relationship status. After completing this, each participant was presented with the same four opposite-sex individuals and asked to rate the attractiveness as a prospective partner of each target individual on a scale from 1 (not at all) to 7 (extremely). After completing the study, participants were taken to a debriefing page which included a thank you message and explained the true purposes of the study, providing background information on MC research.

## Results

### Preliminary Analyses and Descriptive Statistics

As there is some evidence that MC propensity varies depending on whether the individual doing the rating is single or in a relationship (Bressan & Stranieri, 2008), an independent-sample *t*-test was conducted to determine if there was any difference between these two groups on the dependent variable. A moderate difference was detected in the ‘medium number of opposite-sex friends’ condition,  $t(53) = 2.11$ ,  $p = 0.04$ ,  $d = 0.57$ , but not in any of the other conditions. As it was just the one condition, it was determined that continuing with the planned analyses would be appropriate.

It has additionally been demonstrated that age can influence the propensity of individuals to MC (Anderson & Surbey, 2014); thus, a series of zero-order correlations were performed between ‘age’ and ‘attractiveness as a prospective partner’. Moderate correlations were observed in the ‘high’,  $r = -0.29$ ,  $p = 0.03$ ,  $n = 56$ , and

‘no information’,  $r = 0.31$ ,  $p = 0.02$ ,  $n = 57$ , conditions. Accordingly, relationship status and age were entered as covariates into the inferential analyses.

The average attractiveness as a prospective partner (across the four target individuals that each participant saw) was calculated, and the averages per condition are presented in Table 1 below.

As can be seen in Table 1 above, attractiveness ratings given by men (to women) were generally higher than those given by women (to men). Ratings given for the various opposite-sex friends’ conditions varied but were the highest overall when no information about the gender distribution of someone’s opposite-sex friends was given.

A  $2 \times 4$  between groups analysis of covariance (ANCOVA) was conducted to compare the mean attractiveness scores between ‘gender’ (male/female) and ‘opposite-sex friends’ (high/medium/low/no information). Men gave higher attractiveness ratings (to women) than women did (to men),  $F(1, 217) = 20.99$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.09$ , and there was also an effect of how many opposite-sex friends an individual was described as having,  $F(3, 217) = 3.77$ ,  $p = 0.01$ ,  $\eta_p^2 = 0.05$ . Post hoc Bonferroni tests indicated that individuals were considered to be most attractive as a prospective partner when no information was given about how many opposite-sex friends they had. However, this condition was only statistically more attractive than individuals described as having a high number of opposite-sex friends (the least attractive condition for men and women;  $p = 0.03$ ). The pattern of responding (depending on the opposite-sex friends of the target) was similar between men and women,  $F(3, 217) = 0.56$ ,  $p = 0.64$ ,  $\eta_p^2 = 0.01$ . Neither age ( $p = 0.54$ ) nor relationship status ( $p = 0.16$ ) were significant covariates.

Although a one-way ANOVA indicated that there was no effect of opposite-sex friends for men,  $F(3, 127) = 1.04$ ,  $p = 0.38$ ,  $\eta_p^2 = 0.02$ ; there was for women,  $F(3, 127) = 3.49$ ,  $p = 0.02$ ,  $\eta_p^2 = 0.11$ . Post hoc testing indicated while neither men nor women perceived a difference between an individual being described as having a low number of opposite-sex friends and no information being given, women (but not men) perceived an individual as more attractive when no information was given than if the target man was described as having a high number of opposite-sex friends ( $p = 0.03$ ).

**Table 1** M (SD) average attractiveness as a prospective partner depending on participant gender and condition

Participant gender	Opposite-sex friends				Total
	High	Medium	Low	No information	
Male	2.76 (0.96)	3.11 (0.92)	2.83 (0.96)	3.03 (0.80)	2.93 (0.91)
Female	1.87 (0.82)	2.43 (0.89)	2.24 (1.01)	2.58 (0.82)	2.29 (0.91)
Total	2.42 (1.00)	2.80 (0.96)	2.57 (1.02)	2.86 (0.83)	2.66 (0.96)

## Discussion

The aim of this study was to further explore the phenomenon of MC by investigating whether MC-like effects can be observed in an online environment, while exploring potential gender differences. Target individuals' number of opposite-sex Facebook friends was manipulated in order to understand what effect this had on the perceived attractiveness of target individuals as prospective partners.

The hypothesis that participants would exhibit MC-like effects, by giving significantly higher attractiveness ratings to those who have a high number of opposite-sex Facebook friends, was not supported. Ratings of attractiveness as a prospective partner varied as a function of how many opposite-sex friends the target had (for both men and women), but the most attractive profiles were the ones where no relevant information was given. Results also failed to support the hypothesis that MC-like effects would be stronger among female than male participants. Variations in what participants found more or less attractive were essentially identical between male and female participants. The hypothesis that women would give lower attractiveness scores to men who have a low number of opposite-sex Facebook friends compared to if no information was given was supported, but again, male and female participants had a very similar pattern of responding.

One possible explanation for the lack of MC-like effects could be the fact that social networking sites have developed their own norms, and these norms are qualitatively different from those of real life. Although the current study eliminated many typical aspects of online social networks sites, it was similar to the standard format in general. As Mehdizadeh (2010) explains, social networking sites provide a new avenue where people can present themselves in entirely different ways. Compared to real life, social networking sites are highly controlled environments, as they allow profile owners to have complete power over the way they present themselves (Mehdizadeh, 2010). Social networking site users have freedom over deciding which parts of their personality they want to display, what kind of images of themselves they want to post, and the amount of personal information they want to share. Therefore, users can quite easily manipulate personal information in an attempt to create an image that will be desirable to others. Previous research shows that the association between online profiles and offline personality traits is weak (Turner & Hunt, 2014), suggesting a discrepancy between online self-presentations and real-life personality attributes. A high level of control over one's online profile also allows people to use social networking sites in a self-satisfying way, by presenting themselves as more confident, social, and popular by having a high number of virtual friends or by only emphasizing positive and sociable aspects of oneself. Kim and Lee (2011) showed that having a large

number of Facebook friends boosts self-esteem by creating a sense of connectedness.

Considering the amount of time social networking sites have been in our lives, it is reasonable to imagine that most users of social media are aware of the potentially deceptive nature of online presentations (Turner & Hunt, 2014). Therefore, it is understandable that when people are presented with any information regarding social networking platforms that encourage self-promotion, they regard it with some suspicion. Although there is research suggesting a positive influence of online popularity on perceived attractiveness (Scott, 2014), an increased emphasis on the number of friends that one has may even be perceived as bragging, leading to a negative impression (Scott & Ravenscroft, 2017).

In the current study, all target individuals were described through their total number of Facebook friends and the gender distribution of these friends. It is plausible to think that, when participants were presented with information regarding target individuals' virtual friends, they approached it with a certain level of scepticism, because adding people as friends and displaying the numbers may have been seen as a duplicitous strategy aimed at creating a desired social impression or self-satisfaction.

Relationships established on social networking sites are qualitatively different from those established in real life, as social networking sites provide a platform for an increased number of superficial relationships and emotionally detached communication (Mehdizadeh, 2010). As Moorman and Bowker (2011) explain, high-quality interpersonal relationships and intimacy are more typically developed through having common interests, sharing common personal issues, and participating in real-life shared activities. Evidence suggests that friendships established on the internet are perceived as less close and of lower quality than offline relationships because they lack interactive physical cues, such as eye contact and facial gestures, impeding the establishment of high-quality interactions (Kim et al., 2009). Although developing meaningful relationships via social media may be difficult, superficially adding new people to one's network is fairly easy; it is even possible to buy friends/followers in some social networking platforms. Therefore, one's number of social networking friends does not necessarily indicate a genuine social attractiveness, as a user with a large number of Facebook friends may have mindlessly added people into her/his network without putting any effort into making the relationship grow (Kim & Lee, 2011). As Tong et al. (2008) explain, having large numbers of friends can also indicate real-life isolation that is being compensated by adding people on social media platforms. Whereas the persistence of MC among humans (in offline contexts) involves an honest social endorsement of someone, a signal of online popularity is low-cost, possibly fraudulent, and probably carries far less

weight than a genuine offline ‘endorsement’ by a former or current partner.

In the current study, target individuals’ number of opposite-sex Facebook friends was used to indicate attractiveness as a prospective partner. Considering that there are essentially no costs associated with adding people as friends, having a high number of opposite-sex friends may not necessarily indicate social or romantic attractiveness, as these friends may not be more than passive observers of one’s profile (Kim & Lee, 2011). However, evidence suggests that MC behaviour emerges when a target individual has been previously chosen as a partner by peers, suggesting that perception of intimacy between the target individual and the third party is an important factor (Rodeheffer et al., 2016; Sigall & Landy, 1973). Therefore, it is possible that participants may have needed more information, on the quality of virtual relationships rather than simply the quantity to be able to make judgements on target individual’s potential as a prospective partner.

Additionally, it is unclear whether the conditions employed in the current study were sufficiently differentiated. Individuals were described as having 300 friends in total, and the proportion of opposite-sex friends varied within this. Individual profiles had somewhere between 99 and 285 opposite-sex friends (a variation of less than 200). Future studies may wish to considerably magnify this variance and compare say, a handful of opposite-sex friends to thousands.

Results also showed that female participants gave higher attractiveness ratings to target individuals in the ‘no information’ condition (where participants were not given any information on the gender distribution of target individuals’ Facebook friends), compared to target individuals who were described as having ~90% opposite-sex Facebook friends. This finding suggests that, although MC theory posits that one’s number of previous partners can have a positive influence on perceived attractiveness, having too many previous partners can have the opposite effect (Anderson & Surbey, 2014; Jones et al., 2007). For female participants, men having a high number of opposite-sex Facebook friends may have signalled the unreliability of a target individual as a partner and/or the possibility of promiscuity suggesting a man’s unwillingness to provide necessary resources. Having no information on the gender distribution of Facebook friends may have removed the negative influence of the possibility of unreliability and promiscuity, increasing attractiveness scores given to target individuals. Additionally, a reported high number of opposite-sex friends (90%) may seem to have an unrealistic exaggeration that elicited suspicion and/or distrust. Future probing qualitative studies gauging individual thought processes may clarify this issue.

From a social networking perspective, findings of the study can be related to how social media is being used. Social networking sites have started to replace traditional settings where

people get in touch with their existing friends or develop new friendships, as they allow individuals to communicate with others in a variety of ways, such as posting comments and status updates, chatting, and consuming information regarding the lives of others through viewing photographs (Kuss & Griffiths, 2011). As mentioned, regardless of the fact that evidence on the quality of relationships established on these new platforms is mixed, people perceive online friendships to be lower in quality than offline friendships (Antheunis et al., 2012). Therefore, it is possible that spending too much time online or having too many online friends can be a source of prejudice rather than attraction. As Tong et al. (2008) explain, having a large number of friends may lead to judgments that profile owners are not sociable and outgoing. It can create the impression that individuals with too many online friends are spending too much time on Facebook (or social media generally), adding friends out of loneliness rather than popularity, in an attempt to create connections in an environment where they feel more comfortable compared to face-to-face situations (Tong et al., 2008). When individuals with a high number of opposite-sex Facebook friends were presented, participants may have thought that such target individuals failed in real-life relationships with the opposite sex and they used virtual environments to compensate for unsuccessful face-to-face interactions. In the no information condition, however, not knowing the gender distribution of target individuals’ opposite-sex Facebook friends may have reduced participant prejudice toward target individuals, leading to higher attractiveness ratings.

## Limitations and Future Research

To our knowledge, this is the first study to investigate the existence of MC-like effects in an online context. The current study modified a commonly used paradigm in MC research, use of visual stimuli with a brief explanation, in order to determine whether or not MC-like effects existed in an online context. In order to avoid a commonly encountered conceptual conflation of MC with mate poaching, all target individuals were described as single to signal availability; however, as MC has been demonstrated when the target and model were explicitly described as dating (for a discussion see Anderson & Surbey, 2020), future studies may wish to employ a similar methodology but present the targets as romantically associated.

When using social networking sites, the profile photograph is an important component of self-presentation, as it is one of the most obvious pieces of self-disclosure by which Facebook users choose to represent themselves (Hum et al., 2011). In reality, users often use pictures in which they appear more desirable, emphasising positive traits and omitting flaws (Strano, 2008). Evidence shows that, where

profile pictures are concerned, details such as smiling, being alone or with others, being outdoors or indoors, can influence the perceived attractiveness of the target individual, with attractiveness being greater for images that depicted the profile owner smiling or outdoors (Turner & Hunt, 2014). The highly artificial nature of the pictures that were used in the study may have failed to create a real social networking site impression, and neutral expression of target individuals may have been viewed suspiciously. In order to increase external validity, future studies may wish to employ more 'natural' looking stimuli (smiling etc.).

Another limitation of the study was the amount of information given to participants. Although they were given the total number of target's Facebook friends and the gender distribution of these friends, no other details were offered. The addition of details (e.g. specifying an age range of friends aligning with participant characteristics, aged between 18 and 35) may have helped in signalling desirability of target individuals by peers. Simply offering a minimal amount of information (unusual information) may have contributed to the perceived artificiality and consequent distrust of the profiles.

Facebook profiles typically contain status updates, posts on the wall, and cues on one's private and family life, and these are often updated depending on the changes in the profile owner's life. Additional information containing cues on one's relationships, economic status, and ideology can be used as measures of one's personality and resource holdings, or potential to acquire such. Not having any of these additional cues may have led to ambiguity about the genuineness of the profile and caused uncertainty about the target individuals' fit as a prospective partner. This underscores the need for naturalistic studies in this field. While the methodology employed in the current study somewhat reflects the fact that individuals are making mate choices based on less and less information these days, it is unclear whether mating preferences expressed in a contrived study are consistent with actual mate choices. In vivo research may clarify the issue, although we would speculate that there is a difference between making an anonymous selection in a low-cost research study and acting upon real world partner choices.

Research suggests that, while displaying one's number of virtual friends can be seen as a strategy for self-promotion (Scott & Ravenscroft, 2017), metrics such as the number of likes/shares one gets, how often their status is updated, and the number of wall posts they have from others can all be used as objective measures of one's social attractiveness. Future studies may benefit from using authentic-looking social networking profile pages that contain cues on virtual interactions and reflect the quality of one's online relationships, as they would indicate how popular one is with others. For studies which

investigate popularity and social attractiveness, making use of more objective measures of personality and online desirability, such as the number of interactions between a target individual and his/her online friends, or the type of comments they post and receive, may increase the reliability and external validity of findings.

**Author Contribution** All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed jointly. The first draft of the manuscript was written jointly, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

**Funding** This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. A minimal funding allocation was received from the Monash University GDP-A program.

**Data Availability** SPSS data file available at [https://osf.io/wmn9x/?view\\_only=441573dbecb04e99aede3a63888e73c4](https://osf.io/wmn9x/?view_only=441573dbecb04e99aede3a63888e73c4)

## Declarations

**Ethics Approval** This study received ethical approval from the Monash University Human Research Ethics Committee (approval number 22554)

**Consent to Participate** All participants in this study willingly consented to participate in this research (see above)

**Consent for Publication** Both authors of this manuscript hereby consent for it to be published

**Conflict of Interest** The authors declare no competing interests.

## References

- Anderson, R. C., & Surbey, M. K. (2014). I want what she's having. *Human Nature*, 25(3), 342–358. <https://doi.org/10.1007/s12110-014-9202-7>
- Anderson, R. C., & Surbey, M. K. (2020). Human mate copying as a form of nonindependent mate selection: Findings and considerations. *Evolutionary Behavioral Sciences*, 14(2), 173–196. <https://doi.org/10.1037/ebs0000151>
- Antheunis, M. L., Valkenburg, P. M., & Peter, J. (2012). The quality of online, offline, and mixed-mode friendships among users of a social networking site. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 6(3), 1–11. <https://doi.org/10.5817/CP2012-3-6>
- Bowers, R. I., Place, S. S., Todd, P. M., Penke, L., & Asendorpf, J. B. (2011). Generalization in mate-choice copying in humans. *Behavioral Ecology*, 23(1), 112–124. <https://doi.org/10.1093/beheco/arr164>
- Bressan, P., & Stranieri, D. (2008). The best men are (not always) already taken: Female preference for single versus attached males depends on conception risk. *Psychological Science*, 19(2), 145–151. <https://doi.org/10.1111/j.1467-9280.2008.02060.x>

- Buss, D. M., & Schmitt, D. H. (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>
- Buss, D. M., & Shackelford, T. K. (2008). Attractive women want it all: Good genes, economic investment, parenting proclivities, and emotional commitment. *Evolutionary Psychology*, *6*(1), 134–146. <https://doi.org/10.1177/147470490800600116>
- Dugatkin, L. A. (1992). Sexual selection and imitation: Females copy the mate choice of others. *The American Naturalist*, *139*(6), 1384–1389. <https://doi.org/10.1086/285392>
- Dunn, M. J., & Doria, M. V. (2010). Simulated attraction increases opposite sex attractiveness ratings in females but not males. *Journal of Social, Evolutionary, and Cultural Psychology*, *4*(1), 1–17. <https://doi.org/10.1037/h0099305>
- Finkel, E. J., Eastwick, P. W., Karney, B. R., Reis, H. T., & Sprecher, S. (2012). Online dating. *Psychological Science in the Public Interest*, *13*(1), 3–66. <https://doi.org/10.1177/1529100612436522>
- Gouda-Vossos, A., Nakagawa, S., Dixson, B. J. W., & Brooks, R. C. (2018). Mate choice copying in humans: A systematic review and meta-analysis. *Adaptive Human Behavior and Physiology*, *4*(4), 364–386. <https://doi.org/10.1007/s40750-018-0099-y>
- Grammer, K., Kruck, K., Juette, A., & Fink, B. (2000). Non-verbal behavior as courtship signals: The role of control and choice in selecting partners. *Evolution and Human Behavior*, *21*(6), 371–390. [https://doi.org/10.1016/S1090-5138\(00\)00053-2](https://doi.org/10.1016/S1090-5138(00)00053-2)
- Hill, S. E., & Buss, D. M. (2008). The mere presence of opposite-sex others on judgments of sexual and romantic desirability: Opposite effects for men and women. *Personality and Social Psychology Bulletin*, *34*(5), 635–647. <https://doi.org/10.1177/0146167207313728>
- Hum, N. J., Chamberlin, P. E., Hambright, B. L., Portwood, A. C., Schat, A. C., & Bevan, J. L. (2011). A picture is worth a thousand words: A content analysis of Facebook profile photographs. *Computers in Human Behaviour*, *27*(5), 1828–1833. <https://doi.org/10.1016/j.chb.2011.04.003>
- Jones, B. C., DeBruine, L. M., Little, A. C., Burriss, R. P., & Feinberg, D. R. (2007). Social transmission of face preferences among humans. *Proceedings of the Royal Society*, *274*(1611), 899–903. <https://doi.org/10.1098/rspb.2006.0205>
- Kavaliars, M., Matta, R., & Choleris, E. (2017). Mate-choice copying, social information processing, and the roles of oxytocin. *Neuroscience & Biobehavioral Reviews*, *72*(C), 232–242. <https://doi.org/10.1016/j.neubiorev.2016.12.003>
- Kim, J., LaRose, R., & Peng, W. (2009). Loneliness as the cause and the effect of problematic internet use: The relationship between internet use and psychological well-being. *Cyberpsychology and Behaviour*, *12*(4), 451–455. <https://doi.org/10.1089/cpb.2008.0327>
- Kim, J., & Lee, J. R. (2011). The Facebook paths to happiness: Effects of the number of Facebook friends and self-presentation on subjective well-being. *Cyberpsychology, Behaviour and Social Networking*, *14*(6), 359–364. <https://doi.org/10.1089/cyber.2010.0374>
- Kodric-Brown, A., & Brown, J. H. (1984). Truth in advertising: The kinds of traits favored by sexual selection. *The American Naturalist*, *124*(3), 309–323. <https://doi.org/10.1086/284275>
- Kuss, D. J., & Griffiths, M. D. (2011). Online social networking and addiction: A literature review of empirical research. *International Journal of Environmental and Public Health*, *8*(9), 3528–3552. <https://doi.org/10.3390/ijerph8093528>
- 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., Caldwell, C. A., Jones, B. C., & DeBruine, L. M. (2011). Effects of partner beauty on opposite-sex attractiveness judgments. *Archives of Sexual Behavior*, *40*(6), 1119–1127. <https://doi.org/10.1007/s10508-011-9806-5>
- Ma, D. S., Correll, J., & Wittenbrink, B. (2015). The Chicago face database: A free stimulus set of faces and norming data. *Behavior Research Methods*, *47*(4), 1122–1135. <https://doi.org/10.3758/s13428-014-0532-5>
- Mehdizadeh, S. (2010). Self-presentation 2.0: Narcissism and self-esteem on Facebook. *Cyberpsychology, Behaviour and Social Networking*, *13*(4), 357–364. <https://doi.org/10.1089/cyber.2009.0257>
- Moorman, J., & Bowker, A. (2011). The university Facebook experience: The role of social networking on the quality of interpersonal relationships. *The American Association of Behavioural and Social Sciences Journal*, *15*, 1–23. <https://www.researchgate.net/publication/267856845>
- Petersen, J. L., & Hyde, J. S. (2011). Gender differences in sexual attitudes and behaviours: A review of meta-analytic results and large datasets. *Journal of Sex Research*, *48*(2–3), 149–165. <https://doi.org/10.1080/00224499.2011.551851>
- 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>
- Rodeheffer, C. D., Leyva, R. P. P., & Hill, S. E. (2016). Attractive female romantic partners provide a proxy for unobservable male qualities: The when and why behind human female mate choice copying. *Evolutionary Psychology*, *14*(2), 1–8. <https://doi.org/10.1177/1474704916652144>
- Scott, G. G. (2014). More than friends: Popularity on Facebook and its role in impression formation. *Journal of Computer-Mediated Communication*, *19*(3), 358–372. <https://doi.org/10.1111/jcc4.12067>
- Scott, G. G., & Ravenscroft, K. (2017). Bragging on Facebook: The interaction of content source and focus in online impression formation. *Cyberpsychology, Behaviour and Social Networking*, *20*(1), 58–63. <https://doi.org/10.1089/cyber.2016.0311>
- Sigall, H., & Landy, D. (1973). Radiating beauty: Effects of having a physically attractive partner on person perception. *Journal of Personality & Social Psychology*, *28*(2), 218–224. <https://doi.org/10.1037/h0035740>
- Stopfer, J. M., Egloff, B., Nestler, S., & Back, M. D. (2013). Being popular in online social networks: How agentic, communal, and creativity traits relate to judgments of status and liking. *Journal of Research in Personality*, *47*(5), 592–598. <https://doi.org/10.1016/j.jrp.2013.05.005>
- Strano, M. M. (2008). User descriptions and interpretations of self-presentation through Facebook profile images. *Psychosocial Research on Cyberspace*, *2*(2), 1–11. <https://cyberpsychology.eu/article/view/4212/3253>
- Tong, S. T., Van Der Heide, B., Langwell, L., & Walther, J. B. (2008). Too much of a good thing? The relationship between number of friends and interpersonal impressions on Facebook. *Journal of Computer-Mediated Communication*, *13*(3), 531–549. <https://doi.org/10.1111/j.1083-6101.2008.00409.x>
- Turner, M., & Hunt, N. (2014). What does your profile picture say about you? The accuracy of thin-slice personality judgments from social networking sites made at zero acquaintance. In Meiselwitz G. (Eds.), *Social computing and social media: SCSM 2014* (pp. 506–516). Lecture Notes in Computer Science, vol 8531. Springer, Cham. [https://doi.org/10.1007/978-3-319-07632-4\\_48](https://doi.org/10.1007/978-3-319-07632-4_48)
- Vakirtzis, A. (2011). Mate choice copying and non-independent mate choice: A critical review. *Annales Zoologici Fennici*, *48*(2), 91–107. <https://doi.org/10.5735/086.048.0202>
- Vakirtzis, A., & Roberts, S. C. (2010). Non-independent mate choice in monogamy. *Behavioral Ecology*, *21*(5), 898–901. <https://doi.org/10.1093/beheco/arq092>
- Waynforth, D. (2007). Mate choice copying in humans. *Human Nature*, *18*(3), 264–271. <https://doi.org/10.1007/s12110-007-9004-2>

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.