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RESEARCH ARTICLE

Female Mate Copying: Measuring the Effect of Mate-Relevant Information Provided by Former Partners

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Abstract

One of the most important decisions an individual can make is to invest in a relationship. For women, the process of mate selection can be time-intensive, and fraught with costs and dangers. However, these risks can be minimised by modelling the mate choices of others. The propensity to imitate another's mate choices is referred to as mate copying. Most research has focused on this behaviour in nonhumans, but evidence of its existence in humans is emerging. In the current study, 750 women evaluated men's desirability based on vignettes containing information provided by men's former partners. A man's desirability was enhanced in the presence of positive cues (i.e. when he was described as a "good" partner and his former relationship ended mutually). In contrast, a man's desirability diminished in the presence of negative cues (i.e. when he was described as a "bad" partner and/or his former relationship breakup was female initiated). Overall, the current study adds to the existing body of knowledge on mate copying by demonstrating how females incorporate social learning and innate evolutionary drives to facilitate decision-making and behaviour relating to mate selection.

Keywords Mate copying · Mate-avoidance · Mate-relevant information · Mate choice · Social information

Finding a mate is one of the most important decisions an individual will make. The process of mate selection can be risky, resource-intensive, and may be undertaken several times throughout one's life (Wade and Pruett-Jones 1990). Using social cues when evaluating a potential mate may minimise these costs (Candolin 2003). Humans are highly social beings, and their mating decisions are often influenced by the mating choices of others (Graziano et al. 1993; Platek et al. 2001; Street et al. 2018; Waynforth 2007). Humans (and some other species) have been observed to imitate the mate choices of others, in a process known as mate copying. Considered a form of social learning, mate copying refers to the probability of being chosen as a mate depending on prior displays of mating success. Essentially, prior selection or rejection as a mate respectively increases or decreases one's chance of future mate selection (Pruett-Jones 1992). Mate copying was first observed in nonhumans, but in recent decades, evidence has emerged of its existence in humans (Anderson and Surbey 2018; Gouda-Vossos et al. 2018; Vakritzis 2011). However, research on human mate copying is sparse, and is characterised by theoretical and methodological inconsistencies (Anderson and Surbey 2018).

Highlights • Humans sometimes use a strategy known as "mate copying" to determine someone's suitability as a partner
• We show that women are highly attentive to negative cues from about men
• Women dislike men described as "bad" by a former partner
• Women also dislike men who have experienced a female-initiated breakup

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Why Do Women Mate Copy?

Although there are a lot of similarities between what men and women seek in a partner, women are typically more discerning when selecting a mate (Kirkpatrick 1982). Thus, it is important for them to gather a considerable amount of information about a potential mate before entering into a relationship. Typically, women prefer a mate who is in good health, possesses culturally valuable resources and social influence, and is committed to investing in his mate and offspring (Buss and Shackelford 2008). Selecting a mate of high genetic quality

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has inherent evolutionary advantages, as it optimises the genetic fitness of direct offspring and future generations (Geary 2006; Hunt et al. 2004). However, these preferred male traits are difficult to discern through observation alone. Unlike in animal species, among the human species, physical appearance is a poor indicator of a man's mate quality (Bowers et al. 2011). Thus, in the absence of directly observable cues, females may rely on more indirect cues of mate value (Uller and Johansson 2003).

With a relatively short reproductive career, females can save valuable time and resources by relying on mate-relevant cues from their female peers, rather than evaluating each potential mate firsthand (Hill and Buss 2008). Selecting a mate through means such as dating can be time-consuming and resource-intensive (Wade and Pruett-Jones 1990), and can pose risks, including harassment from rejected mates and exposure to sexually transmitted pathogens (Reynolds and Gross 1990). Rather than evaluating each potential mate firsthand, women can save valuable time and resources by relying on more indirect cues of mate value from their female peers (Hill and Buss 2008; Uller and Johansson 2003). Prior selection as a mate indicates that the man possesses some unobservable desirable qualities (Waynforth 2007). Essentially, women who have previously selected a mate are perceived to be endorsing him as a quality mate (Nordell and Valone 1998). Overall, mate copying is a means of minimising costs and risks associated with mate selection (Rodeheffer et al. 2016), and thus may have evolved as a cost-avoidance heuristic (Little et al. 2011). However, there is evidence that women copy attractiveness ratings of both potential partners and abstract art (Street et al. 2018). As such, it is unclear whether mate copying evolved as a domain-specific adaptation or is simply a consequence of a broader domain-general adaptation that developed to facilitate social learning.

Model Presence

A commonly used methodology in human mate copying research involves presenting photographs of opposite-sex individuals (hereafter referred to the "target") to participants (i.e. "observers"). The target is presented either on their own, or alongside one or more opposite-sex individuals (i.e. the "model"), and participants are asked to rate their desirability. In one study, men and women were presented with photographs of opposite-sex targets who were either alone, or surrounded by same-sex and opposite-sex models (Hill and Buss 2008). Women rated male targets as more desirable as a sexual partner and long-term partner when merely surrounded by women compared with when shown alone or with other men, with the opposite effect for male participants. Research indicates that men view their male peers as mating competitors, whereas women view their female peers as models for decision-making (Hill and Buss 2008). These findings suggest that men and women have evolved to possess innately distinct mating needs, which has consequently led to gender-based mate preferences.

Mate Avoidance

Investigating the phenomenon among nonhumans, Pruett-Jones (1992) suggested that the probability of mate copying decreases if the target is observed to be rejected by a same-sex individual (Pruett-Jones 1992). Lewandowski et al. (2007) found that target males shown in photographs were perceived as less attractive and desirable when described in negative terms, compared with positive or neutral terms. The authors concluded that women are highly attuned to the valence of mate-relevant cues. Desired male traits are rarely perceptible at first sight, but they may be sensed through social cues. For instance, photographs of target men observed by female models with a negative facial expression are perceived as undesirable (Chu 2012; Jones et al. 2007). Negative social cues may suggest that a man possesses some unobservable traits that are undesirable in a mate. Similarly, being in the presence of an unattractive model female has a desirability diminishing effect for target males (Vakirtzis and Roberts 2010; Waynforth 2007). Considering the aforementioned association between attractiveness and social status, these men may be perceived as less prestigious and, thus, less desirable as a mate. Consequently, negative mate-relevant cues are linked to mate avoidance behaviours.

Mate Rejection

Explicit knowledge of mate rejection can also influence avoidance behaviours. For instance, research employing videos of simulated speed dating scenarios has demonstrated that negative interactions with model females reduce men's perceived desirability among women (Bowers et al. 2011; Place et al. 2010). Related research has found that women are quick to revise their positive evaluations of target males upon learning that he was previously rejected by a former partner (Anderson and Surbey 2014; Stanik 2009). This effect appears to be stronger for single, compared with coupled, women (Deng and Zheng 2015). These findings suggest that women are highly attuned to cues of prior mate rejection, and the attentional bias is heightened when a woman is potentially seeking a mate. This supports the evolutionary theory of mate copying as a cost-avoidance strategy (Little et al. 2011). Essentially, copying mate rejection is equally, if not more imperative, than positive mate copying.

Research Aims and Hypotheses

The aim of the current study was to measure the effects of positive and negative mate-relevant cues on mate copying behaviour. As much of the previous literature has focused on mate copying among women, particularly in terms of mate copying for long-term relationships, the current study will focus on female participants. It was hypothesised that a man's desirability would increase when they were described by their former-partner in positive terms (i.e. he was a "good" partner), but it would decrease when they were described negatively by a former partner (i.e. he was a "bad" partner). Further, it was hypothesised that men rejected by a former partner (female-initiated breakup) would be less desirable than men whose breakup was mutual.

Method

Participants

The sample comprised 750 female respondents between the ages of 18–45 ($M = 24.74$ years, SD = 6.49 years) recruited via social media. The majority of participants identified as heterosexual (72.8%), and were either in a relationship (45.6%), or single (41.9%). The sample was ethnically diverse, with participants of European heritage (68%) representing the largest proportion. Participants were recruited globally, with most residing in Australia (41.1%), closely followed by the USA (33.1%).

Materials and Procedure

Mate Copying Survey The survey design was based on previous measures of human mate copying, and employed photographs of target males alongside text conveying mate-relevant information. Photographs were obtained from the Chicago Face Database (Ma et al. 2015). The four male photographs selected for use in the current study had been pre-rated as comparable on dimensions of attractiveness, age, and ethnicity by a large ethnically diverse sample of men and women ($N = 1087$). None of these participants took part in the current study.

After responding to generic demographic questions, participants were initially presented with vignettes of each of the four target men consisting of a standardised facial photograph alongside brief neutral introductory text (e.g. "this is Dean. Dean works in HR, likes to read and enjoys travel"). Participants sequentially rated the desirability (as a long-term partner) of each man on a 7-point Likert scale (time 1), before completing a filler task and then being shown and re-rating each of the four men (time 2). In this second iteration, mate-relevant information was provided by the man's former-partner ("he was a good/bad partner" and "their breakup was mutual/she initiated their breakup"). The filler task lasted between 2 and 6 min (depending on how quickly the participant did the task). This task was somewhat cognitively demanding, but importantly, involved making ratings and viewing similar stimuli, so it would have provided participants with adequate opportunity to forget or misremember their original evaluations.

Design

This study adopted a within-subject design. There were two levels of each of the two independent variables (*description of partner*: good/bad; and *breakup*: mutual/female-initiated). The dependent variable here was the *change* in desirability as a long-term partner (time 2 − time 1).

Results

Preliminary Testing and Descriptive Statistics

Whilst the four male stimulus photographs were chosen on the basis that they had been pre-rated as equivalent in attractiveness previously by a large sample ($N = 1087$; Ma et al. 2015), the man presented in the good partner, female break-up condition was rated by the current sample ($N = 750$) as being more attractive ($M = 4.50$, SD = 1.35). However, this attractiveness did not correlate with his change in desirability from time 1 to time 2, ($p = .58$), compared with the men presented in the good partner, mutual break-up condition ($M = 3.51$, SD = 1.20), bad partner, mutual break-up condition ($M = 3.57$, SD = 1.24) or bad partner, female break-up condition ($M = 3.73$, SD = 1.37). The difference in ratings was statistically significant, $F(3, 2247) = 143.22$, $p < .001$, $\eta^2 = .16$.

Changes in desirability (time 2 − time 1) were calculated for each of the four target men and are presented in Table 1 below. Here a negative number indicates that a man has decreased in desirability with the addition of information from his most recent former partner, whilst a positive number indicates an increase.

Table 1 Means (SD) changes in desirability (time 2 − time 1)

	Breakup source		
Partner evaluation	Mutual	Female-initiated	Total
Good	.80 (1.13)	− .05 (.99)	.38 (.79)
Bad	− 1.14 (1.32)	− 1.31 (1.31)	− 1.23 (1.10)
Total	− .17 (.79)	− .68 (.82)	.43 (.63)

As can be seen in the table above, a man's desirability decreased when a former partner described him as a "bad" partner or when she initiated the relationship breakup. His desirability increased when he was described by a former partner as a "good" partner and the relationship breakup was mutual.

Inferential Statistics

A two-way within-subject ANOVA was conducted to explore the impact of partner evaluation ("he was a good partner" vs. "he was a bad partner") and breakup responsibility ("the breakup was mutual" vs. "the breakup was female-initiated") on desirability. There were statistically significant effects of both partner evaluation, $F(1,749) = 904.73$, $p < .001$, $\eta_p^2 = .55$, and breakup responsibility, $F(1, 749) = 201.66$, $\eta_p^2 = .21$. Additionally, a small but statistically significant interaction between the variables was detected, $F(1, 749) = 86.13$, $p < .001$, $\eta_p^2 = .10$.

The results of the simple effects analysis indicated that when men were described as being "good" partners, their desirability increased if their last breakup was mutual but decreased if it was female-initiated, $F(1,749) = 278.03$, $p < .001$, $\eta^2 = .27$. When men were described as being "bad" partners, their desirability decreased more if their last breakup was female-initiated than if it was mutual, $F(1,749) = 10.83$, $p = .001$, $\eta^2 = .01$.

Among men whose last breakup was mutual, desirability increased when he was described as a "good" partner but decreased when he was described as a "bad" partner, $F(1,749) = 799.43$, $p < .001$, $\eta^2 = .52$. When the breakup was female-initiated, desirability always decreased but more so when he was described as a "bad" partner than "good", $F(1,749) = 437.65$, $p < .001$, $\eta^2 = .37$.

Discussion

The hypothesis that male desirability would increase when target males were described positively by their former female partner was supported. Compared with when men were initially rated with neutral information, the addition of positive information (as offered by a former partner) *increased* their desirability as a long-term partner whereas negative information *decreased* it. Furthermore, rejection by a former partner (female-initiated breakup) decreased a man's desirability considerably.

Implications of the Current Study

Positive Cues Enhance Mate Copying As predicted, positive mate-relevant cues had a desirability enhancing effect. Positive former-partner evaluations, wherein target males were described as a "good" partner, had a large effect on perceived desirability. This finding is consistent with social learning theory, which suggests that women are influenced by the attitudes and beliefs of their female peers, particularly in determining interpersonal attraction (Dunn and Dorian 2010; Graziano et al. 1993). The propensity to recognise and copy social cues from same-sex peers is well developed by adulthood, with research showing that children emulate same-sex peers as a means of gender identity development (Tobin et al. 2010). In adulthood, mate choice is one of the most significant decisions a woman will make, thus she would be well advised to attend to reliable and informative social cues. It is reasonable to infer that a man's former partner has invested time and resources into their relationship, and is therefore a compelling judge of his mate value. A positive evaluation from a former partner is a fairly direct endorsement, signalling that he has been "pre-approved" as a quality partner. Positive cues from one's female peers serve as a useful decision-making heuristic, reducing the time and effort required to differentiate and evaluate potential mates before choosing the most appropriate one (Rodeheffer et al. 2016). Overall, this finding indicates that explicit positive cues from a former partner are both influential and important in determining mate quality.

Desirability enhancement effects were also evident when it was disclosed that the target male's prior relationship ended mutually (compared with the breakup being female-initiated). The effect of breakup source on desirability was not as large as the effect of former partner-evaluations, but both were considerable. This finding is consistent with prior research, which indicates that break-up accountability has a moderating effect on mate copying behaviour (Perilloux and Buss 2008; Stanik 2009). The association between breakup and male desirability could be attributed to a number of factors. First, prior relationship experience appears to enhance mate value, in that simply having prior experience is preferable to no experience, regardless of the outcome (Anderson 2018). Second, it appears that mutual dissolution of a relationship has positive implications for those involved. Specifically, it may be a sign of compassion (Sprecher et al. 2010), self-assurance (Doering 2010), emotional adjustment and secure attachment (Collins and Gillath 2012; Fagundes 2012). Those involved in a mutual break-up are more likely to have utilised adaptive coping mechanisms, and to emerge as relatively well-adjusted post break-up (Norona et al. 2017). Men whose prior relationship ended mutually are perceived as desirable, and this may be due to the implicit cues of positive character traits, psychological well-being and a healthy disengagement from their former partner. The current study adds to prior research by producing novel interaction effects, which demonstrate how certain factors interact to influence perceived desirability of a potential male partner. Women are highly attuned to positive mate-relevant cues, which denote unobservable yet desirable mate qualities. The observed desirability enhancement effect is indicative of mate copying behaviour.

Negative Cues Encourage Mate Avoidance As predicted, negative mate-relevant cues had a desirability diminution effect. Desirability ratings decreased when the target male was described as a "bad" partner. This finding is consistent with prior research, which suggests that women are inclined to attend to negative mate-relevant cues (Hill and Buss 2008; Jones et al. 2007; Vakiritzis and Roberts 2009). The finding can be understood as an expression of negativity bias, whereby humans are subconsciously predisposed to attend and be influenced by negative information over positive or neutral information (Rosin and Royzman 2001). Being labelled a "bad partner" by a former partner is a fairly explicit cue, which loudly cautions of the man's poor mate value, and reasonably diminishes his perceived desirability. The value of negative mate-relevant cues is evident from an evolutionary perspective, whereby attending to negative cues serves an adaptive function by minimising costs and risks (Rodeheffer et al. 2016).

Desirability diminution effects were also evident when it was disclosed that the target male's prior relationship was ended by his former partner (an indication of romantic rejection). As with positive mate-relevant information, negative cues of breakup source had a smaller, but nonetheless significant effect on desirability, thus supporting the second hypothesis. This result supports previous research findings, suggesting that men who have previously been rejected are perceived to be less desirable as a potential partner (Anderson 2018; Stanik 2009). It may signal that he possesses some unobservable negative traits which caused his partner to reject him. Being rejected is highly distressing for any person, and may have negative consequences (Field et al. 2010). For instance, being rejected in a relationship can trigger negative psychological sequelae, including emotional instability (Norona et al. 2017), low self-esteem and depression (Collins and Gillath 2012). It is also possible that the rejected mate has not adjusted post-breakup, and continues to have unresolved feelings towards their former partner. This can manifest as a tendency to continue directing attachment needs to the former partner (Fagundes 2012). It would be reasonable to anticipate issues in subsequent relationships as a result (Stewart and Harkness 2015). As a result of these physical and psychological consequences, being rejected in a relationship can also have negative social outcomes, including social demotion and isolation (Doering 2010). Consistent with the evolutionary perspective, a man's mate value is defined in part by his access to social resources and stability (Buss and Shackelford 2008). Thus, women are understandably inclined to avoid rejected mates.

Strengths of the Current Study

Overcoming Prior Research Limitations The current study is strengthened by overcoming some limitations of prior research. For instance, desirability has typically been evaluated by measuring target male attractiveness (e.g. Uller and Johansson 2003; Vakiritzis and Roberts 2012). However, the link between attractiveness and relationship interest has not been well established. To overcome this limitation, the current study measured desirability by explicitly asking participants to rate their interest in target men for a long-term relationship. Another limitation of prior research has been the tendency to present target men alongside their current partner (e.g. Little et al. 2008; Little et al. 2011). Rather than measuring mate copying, these studies may instead be measuring a completely different construct: mate poaching (Schmitt and Buss 2001). Mate poaching refers to the act of "stealing" another individual's romantic partner, and is considered to be socially undesirable within monogamous societies (De La Croix and Mariani 2015; Vakiritzis and Roberts 2012). To overcome this limitation, the current study presented single target men, alongside information sourced from female *former* partners. Taken together, these adjustments increase the face validity of this study.

Validating the Original Definition of Mate Copying The results of the current study are consistent with the definition of mate copying offered by Pruett-Jones (1992), whereby prior selection or rejection as a mate respectively increased or decreased one's likelihood of future mate selection. There was an association between positive mate-relevant cues and desirability, representing (positive) mate copying. In contrast, there was also an association between cues of mate rejection (i.e. female-initiated breakup) and desirability, representing mate avoidance behaviour (negative mate copying). Consistent with mate copying theory, female participants demonstrated a propensity for both mate copying and mate avoidance when presented with positive and negative social cues respectively. Whilst these and other results are significant and novel, they must be interpreted with consideration of the study limitations. The novel interaction effects added to this finding, indicating that desirability varies as a function of a factor of combined mate-relevant cues.

Limitations and Recommendations

Design Ecological restrictions necessitated the use of static stimuli (photographs and text) in the current study. This is not ideal when measuring behavioural intentions. It may be preferable to measure such phenomenon in a setting that closely resembles real-life, whilst controlling for confounding variables where possible. This has been attempted in some studies, whereby participants have observed "live" speed-dating interactions as a means of assessing mate-relevant cues (Bowers et al. 2011; Place et al. 2010; Uller and Johansson 2003). Related studies of human mate preferences have assessed interactions in more realistic settings, such as online dating sites (Li et al. 2013) and "bar-labs" (Van Straaten et al. 2008). Thus, future studies could study mate copying in a

semi-naturalistic setting, in order to increase reliability and validity.

Additionally, the current study did not employ a counterbalancing procedure (as the entire study took less than 15 minutes fatigue effects would be minimal, if any), and employed a within-subject design whereby participants evaluated all four target men twice. Future studies may wish to consider implementing a design whereby a single target man is accompanied by varying descriptions across between-subjects conditions.

Potential Attractiveness Confounds The photographic stimuli of target males were sourced from a public database, which provided pre-ratings on a number of variables. Photographs of men rated as comparable (and average) in attractiveness were selected. Although no differences were expected, results from the current study indicated that one target male was perceived to be more attractive than the others. Whilst the current results should be interpreted with some caution, this unexpected finding did not appear to have a noticeable effect on the results, with considerable effects found across all measures.

Although the nonequivalently attractive stimuli are of some concern, the inferential analyses in the current study were based on the *changes* in desirability from time 1 (no information) to time 2 (mate-relevant information added). The authors are not aware of any evidence that suggests male desirability (significantly) changes differentially as a function of initial physical attractiveness. Attractiveness scores of each man ranged from 3.51–4.50 out of 7, and so none were close to the extremes of the scale, thus the likelihood of ceiling/floor effects moderating the changes in desirability are minimal.

In addition to the above suggestion, future studies could minimise this potential confounding variable, possibly by randomly associating photographs with descriptions in a mixed-design study, or by avoiding the use of imagery (e.g. using text-based dating profiles).

Prior Relationship Information The current study presented a restricted range of mate-relevant information to participants. This may have been a limitation, as previous research suggests that the propensity for female mate copying varies as a function of quality and quantity of available mate-relevant cues. For instance, men who have had more than five relationships are perceived to be less desirable than men with fewer prior relationships (Anderson and Surbey 2014). These men may be judged as promiscuous, an undesirable trait linked to a number of risks to women, including exposure to aggression, pathogens, and sexual coercion (DeGue et al. 2010; Schaller 2011). Evidence also indicates that men who have had a recent break-up (1 month prior) are perceived as less desirable than men whose last relationship ended long ago (6–12 months prior) (Anderson 2018). In the absence of such details, participants in the current study may have made assumptions about the man's prior relationships. Alternatively, they may have felt they lacked adequate information to realistically determine their interest in target males. Too much information could cause participant fatigue and drop-out, and would be increasingly complex to analyse and interpret. Thus, future studies should strike a balance between presenting too little and too much information.

Cultural Considerations This study recruited a large, cross-cultural sample, which was both a strength and potential limitation. On the one hand, it meant that the results could be widely generalised. On the other hand, potential cultural factors were not explored. Conflicting evidence exists on the relationship between culture and mating preferences. There is evidence to suggest that mating preferences are similar across cultures (Lippa 2007; Shackelford et al. 2005). Yet, there is also evidence of cultural variations in mating preferences due to factors such as national health (DeBruine et al. 2010). Participant feedback indicated that some participants had a preference for men different to the Caucasian target males presented in the current study. It is worth noting that social learning, a central driver of mate copying, is culturally shaped and contributes to the development of an individual's values and beliefs (Molleman and Gächter 2018). The variables presented in the current study (mate evaluation and break-up source) were considered pertinent to mate value. However, this conclusion was based on prior research, most of which has been conducted with samples from western populations. Considering the complex interplay between culture and individual values, it is possible that the variables used in the current study were not equally important to this culturally diverse sample, and that the lack of cultural diversity of target men may have impacted perceived desirability. The relationship between culture and mate copying has not yet been adequately explored. Future research may wish to compare the phenomenon of mate copying across cultures, taking a more nuanced approach.

Future Research The current study has adopted a straightforward design that could be easily modified and replicated in future studies. It would be valuable to replicate this methodology, with some adjustments to the survey as per the aforementioned limitations. For instance, it would be important to control for potential confounding variables such as target male attractiveness. It may also be informative for future research to include a condition where the breakup was male-initiated, and possibly also when it was not initiated by either partner but by an external party (e.g. a parent) and imposed upon them against their will.

As the body of literature on human mate copying is still quite sparse, there are many questions yet to be answered. Future studies could add to the current knowledge base by investigating a number of variables. For instance, as

discussed, it would be valuable to examine the relationship between variables such culture, age, and romantic experience on mate copying propensity. Ultimately, humans are quite complex, and further research is required in order to understand the cognitive, social, behavioural and ecological factors that are associated with this phenomenon.

Research Implications

The results of the current study have broad implications. Knowledge that certain factors can either enhance or diminish desirability as a partner could be used in real life to promote successful dating. For instance, the concept of "wing-men" is well ingrained in popular culture, and even in research (Grazian 2011). The current finding that positive cues from women enhance desirability suggest that perhaps men would be better off bringing a "wing-woman" along in their pursuit of romance and intimacy. Alternatively, including a positive recommendation from a former partner could enhance a man's online dating profile. The results also suggest that women may benefit from attending to their female peer's evaluations of mate quality. For instance, they may be more successful in dating a man who is recommended by a friend or female peer who has previously dated the man in question. The findings may also have implications for psychologists and other counsellors treating clients experiencing issues relating to dating and romance. Understanding what promotes and prevents dating success could be used as an adjunct to approaches such as relational counselling (Duffey and Haberstroh 2014) to increase insight and promote successful engagement with women. The results also suggest that clinicians should be aware of the psychological and social impacts of mate rejection. For male clients presenting with issues around mate rejection, it would be beneficial to work towards developing resilience and positive connections with women to promote recovery. As romantic relationships and attachment are sought by most adults, information that can promote their success is relevant to many people.

Novelty and Conclusion

Whilst the body of literature concerning the phenomenon of human mate copying is growing, there has been very little work specifically examining the negative dimension of mate copying. The current study is novel in that it provides support for the original theory of mate copying, whereby prior selection or rejection as a mate respectively increased or decreased one's likelihood of future mate selection (Pruett-Jones 1992). In the current study, the original theory of mate-copying is supported as female participants demonstrated a propensity for both mate copying and mate avoidance when presented with positive and negative social cues respectively. Additionally, the current study overcomes some methodological concerns of previous research whereby (a) desirability has typically been evaluated by measuring target male *attractiveness* (e.g. Uller and Johansson 2003; Vakiritzis and Roberts 2012), and (b) prior research has frequently presented target males alongside their current partner and has thus potentially measured mate-poaching rather than mate copying (e.g. Little et al. 2008; Little et al. 2011).

The findings of the current study indicate that women are attentive to social cues from female peers when evaluating and selecting a potential mate. Positive cues increase the probability of mate copying, whilst negative cues decrease this probability. Similarly, cues of prior mate rejection increase the likelihood of mate avoidance. Mate-relevant cues from a man's former partner, particularly their own assessment of his mate quality, are particularly influential. Information on previous relationship dissolution (i.e. identifying the responsible party) provides supplementary information that helps to discriminate between potential mates. Overall, this study provides contributes to our developing knowledge on the complexities of human mate copying.

Data Availability The data associated with this research are available at https://osf.io/dhm53/?view_only=ba51e422ea86485d9a93d0afb52a81b2

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

References

Anderson, R. C. (2018). Mate copying and the effects of sexual history on romantic desirability. *Evolutionary Psychological Science, 4*, 1–9. https://doi.org/10.1007/s40806-018-0143-y.

Anderson, R. C., & Surbey, M. K. (2014). I want what she's having: Evidence for human mate copying. *Human Nature, 25*, 342–358. https://doi.org/10.1007/s12110-014-9202-7.

Anderson, R. C., & Surbey, M. K. (2018). Human mate copying as a form of nonindependent mate selection: Findings and considerations. *Evolutionary Behavioral Sciences, 14*, 173–196. https://doi.org/10.1037/ebs0000151.

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*, 112–124. https://doi.org/10.1093/beheco/arr164.

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. https://doi.org/10.1177/147470490800600116.

Candolin, U. (2003). The use of multiple cues in mate choice. *Biological Reviews, 78*, 575–595. https://doi.org/10.1017/S1464793103006158.

Chu, S. (2012). I like who you like, but only if I like you: Female character affects matechoice copying. *Personality and Individual Differences, 52*, 691–695. https://doi.org/10.1016/j.paid.2011.12.029.

Collins, T. J., & Gillath, O. (2012). Attachment, breakup strategies, and associated outcomes: The effects of security enhancement on the

selection of breakup strategies. *Journal of Research in Personality, 46*, 210–222. https://doi.org/10.1016/j.rp.2012.01.008.

De La Croix, D., & Mariani, F. (2015). From polygyny to serial monogamy: A unified theory of marriage institutions. *Review of Economic Studies, 82*, 565–607. https://doi.org/10.1093/restud/rdv001.

DeBruine, L. M., Jones, B. C., Crawford, J. R., Welling, L. L. M., & Little, A. C. (2010). The health of a nation predicts their mate preferences: Cross-cultural variation in women's preferences for masculinised male faces. *Proceedings of the Royal Society B: Biological Sciences, 277*, 2405–2410. https://doi.org/10.1098/rspb.2009.2184.

DeGue, S., DiLillo, D., & Scalora, M. (2010). Are all perpetrators alike? Comparing risk factors for sexual coercion and aggression. *Sexual Abuse: A Journal of Research and treatment, 22*, 402–426. https://doi.org/10.1177/1079063210372140.

Deng, Y., & Zheng, Y. (2015). Mate-choice copying in single and coupled women: The influence of mate acceptance and mate rejection decisions of other women. *Evolutionary Psychology, 13*, 89–105. https://doi.org/10.1177/147470491501300106.

Doering, J. (2010). Face, accounts, and schemes in the context of relationship breakups. *Symbolic Interaction, 33*, 71–95. https://doi.org/10.1525/si.2010.33.1.71.

Duffey, T., & Haberstroh, S. (2014). Developmental relational counseling: Applications for counseling men. *Journal of Counseling & Development, 92*, 104–113. https://doi.org/10.1002/j.1556-6676.2014.00136.x.

Dunn, M. J., & Dorian, 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.

Fagundes, C. P. (2012). Getting over you: Contributions of attachment theory for postbreakup emotional adjustment. *Personal Relationships, 19*, 37–50. https://doi.org/10.1111/j.1475-6811.2010.01336.x.

Field, T., Diego, M., Pelaez, M., Deeds, O., & Delgado, J. (2010). Breakup distress and loss of intimacy in university students. *Psychology, 1*, 173–177. https://doi.org/10.4236/psych.2010.13023.

Geary, D. C. (2006). Sexual selection and the evolution of human sex differences. *Psychological Topics, 15*, 203–238.

Gouda-Vossos, A., Nakagawa, S., Dixson, B. J., & 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.

Grazian, D. (2011). The girl hunt: Urban nightlife and the performance of masculinity as a collective activity. *Symbolic Interaction, 30*, 221–243. https://doi.org/10.1525/si.2007.30.2.221.

Graziano, W. G., Jensen-Campbell, L. A., Shebliske, L. J., & Lundgren, S. R. (1993). Social influence, sex differences, and judgements of beauty: Putting the interpersonal back into interpersonal attraction. *Journal of Personality and Social Psychology, 65*, 522–531. https://doi.org/10.1037/0022-3514.65.3.522.

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*, 635–647. https://doi.org/10.1177/0146167207313728.

Hunt, J., Bussière, L. F., Jennions, M. D., & Brooks, R. (2004). What is genetic quality? *Trends in Ecology & Evolution, 19*, 329–333. https://doi.org/10.1016/j.tree.2004.03.035.

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 B: Biological Sciences, 274*(1611), 899–903. https://doi.org/10.1098/rspb.2006.0205.

Kirkpatrick, M. (1982). Sexual selection and the evolution of female choice. *Evolution, 36*, 1–12. https://doi.org/10.1098/rspb.2006.0205.

Lewandowski, G. W., Aron, A., & Gee, J. (2007). Personality goes a long way: The malleability of opposite-sex physical attractiveness. *Personal Relationships, 14*, 571–585. https://doi.org/10.1111/j.1475-6811.2007.00172.x.

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*, 757–776. https://doi.org/10.1037/a0033777.

Lippa, R. A. (2007). The preferred traits of mates in a cross-national study of heterosexual and homosexual men and women: An examination of biological and cultural influences. *Archives of Sexual Behavior, 36*, 193–208. https://doi.org/10.1007/s10508-006-9151-2.

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., DeBruine, L. M., & Caldwell, C. A. (2011). Social learning and human mate preferences: A potential mechanism for generating and maintaining between-population diversity in attraction. *Philosophical Transactions of the Royal Society, 366*(1563), 366–375. https://doi.org/10.1098/rstb.2010.0192.

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*, 1122–1135. https://doi.org/10.3758/s13428-014-0532-5.

Molleman, L., & Gächter, S. (2018). Societal background influences social learning in cooperative decision making. *Evolution and Human Behavior, 39*, 547–555. https://doi.org/10.1016/j.evolhumbehav.2018.05.007.

Nordell, S. E., & Valone, T. J. (1998). Mate choice copying as public information. *Ecology Letters, 1*(2), 74–76. https://doi.org/10.1046/j.1461-0248.1998.00025.x.

Norona, J. C., Olmstead, S. B., & Welsh, D. P. (2017). Breaking up in emerging adulthood: A developmental perspective of relationship dissolution. *Emerging Adulthood, 5*, 116–127. https://doi.org/10.1172/2167696816658585.

Perilloux, C., & Buss, D. M. (2008). Breaking up romantic relationships: Costs experiences and coping strategies deployed. *Evolutionary Psychology, 6*, 164–181. https://doi.org/10.1177/1470490800600119.

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*, 320–325. https://doi.org/10.1016/j.evolhumbehav.2010.02.001.

Platek, S. M., Burch, R. L., & Gallup, G. G. (2001). The reproductive priming effect. *Social Behavior and Personality: An International Journal, 29*, 245–248. https://doi.org/10.2224/sbp.2001.29.3.245.

Pruett-Jones, S. (1992). Independent versus nonindependent mate choice: Do females copy each other? *The American Naturalist, 140*, 1000–1009. https://doi.org/10.1086/285452.

Reynolds, J. D., & Gross, M. R. (1990). Costs and benefits of female mate choice: Is there a lek paradox? *The American Naturalist, 136*, 230–243.

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, April–June, 1–8. https://doi.org/10.1177/1474704916652144

Rosin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review, 5*, 296–320. https://doi.org/10.1207/S15327957PSPR0504_2.

Schaller, M. (2011). The behavioural immune system and the psychology of human sociality. *Philosophical Transactions of the Royal Society, B: Biological Sciences, 366*, 3418–3426. https://doi.org/10.1098/rstb.2011.0029.

Schmitt, D. P., & Buss, D. M. (2001). Human mate poaching: Tactics and temptations for infiltrating existing mateships. *Journal of Personality and Social Psychology, 80*, 894–917. https://doi.org/10.1037//0022-3514.80.6.894.

Shackelford, T. K., Schmitt, D. P., & Buss, D. M. (2005). Universal dimensions of human mate preferences. *Personality and Individual Differences, 39*, 447–458. https://doi.org/10.1016/p.paid.2005.01.023.

Sprecher, S., Zimmerman, C., & Abrahams, E. M. (2010). Choosing compassionate strategies to end a relationship: Effects of compassionate love for partner and the reason for the breakup. *Social Psychology, 41*, 66–75. https://doi.org/10.1027/1864-9335/a000010.

Stanik, C. E. (2009). *Romantic relationships: An examination of partner evaluation, women's mate preferences, and dynamics in long-term relationships* (unpublished doctoral dissertation). The University of Michigan, United States. Retrieved from https://deepblue.lib.umich.edu/bitstream/handle/2027.42/63867/cstanik_1.pdf?sequ ence=1&isAllowed=y.

Stewart, J. G., & Harkness, K. L. (2015). The interpersonal toxicity of excessive reassurance-seeking: Evidence from a longitudinal study of romantic relationships. *Journal of Social and Clinical Psychology, 34*, 392–401. https://doi.org/10.1521/jspc.2015.34.5.392.

Street, S. E., Morgan, T. J. H., Thornton, A., Brown, G. R., Laland, K. N., & Cross, C. P. (2018). Human mate-choice copying is domain-general social learning. *Scientific Reports, 8*(1715), 1715. https://doi.org/10.1038/s41598-018-19770-8.

Tobin, D. D., Menon, M., Menon, M., Spatta, B. C., Hodges, E. V., & Perry, D. G. (2010). The intrapsychics of gender: A model of self-socialization. *Psychological Review, 117*, 601–622. https://doi.org/10.1037/a0018936.

Uller, T., & Johansson, C. (2003). Human mate choice and the wedding ring effect: Are married men more attractive? *Human Nature, 14*(3), 267–276. https://doi.org/10.1007/s12110-003-1006-0.

Vakiritzis, A., & Roberts, S. C. (2009). Mate choice copying and mate quality bias: Different processes, different species. *Behavioral Ecology, 20*, 908–911. https://doi.org/10.1093/beheco/arp073.

Vakiritzis, A., & Roberts, S. C. (2012). Do women really like taken men? Results from a large questionnaire study. *Journal of Social, Evolutionary, and Cultural Psychology, 6*(1), 50–65. https://doi.org/10.1037/h0099225.

Vakirtzis, A., & Roberts, S. C. (2010). Mate quality bias: Sex differences in humans. *Annales Zoologici Fennici, 47*, 149–157. https://doi.org/10.5735/086.047.0208.

Vakritzis, A. (2011). Mate choice copying and nonindependent mate choice: A critical review. *Annales Zoologici Fennici, 48*, 91–107. https://doi.org/10.5735/086.048.0202.

Van Straaten, I., Engels, R. C. M. E., Finkenauer, C., & Holland, R. W. (2008). Sex differences in short-term mate preferences and behavioural mimicry: A seminaturalistic experiment. *Archives of Sexual Behavior, 37*, 902–911. https://doi.org/10.1007/s10508-007-9179-y.

Wade, M. J., & Pruett-Jones, S. G. (1990). Female copying increases the variance in male mating success. *Proceedings of the National Academy of Sciences, 87*, 5749–5753. https://doi.org/10.1073/pnas.87.15.5749.

Waynforth, D. (2007). Mate choice copying in humans. *Human Nature, 18*, 264–271. https://doi.org/10.1007/s12110-007-9004-2.