Attending to Social Information: What Makes Men Less Desirable

Ryan C. Anderson[1]

Abstract

Mate copying is a type of social influence whereby the desirability of a potential mate is modified as a result of being romantically chosen by an opposite-sex other. While research into mate copying typically focuses on how an individual's desirability can be raised by having a previous partner, it can also be lowered. Here we present two studies that look at how a previous partner can influence how one is romantically perceived. Study 1 presented women ($N=103$) with profiles of men alongside mate-relevant information offered by the former partners of the men, and had them rate the long-term desirability of the featured men. Using a similar methodology, Study 2 ($N=284$) varied who was providing the information. Study 1 found that a man's perceived desirability is lowered when a previous partner offers negative information about the relationship. Study 2 found that a man's perceived romantic desirability can be lowered depending on who his previous partner was and how long they were romantically associated for. It was concluded that relationship decisions about a prospective romantic partner are influenced by both implicit and explicit information provided by their former partners.

Keywords Mate copying · Mate-relevant information · Desirability · Former partners · Physical attractiveness

Introduction

What is Mate Copying?

Choosing a romantic partner is arguably one of the more important decisions a person will make in the course of their life. As sexual strategists, humans employ a

✉ Ryan C. Anderson
ryan.anderson1@my.jcu.edu.au

1 Department of Psychology, College of Healthcare Sciences, James Cook University, 1 University Drive, Douglas, QLD 4814, Australia

pluralistic repertoire, with serial monogamy one of the more popular, but not the only, strategies in which they engage (Gadoua & Larson, 2014). As such, the mate selection process is iterative and conducted a number of times throughout any given person's life. The consequences associated with romantically aligning with an opposite-sex other are considerable. One would be well-advised to at least take note of a number of sources of information.

Imitating the mating decisions made by others has been addressed by a number of authors (Cubitt et al., 1998; Dines & Humez, 2003; Hastie, 2001; Powell & Greenhaus, 2012). But copying the choices of others, or attending to the information they have to offer, may be considered a form of strategic nonindependent mate choice that evolved to reduce the costs of mate selection (by simply copying the choices of others—for a discussion see Anderson & Surbey, 2020). In broad terms mate copying, sometimes referred to as mate-choice copying, is a type of social influence referring to the idea that the romantic desirability of an individual can be modified depending upon their romantic history. The process of mate copying was initially described (and has been consistently documented among) among nonhuman taxa for reviews see Brown & Fawcett, 2005; Galef & Laland, 2005; Vakirtzis, 2011). In the past 15 years or so, zoological enquiry has persisted but there has additionally been a number of investigations examining mate copying among humans. While the phenomenon is often approached from an evolutionary psychological perspective, findings have clear implications for the fields of social psychology and behavioral science. Empirical investigation has thus far largely focused on women copying the choices of other women; however, there have been a limited number of demonstrations of mate copying among men (but see Little et al., 2008; Place et al., 2010).

Of concern in some previous studies addressing human mate copying is that the men to be evaluated are sometimes presented alongside a woman who is explicitly described as his *current* romantic partner or can be reasonably assumed to be so (Eva & Wood, 2006; Little et al., 2008, 2011; Uller & Johansson, 2003; Waynforth, 2007). Doing so may unintentionally confound the phenomenon of mate copying with the related, but socially undesirable, phenomenon of mate poaching (pursuing someone that is already in a romantic relationship; Parker & Burkley, 2009; Schmitt & Buss, 2001). To reduce or eliminate the potential effects of contraindications or social sanctions against desiring another person's current partner, some authors have explicitly described women as former (but not current) partners of the pictured men (Anderson & Surbey, 2014; Vakirtzis & Roberts, 2010; Yorzinski & Platt, 2010). The current research will employ this latter approach.

Why the Attractiveness of a Romantic Partner is Important

It is widely agreed that physical attractiveness is an important cue of female mate value (Penton-Voak et al., 2003; Singh, 2002; Sugiyama, 2004; Symons, 1995; Vakirtzis & Roberts, 2009). Men and women seek qualities in their romantic partners that reliably correlate with offspring production and survival. For men, fecundity, youthfulness and indications of health and genetic robustness—all encapsulated in physical beauty—are biologically important mate-relevant traits for

a woman to possess. It has been consistently found that physical beauty is one of the most highly valued characteristics in a female mate (Barber, 1995; Buss, 1989; Eastwick & Finkel, 2008; Wiederman, 1993). Therefore, the importance of physical beauty for women is considerable. Additionally, it has been suggested that the persuasiveness of a given message is influenced heavily by source characteristics (Chaiken, 1980; Pornpitakpan, 2004). There is evidence to suggest that one of the most important source characteristics in mate copying is the physical attractiveness of a female partner (Chu, 2012; Little et al., 2011; Vakirtzis & Roberts, 2009, 2010; Waynforth, 2007; Yorzinski & Platt, 2010). Female physical attractiveness is immediately discernible (can be easily assessed through a cursory visual observation) and is believed to be an honest and reliable indicator of genetic quality (Thornhill & Grammer, 1999).

Mate-Relevant Information Provided by Romantic Partners

Knowing the preferences of others can be helpful for making an informed decision. The opinions of experienced others are often sought when one is tasked with making an important decision (Cioffi, 2000; Polikar, 2006; Postmes et al., 2001). The phenomenon of mate copying can be considered a direct function of what can be assumed to be an honest endorsement. When a woman assesses the mate value of a currently or formerly partnered man higher than a man who lacks such relationship experience, she is, in a sense, attending to the positive social information implicitly offered by his female partner. By having selected a given man as a romantic partner, a woman is indicating that she considers him to be of an acceptable mate standard. In this sense, already mated men have been pre-approved or endorsed by their female partners. Mate copiers use this information to reduce costs of time and energy typically associated with trying to determine the suitability of a potential mate. While there have been demonstrations of mate copying both when men are *currently* partnered and when they have been *formerly* partnered but are currently single (for a discussion see Anderson & Surbey, 2020) it is reasonable to suggest that having been part of a relationship that did not work may reduce a man's desirability below that of a currently partnered man's. However, this has to be weighed against a number of other factors, for example, any implicit social proscriptions against coveting a partnered individual (Vakirtzis & Roberts, 2012). Additionally, Koranyi et al. (2013) suggest that for heterosexual individuals forming a positive attitude toward an opposite-sex other who is unlikely, unable or unwilling to invest in you (e.g. a partnered man/woman) can undermine a successful mate search.

Nuances such as that described above contribute to the idea that mate copying can be a rather context-dependent phenomenon, and is potentially by a multitude of factors (Anderson & Surbey, 2020). Studies investigating mate copying typically examine instances whereby the desirability of an individual is elevated by his/her previous relationship experience (Eva & Wood, 2006; O'Hagen et al., 2003; Rodeheffer et al., 2016; Uller & Johansson, 2003; Waynforth, 2007; Yorzinski & Platt, 2010). The general suggestion is that implicit positive information about someone (them having had a partner previously) can heighten a person's mate value. While

mate copying generally refers to the addition of a current or former partner resulting in an *increase* in a man's desirability (positive mate copying), there have also been demonstrations of negative information being offered by others leading to a *decrease* in one's mate value (negative mate copying). While the phenomenon of avoiding a potential mate for whatever reasons has been well documented (Gangestad & Buss, 1993; Grob et al., 1998; Ober et al., 1997; Shepher, 1971), the distinct concept of negative mate copying requires that a potential partner is pre-emptively rejected due to some kind of mate-relevant information (explicit or implicit) offered by an actual or potential partner of theirs.

Place et al. (2010) had both men and women view speed-dating footage of opposite-sex others. They found that while traditional mate copying effects were found for men observing women who had received positive attention from other men, female raters showed a pattern of mate avoidance when they perceived disinterest between the man and woman involved in the speed date. Specifically, they were less romantically attracted to men that were not positively attended to by women. The authors suggested that the specific gender effects of social information may be indicative of more general differences in mate choice, with women typically being more selective overall (Trivers, 1972) and possibly employing a quality assessment heuristic whereby negative model interest is attended as well as positive information (Vakirtzis & Roberts, 2009). Further, Cunningham et al. (Unpublished results) manipulated the personality profiles of men and women, supposedly based on information given by potential mates. The written profiles varied in the ratings given to individuals on the dimensions of peer attention (expressed willingness of others to date them) and physical attractiveness. Both positive and negative information about an individual's peer attention affected their perceived mate value (positively and negatively, respectively). Similarly, Scammel and Anderson (2020) presented women with profiles of men that had been described either positively or negatively by the former partners of the men. Consistent with the idea of mate copying, men who were explicitly endorsed by a former partner received a considerable increase in perceived desirability, but perhaps even more interestingly, the desirability of those described negatively was reduced (the magnitude of the reduction was greater than the magnitude of the increase).

Long-term and Short-term Relationship Considerations

Converging lines of evidence suggest that the characteristics most highly valued by women in a romantic partner vary as a function of the length of the relationship being sought (Cunningham et al., 1990; Jonason et al., 2012; Li & Kenrick, 2006). For long-term relationships, characteristics such as generosity and parental capacity are highly valued in a male partner (Scheib, 2001). For a short-term relationship, observable qualities such as height (Pawlowski & Jasienska, 2005) and masculinity (Little et al., 2002) are more highly valued. While it has been suggested that a gender asymmetry exists for what the sex's prize in a long-term mate (Li & Kenrick, 2006), both are particularly responsive to a mate's physical attractiveness in short-term relationships. This is typically accounted for in women by the strength of the

positive relationship that exists between physical attractiveness and (highly sought-after) genetic superiority (Gangestad & Scheyd, 2005; Maner et al., 2003). As physical attractiveness is an indication of heritable fitness in men, and this specific characteristic is both immediately observable and critically important to a woman making a short-term mating decision, the strategy of mate copying may hold more utility for making long-term mating decisions.

It has been suggested that mate copying may be a conditional strategy of women to address the issue of assessing male suitability for a long-term, rather than a short-term, relationship (Waynforth, 2007). Waynforth (2007) suggested that while women seeking short-term relationships will primarily attend to physical characteristics (and will be less likely to be influenced by the choices of other women), informational constraints are likely to be more troublesome for women seeking long-term relationships.

Study 1

Initially the study sought to investigate the existence of mate copying propensity by comparing a man presented without a partner to a variety of similarly attractive men presented alongside former partners. Based on evolutionary theory and previous findings, a number of hypotheses concerning the conditions under which mate copying occurs were advanced. First, it was predicted that women would attend to the preferences of men's former partners. Specifically, it was expected that male desirability would be lower when explicit negative information about him was provided by a former partner, than if the information was either neutral or positive. Additionally, it was predicted that the physical attractiveness of a man's former partner would influence his own desirability. Unlike many previous studies addressing the phenomenon of mate copying, the women pictured with men were explicitly described as former (but not current) partners of the men.

Method

Participants

Through advertisements on various social media and research forums, 103 female participants from James Cook University (JCU), Australia and the wider public were recruited ($M = 22.46$ years, $SD = 6.27$ years) and students were awarded course credit for their participation. Participation was restricted to non-homosexual women between the ages of 18 and 45. 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 was suitable/age-appropriate for women in this age bracket. It was considered that homosexual women may be employing different criteria to their opposite-sex attracted counterparts when evaluating men. Additionally, much previous research looking at the phenomenon of mate

copying in humans has selectively focused on women (for a discussion see Anderson & Surbey, 2020).

The majority of these participants indicated that they were either of European (38.8%) or Asian (47.6%) heritage, and 80.6% nominated English as their primary language. Of the sample, 62.1% indicated that that were currently single, and 79.6% had been in at least one romantic relationship in the past. Calculations by the power calculation program G*Power (Faul et al., 2007) indicated that this was well in excess of the sample size needed to achieve power of 0.95, given that each of the independent variables in the current design were within-subjects.

Measures and Materials

The questionnaire consisted of a standard demographics section (age, ethnicity, sexual orientation, etc.) followed by 7 unique scenarios, each including facial pictures of men pictured alongside a recent former partner (6 scenarios), or of a man pictured alone (a control scenario).

In addition to the photographic information, scenarios consisted of short text-based descriptions of the pictured men accompanied by either a green tick (positive), red cross (negative) or no tick, indicating the valence of the mate-relevant information provided by the former partner. In each scenario, participants were asked to respond to a single item: 'please indicate how desirable you find ___ to be' on a 7-point Likert scale, from 1 ('not very') to 7 ('very'). An example of one of the scenarios is given in Fig. 1.

All men were selected to be similarly physically attractive, but their former female partners were selected to be either physically attractive ('high') or unattractive ('low'), and provided positive, neutral or negative mate-relevant information about the targets ('he was a good/average/bad partner'). Participants were asked to consider how desirable they considered the pictured man to be for a long-term relationship. All participants saw all 7 combinations of these variables $(2 \times 3, +1)$, exactly once each.

Photographs were pre-rated from a pilot study and were assigned to conditions based on their attractiveness ratings. Photographic stimuli comprising the main part of the study were sourced from the Karolinska Directed Emotional Faces set (Lundqvist et al., 1998) and were pre-rated for attractiveness by a separate pool of JCU undergraduate students and members of the general public in a preliminary study $(N=63)$. In this pilot study, participants (men and women) were each presented with 21 male and 21 female faces (full list available on request) and asked to give each of the facial images they were presented with an attractiveness rating on a 9-point Likert scale, ranging from 1 ('not very') to 9 ('very'). Although a total of 21 male and 21 female faces were rated, only 7 male and 6 female faces were used in the next phase of the study. The 3 most highly rated and 3 least highly rated female faces from the pilot study were used in the attractive and unattractive former female partner conditions, respectively. Seven of the men whose attractiveness ratings were closest to the average of the 21 male faces rated were selected to be presented as target men. The selection of stimuli pre-rated as either comparably attractive, or high/
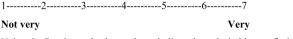
Below are pictures of Michael and his most recent former partner Zara.

When asked if Michael was a good or a bad partner Zara said he was **bad.**

When responding to the following questions about Michael please consider how you would feel about him as a **long-term** partner (the kind of person you might like to marry).

NB: Images AM10NES and AF10NES taken from the Karolinska Directed Emotional Faces set

1---------2---------3---------4---------5---------6---------7

Not very   **Very**

Using the 7-point scale above please indicate how desirable you find Michael to be

Fig. 1 Example item from questionnaire

low on this dimension was considered an adequate control for the attractiveness of the targets.

Procedure

The questionnaire was administered online with the use of the internet survey software tool SurveyMonkey (www.surveymonkey.com) and JCU research software (Sona). Participants were free to complete the questionnaire online at a physical location of their choice. Participants were directed to an online site where they could complete the questionnaire. They were initially asked to respond to a number of generic background questions. Following this, a series of scenarios featuring male–female composite pictures and pictures of men alone were presented. Participants were explicitly instructed to respond as if they were single and free to engage in a new romantic relationship. Each scenario explicitly described the couple as former partners and provided information supposedly given by the woman concerning whether the man pictured was a good relationship partner. Participants were then asked to indicate on a 7-point scale 'how

desirable they found _ [the man pictured] to be', from 'not very' to 'very'. This was the only dependent measure employed throughout the study. Each scenario followed an identical format; however, the woman pictured with the target male was either attractive or unattractive and said that her former partner was either a 'bad' (negative information), 'average' (neutral information) or 'good' (positive information) partner.

Results

Preliminary Analyses and Primary Descriptive Statistics

Although participants were asked to respond as if they were currently single, there have been documented instances of a woman's relationship status affecting how romantically desirable she finds a man (Bressan & Stranieri, 2008). Therefore, we initially examined whether participants responded differently depending on whether they were currently single. A one-way between-groups multivariate analysis of variance (MANOVA) was performed on the ratings for the 7 target men, with relationship status (single/non-single) being the independent variable. Preliminary assumption testing was conducted, with no serious violations of normality, linearity, univariate or multivariate outliers observed. No difference was found between single and non-single participants on the combined dependent variables, $F(14, 84) = 1.74$, $p = 0.06$, $\eta^2 = 0.23$, Wilks' Lambda = 0.78. Thus, single and non-single participants were combined for analysis. Table 1 below shows desirability ratings for target men. There was one man in each condition.

Test of Predictions

To test for mate copying, t-tests were conducted comparing differences between the desirability of each of the formerly partnered men and the man presented without a partner. Results are given in Table 2.

Table 2 indicates that there was evidence of mate copying, with formerly partnered men being considered more desirable than men described as currently single (with no information given about former partners) in four of the six instances. A

Table 1 Mean (SD) desirability ratings given for target men

Partner attractiveness	Information given by former partner			Total
	Positive	Neutral	Negative	
High	2.50 (1.41)	2.36 (1.22)	2.22 (1.24)	2.37 (1.05)
Low	2.24 (1.36)	2.00 (1.22)	1.78 (.93)	2.01 (.97)
Total	2.38 (1.10)	2.18 (1.02)	2.00 (.90)	2.21 (.91)

In addition, the man presented without a partner had a desirability rating of 2.02 ($SD = 1.17$)

Table 2 Mean desirability differences between the man alone and formerly partnered men

| | Information given by former partner | | |
Partner attractiveness	Positive	Neutral	Negative
High partner attractiveness	.49*	.34*	.21
Low partner attractiveness	.23*	− .02	− .24*

Positive values indicate an elevation in desirability with the addition of a former partner

*$p < .008$ (Bonferroni corrected)

significant difference (Bonferroni adjusted $p < 0.008$) in the predicted direction was indicated in three of these comparisons.

A 2 (high vs. low partner attractiveness) × 3 (positive vs. neutral vs. negative information given) within-subjects ANOVA was conducted on the desirability of the 6 target men to determine if either partner attractiveness ('attractiveness'), or information from former partners ('information') had an effect on male desirability. In ANOVAs where a violation of the assumption of sphericity occurred, the Greenhouse–Geisser correction has been used and adjusted degrees of freedom are reported.

Results revealed significant main effects for attractiveness, $F(1, 102) = 29.71$, $p < 0.001$, $\eta_p^2 = 0.20$, and information, $F(1.87, 190.72) = 8.78$, $p < 0.001$, $\eta_p^2 = 0.07$ but no interaction between the two. Bonferroni post-hoc analyses for information indicated that men whose former partners provided positive information about them were rated as being more desirable than men whose former partners provided either neutral ($p < 0.05$) or negative ($p < 0.001$) information about them. Men in the neutral and negative conditions were comparably desirable.

Discussion

By asking women to rate men pictured alone or with a former romantic partner, a propensity for women to copy the mate preferences of other women was demonstrated. It was hypothesised that information provided by a former partner and the attractiveness of said partner would influence male desirability. Results suggested that explicit positive information provided by a former partner increased a man's desirability, whereas explicit negative information decreased it. Additionally, having an attractive former partner increased a man's desirability whereas having a relatively unattractive former partner decreased it.

The Propensity of Women to Mate Copy

A propensity to mate copy was indicated by women rating partnered men as more desirable than those pictured alone. It is noteworthy that the magnitude of the mate copying effect was largely dependent on the information provided by former partners (either explicitly or implicitly). The physical attractiveness of a former female partner was considerably important when the desirability of a man was being evaluated.

In this context, mate copying was consistently indicated when his former partner was attractive (irrespective of the valence of information she gave). These results are consistent with the suggestion that mate copying is determined to a great extent by the physical attractiveness of a man's female partner.

The Importance of Mate-Relevant Information Provided by Former Partners

The results suggest that the valence of information provided by a former partner is particularly important in determining male desirability. The provision of positive or negative mate-relevant information either respectively enhanced or diminished male desirability. Importantly, if a man's former partner is unattractive, the current findings suggest that the *only* way she can enhance his perceived desirability to prospective partners is by offering positive information about him.

Another way of framing the overall finding here, is that while a man's former partner has the ability to enhance his desirability, she also has the ability to diminish it. Both are arguably instances of mate copying. Whereas the former (*positive* mate copying) involves directly copying an observed preference for a mate- male desirability as a mate being enhanced by simple virtue of him being chosen as a mate previously- the latter involves heeding a more implicit caution- negative mate-relevant information being offered by a former partner (*negative* mate copying).

How the Attractiveness of a Man's Female Partner Affects Him

Based on previous literature it was hypothesised that the attractiveness of a man's (former) romantic partner would affect how desirable he himself was considered. Having an attractive former partner was important and consistently led to an increase in desirability, regardless of the valence of information offered by a former partner. Having an attractive former partner implicitly indicates that a man has at least some unobservable, romantically/socially desirable traits (that allowed him to retain the favour of an attractive woman).

Consistent with the findings of Waynforth (2007) and Yorzinski and Platt (2010) having an unattractive former partner actually decreased a man's desirability. While the decrease was marginal when that former partner explicitly provided neutral information about him, it was significant if the information was negative. In other words, being given a 'bad (relationship) review' by someone familiar with the product (the man in question) was enough to lower a man's desirability. A limitation of the current study is that it did not include a condition whereby a former partner was averagely attractive. Doing so would have allowed for more differentiated conclusions to be drawn. Future studies may also wish to consider comparisons of how desirability is affected by information offered by those romantically unfamiliar with the individual in question.

In Study 1, female stimuli were selected on the basis that they were rated as the most or least attractive among the stimuli evaluated; however, due to practical considerations, this pool was not optimally large. Participant comments indicated that

the 'attractive' former partners were not particularly attractive. This was reflected in the descriptive statistics of the preliminary study, in which no female photographs received an average attractiveness rating greater than 7 out of a possible 9. Given studies suggesting that highly attractive women enhance a man's mate value whereas unattractive female partners lower it (Chu, 2012; Little et al., 2011; Vakirtzis & Roberts, 2009, 2010; Waynforth, 2007; Yorzinski & Platt, 2010) researchers wishing to examine the effect of female attractiveness on mate copying should consider the inclusion of more highly (rather than moderately) attractive female stimuli, as this may strengthen the power of the tests. While the male photographs employed were pre-rated as average in attractiveness in the same preliminary study, insufficiently attractive female stimulus photographs may partially explain why the same men pictured in composite photographs in the current study were rated as well below average in desirability. Finally, when interpreting the results of the current study it is worth noting that findings reported here may or may not replicate in a more naturalistic setting. While indicating preferences anonymously has been shown to be a reliable indicator of actual behaviour (Digelidis et al., 2003; Muir & Ogden, 2001; Spence & Townsend, 2006) future studies may wish to consider the use of controlled in vivo methodologies, or possibly increasing ecological validity by incorporating more 'natural' looking stimuli (replicating a dating profile for example).

Study 2

In study 1 women adjusted their ratings of men upon hearing positive or negative information from women they neither knew nor had any connection with. How these results might vary if information (implicit) was offered by non-strangers, possibly even close friends, was investigated in Study 2. As opinions of others with whom one has a close relationship are generally more highly regarded than those offered by strangers (Kinley et al., 2010; Marti & Garcia-Molina, 2006; Ostaszewski & Osiński, 2011), it seems reasonable to suggest that information from closer sources may be even more important. However, due to the considerable social proscriptions *against* dating someone that has previously been romantically involved with a friend of yours, a non-directional hypothesis was tested.

Additionally, while study 1 examined how the desirability of a man varied according to aspects of his previous relationship, it did not clarify how it is affected by the duration of his previous relationship. Given that mate-standards are generally higher for long-term relationships than short-term relationships, men selected for a long-term relationship generally have more desirable mate-relevant qualities than those selected for a short-term relationship. Therefore, men who have previously been in a long-term relationship may be considered even more desirable than those who have previously been in a short-term relationship. Study 2 was conducted in part to address the question of whether or not the modification in desirability of formerly partnered men is duration-specific.

Method

Participants

As with Study 1 participants were recruited via advertisements on various social media and research forums. Two hundred and eighty-four female participants were recruited ($M = 22.35$ years, $SD = 5.99$ years) and awarded course credit for their participation if they were students of JCU but no incentive if they were members of the wider public. Participation was restricted to non-homosexual women between the ages of 18 and 45. Calculations by the power calculation program G*Power (Faul et al., 2007) indicated that this was well in excess of the sample size needed to achieve power of 0.95, given that only one of the independent variables in the current design was a between-subjects measure (two levels). The majority of these participants indicated that they were either of European (56.3%) or Asian (21.8%) heritage, and 89.4% nominated English as their primary language. Of the sample, 48.4% indicated that that were currently single, and 85.9% had been in at least one romantic relationship in the past.

Measures, Materials, and Procedure

The questionnaire and procedure employed in Study 2 were very similar to that in Study 1, but with a few key differences. Participants were randomly assigned to see either a sequence of three men all of whom had either recently ended a long-term or short-term relationship (between-subjects variable) with a good friend of the participant's or someone unknown to them. Additionally each participant viewed a third scenario in which a man was described as not having been in a relationship recently. Thus a given participant saw a total of exactly 3 scenarios in the 2×3 design.

After each scenario participants were asked to indicate (on a 7-point scale from 'Not at all' to 'Extremely') how desirable as a long-term partner they found the pictured man. Unlike in Study 1 only male pictures were shown while female former partners were described. Participants were asked to imagine that the woman in question was reasonably attractive. Male photographs were selected on the basis that they had been pre-rated as comparable in attractiveness in a large German study (Braun et al., 2001). Additionally, scenarios were entirely counterbalanced such that a given photograph of a man would randomly appear in either of three scenarios (per participant). The order in which scenarios appeared to participants was also counterbalanced.

Results

Preliminary Analyses and Primary Descriptive Statistics

As with Study 1, we initially examined whether participants responded differently depending on whether they were currently single. No difference was found between single and non-single participants on the combined dependent variables, $F(6,$

Table 3 Mean (SD) desirability ratings given to men based on a participant's relationship to his previous partner

Relationship duration	Relationship to participant			Total
	Good friend	Unknown	No previous partner	
Short-term (2 months)	2.86 (1.52)	2.99 (1.52)	3.34 (1.46)	3.07 (1.63)
Long term (3 years)	3.01 (1.35)	3.46 (1.43)	3.43 (1.33)	3.30 (1.58)
Total	2.94 (1.44)	3.23 (1.49)	3.39 (1.40)	3.18 (1.13)

538) $=1.1$, $p=0.37$, $\eta^2=0.01$, Wilk's Lambda $=0.98$. Thus, single and non-single participants were combined for analysis. Table 3 below shows desirability ratings for each of the six target men.

Test of Predictions

To test for an individual's propensity to mate copy a 2×3 mixed within/between-subjects ANOVA was conducted on the long-term desirability of the 6 target men. There was an effect of the previous partner's relationship to the participant, $F(2, 546)=11.89$, $p<0.001$, $\eta_p^2=0.04$, but not of the duration of the relationship or an interaction between the variables. Bonferroni post-hoc tests indicated that men were regarded as being more desirable to participants if they (the men) had not had a partner in the past three years than if their former partner was either someone unknown to the participant, $t(275)=3.16$, $p<0.05$, or if they were a good friend of the participant, $t(274)=4.73$, $p<0.001$.

Discussion

The hypothesis that a man's desirability as a partner would be affected by the length of the relationship he had recently been in was not supported. The prediction that men emerging from longer relationships would be regarded as more desirable than men whose most recent relationship was relatively short was partly based on the well-established social proscription against promiscuity (Bleske & Shackelford, 2001; Buss, 1994; Buss & Scmitt, 1993; DeGue & DeLillo, 2004). A man whose romantic relationships are of a short duration may be indicating an undesirable unwillingness or inability to maintain long-term commitment, and thus may be disfavoured over a man indicating a more long-term/committed strategy. Although a single short-term relationship should not be taken as evidence of a man's proclivity for promiscuity, it is probably more consistent with such a proclivity than say a single known instance of a long-term relationship.

The hypothesis that a man's desirability would be affected by the evaluating woman's association with his previous partner (friend/unknown), was supported. Interestingly, women regarded men, with a former partner they imagined to be a good friend of theirs, as *less* desirable than if they imagined his former partner

to be someone unknown to them, or if he had not had a former partner in the past three years. These findings may initially appear to be inconsistent with the phenomenon of mate copying, at least how it is typically defined as some sort of increase in the mate value of a formerly (or currently) partnered man by virtue of the implicit endorsement his former (or current) partner is giving him, compared to formerly (or currently) unpartnered men. However, I would suggest that the fact that male desirability was *lowered* by him having a former partner who the participant imagined was a good friend of hers (compared to being unpartnered) indicates that women were attending to implicit information offered by the former partner of the man in question when evaluating him. His desirability was effectively modified; but it was reduced rather than enhanced by his former romantic association. Rather than being a challenge to the general phenomenon, this pattern of mate copying merely exists as a negative point on the overall spectrum, and suggests that it is possibly a much more nuanced phenomenon than previously assumed.

The finding that men were considered relatively undesirable if their previous partner was a good friend of the person evaluating their desirability, may indicate that women have a considerable social proscription against desiring one of their female friend's previous partners. There are a number of possible explanations for this social phenomenon.

In a very general sense it is in the interest of any given individual to maintain some kind of group cohesion (Horne, 2001; Thye et al., 2002).

There is a multitude of evidence suggesting that both individual and group goals are more effectively achieved by a coalition of like-minded participants (Cohen & Bailey, 1997; Gladstein, 1984; Johnson et al., 1981). There is a strong gender difference here whereby women, to a greater extent than men, are faced with recurring evolutionary problems that require, or are at least addressed more effectively by coalition-minded solutions. It makes social sense for a woman to want to maintain what close same-sex bonds she has. Becoming romantically involved with the former partner of a close friend would threaten this as it is socially proscriptive (Fisher et al., 2009) and may be seen as a transgression and/ or trivialisation of the friendship. This is a clearly undesirable consequence.

Additionally, due to the quality and volume of social information that is exchanged between women in close relationships (McDonald et al., 2007), and the strong tendency of individuals to report specifically negative information rather than sing the praises of a romantic partner (Rozin & Royzman, 2001), a female close friend of a woman has likely heard a preponderance of negative information about the dated partner. Possibly even about his suitability as a partner. Further, if the women were close friends, they may well have exchanged negative information regarding the man and his involvement in the breakup. This would likely leave a third party with an unfavourable impression of the subsequently evaluated man.

General Discussion

Mate copying has previously been demonstrated by asking women to rate the desirability of target males given varying profiles. (Cunningham et al., Unpublished results; Vakirtzis & Roberts, 2010). The current research is novel in that mate-relevant information was provided by former partners who are in a very good position to assess the targets' mate-relevant qualities. Information about men has previously been demonstrated to affect their desirability, but this research is unique in demonstrating that mate-relevant information provided explicitly by former partners can considerably influence how a man is assessed romantically by other women.

Implications of the Current Research

The findings of these studies contribute to the growing body of literature supporting the existence of mate copying in humans. Unlike many previous studies depicting *currently* involved men, the current research indicated that having *formerly* been involved in a romantic relationship can modify male desirability to prospective partners. This suggests that both the desirable and undesirable mate-relevant characteristics associated with having a romantic partner are enduring. Anderson and Surbey (2014) found that currently partnered men were less desirable to women than formerly partnered men. Knowledge that a man has *previously* been considered mate-worthy by women (but is currently available) may be enough to modify his desirability upward or downward, depending partly on the characteristics of his former partner. The authors additionally found that while some relationship experience was desirable (1 or 2 previous partners in the past 4 years) an excessive amount (5 previous partners in the past 4 years) was far less desirable.

As previously mentioned, having been involved in a romantic relationship may enhance male desirability, but by itself is not an overly impressive romantic feat given the fact that most people can be expected to enter into a romantic relationship at some point in their lives. A former partner providing positive mate-relevant information is presumably satisfied (to some extent) with the nature of the exchange. This may act as an additional 'endorsement' of a man. However, negative mate-relevant information provided by a former partner may considerably undercut the enhanced desirability conferred upon him by having been in a romantic relationship. Women may be especially sensitive to explicit negative mate-relevant information about a man, as it effectively indicates that he is a bad romantic investment, and choosing an appropriate romantic partner has considerable fitness consequences. Scammell and Anderson (2020) found that although a man's romantic desirability was moderately enhanced by a positive evaluation from a former partner ('He was a good partner'), it was considerably diminished by an unfavourable one ('He was a bad partner').

Similarly, the undesirability of a friend's former partner may be largely due to not wanting to violate unspoken social proscriptions and thereby damaging

socially supportive same-sex relationships. From an inclusive fitness perspective, the withdrawal of helpful support from a social alliance member may be realistic and an aversive enough consequence of pursuing a friend's previous partner to maintain the social proscription against it.

Conclusion

This research provides further evidence for the phenomenon of mate copying in humans by describing a *former* rather than a *current* relationship, and also introduces the idea of *negative* mate copying, as a sub-component of the broader phenomenon. Explicit and implicit mate-relevant information offered by a third party was of considerable importance in determining a man's perceived romantic desirability. Consistent with previous research, the attractiveness of female partners had a large positive effect on a man's desirability. Additionally, the relationship of a man's previous partner to the participant considerably modified his desirability.

The current studies extend previous research concerning mate copying in humans in general by providing evidence that mate copying is considerably nuanced. The phenomenon is better described conditionally rather than using a 'one size fits all' approach. This research shows how variables such as the physical attractiveness of a man's former partner, the type of explicit mate-relevant information offered about him, and the type of association between a former and prospective partner affect his perceived desirability.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical Approval The studies described herein each received ethical approval from the James Cook University Human Research Ethics Committee (approval number H5858 (Study 1), and H7320 (Study 2)).

Consent to Participate All participants in these studies willingly consented to participate in this research (see above).

Consent for Publication As the sole author of this manuscript I hereby consent for it to be published.

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