



What You See May Be What You Want: Mate Copying in a Natural Setting

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Received: 2 February 2022 / Revised: 23 June 2022 / Accepted: 13 July 2022 /

Published online: 27 July 2022

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Abstract

Objectives The phenomenon of mate copying (MC) suggests that an individual's romantic desirability varies, to some degree, as a function of their romantic experiences. By manipulating relationship history, this research aimed to determine whether male desirability varied similarly for static stimuli (photographs) as it did for dynamic stimuli (short clips). Here we present 2 studies examining this idea.

Methods In both studies heterosexual women aged 18–34 were recruited from social media and evaluated the desirability of men, before and after being given information about the level of relationship experience the men had previously had (either 'none', 'some', or 'lots').

Results In Study 1 ($N=278$), we employed static images of men and Study 2 ($N=66$) was methodologically similar but employed dynamic stimuli. Study 1 indicated that a man's desirability to heterosexual women increased when it was revealed that he had a moderate amount of relationship experience but decreased if he had none. Results from Study 2 suggested that desirability was not affected by an individual's relationship experience.

Conclusions MC was indicated when stimuli were static, but not when they were dynamic. These results suggest that MC may be a phenomenon that exists to a greater extent when stimuli are less informative.

Keywords Attraction · Dating experience · Desirability · Mate copying · Relationship history · Social influence

Mate copying (MC) is an idea that was initially (and has been thoroughly) investigated among nonhumans (Vakirtzis, 2011) but has only been studied in humans for the last thirty years (Anderson & Surbey, 2020). Within a heteronormative

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understanding, the basic idea is that an individual observes an opposite-sex other (hereafter referred to as the target) in some kind of a courting/relationship sequence with an individual of the opposite sex to the target (nonhumans). Alternatively, the participant learns romantic information about the target (humans), and subsequently adjusts their romantic appraisal of them. MC can be thought of as attending to a specific type of mate-relevant social information.

MC occurs when individuals analyse social cues and contextual information to help them discern who is an appropriate mate (Anderson & Surbey, 2020; Burch et al., 2021; Moran & Wade, 2022; Scofield et al., 2019; Street et al., 2018). This additional information about a potential romantic partner can change their perceptions of the potential partner's attractiveness and relationship desirability. Rather than incurring the substantial costs of gathering mate-relevant information about a prospective mate via traditional means (e.g. dating), one can discern similar information at a far lower cost by copying the mate-choice information of others. Although there is the possibility that information obtained in this way may be less accurate, the costs of time and effort in using one's own assessment are such that MC is a net adaptive sexual strategy.

There is a difference between the sexes and their needs when seeking an appropriate mate (Lu & Chang, 2012). A man can discern a considerable amount of mate-relevant information by observing the physical quality of a target woman, namely characteristics indicative of their youth, fertility, and attractiveness (Anderson & Surbey, 2020; Chu, 2012; Hill & Buss, 2008). Such information is easy to assess visually. A woman seeking a mate will, however, typically look for information related to an ability to accrue resources, indications of high socio-economic status, and a willingness to commit to the woman (Anderson & Surbey, 2020; Chu, 2012; Milonoff et al., 2007; Scofield et al., 2019; Vakirtzis & Roberts, 2012; Waynforth, 2007). Such information is more difficult to obtain from visual observation alone, and thus romantic evaluation of an opposite-sex other becomes appreciably more accurate when augmented by additional mate-relevant social information. If a woman was to choose a mate who does not possess any of the aforementioned qualities, it could be costly in terms of both time and energy, both of which may be more effectively used to find a better mate (Anderson & Surbey, 2014; Deng & Zheng, 2015; Hill & Ryan, 2006; Jones et al., 2007). Thus MC can be thought of as an adaptive strategy to solve the recurring problem faced by both sexes of evaluating a potential mate. The sequence of studies presented here focus on heterosexual women as they perform and benefit the most from MC (Deng & Zheng, 2015; Parker & Burkley, 2009).

Relationship History

Learning of a negative evaluation about a prospective mate, such as that they were rejected/abandoned by their previous partner, is likely to negatively affect evaluations of them as a long-term relationship partner (Anderson et al., 2018; Scammell & Anderson, 2020; Stanik, 2009). This indirect influence, or social transmission of information (Jones et al., 2007), enables an individual to better understand their target without the cost of meeting them themselves and is a form of MC.

A previous study designed to understand the mating potential of target men explicitly stated their relationship history. Anderson and Surbey (2014) had participants rate the attractiveness and relationship desirability of men who differed only in how many previous relationships they had experienced. Silhouettes of one to five women were used to indicate previous relationship experience. A conceptually similar study asked participants' willingness to engage in a short-term or a long-term relationship with someone who had "x" number of past relationships, spanning from none to 60+ partners (Stewart-Williams et al., 2017). Both studies found that women aged in their early 20's preferred to engage in long-term relationships with men who had *some* romantic history, namely one to two previous relationships. Moreover, the target men who had no romantic history were rated similarly to men with four or five romantic ex-partners (Anderson & Surbey, 2014). However, participants were more willing to engage in a relationship with someone with no romantic history compared to someone who had more than six previous sexual partners (Stewart-Williams et al., 2017).

The preference for low levels of sexual promiscuity may suggest that individuals want to reduce their chances of contracting sexually transmitted pathogens (Epstein et al., 2007). Having been in many past relationships might also suggest that an individual is unwilling to emotionally commit, a highly undesirable psychological characteristic (Manna, 2009). Similarly, the undesirability associated with having no relationship experience possibly suggests that an individual has been romantically avoided for a good reason. He (or she) possibly possesses some romantic attribute that for whatever reason is disfavoured by the opposite-sex, and would presumably carry forth into any subsequent relationship.

These findings described above may possibly also be limited by the young ages of the participants and their limited years of exploring romance and sexuality (Anderson & Surbey, 2020). When Stewart-Williams et al. (2017) compared the results of their participants aged over 22 years to those aged under 21 years, they found that older women tolerated higher numbers of past partners. This finding was similar to other studies suggesting that age is inversely related to MC (Anderson & Surbey, 2014; Vakirtzis & Roberts, 2012). Young women are presumed to have less experience in discriminating between mate quality and thus are more likely to consider older women's behaviour when considering mates for themselves (Anderson, 2018; Anderson et al., 2018; Bowers et al., 2012; Vakirtzis & Roberts, 2009). Similar effects were seen in female guppies, where the young females would copy the older females, but the older female guppies would not copy the behaviour of the younger (Dugatkin & Godin, 1993). It is, however, important to note that not all studies with humans have found that age was a significant predictor of MC (Waynforth, 2007). Nevertheless, these findings give an indication as to why young women are typically the population of interest in MC studies.

It is also worth noting that psychological research in general, and research focusing on relationships and mating/dating behaviour specifically, tends to disproportionately attract female respondents. Additionally, possibly due to contemporary recruitment methods (with social media becoming an increasingly popular recruitment tool), participants doing this kind of research tend to be younger (often below the age of 40). The self-selection issue may be providing a myopic view of mating behaviour.

Hypotheses & Research Question

Previous studies examining the phenomenon of MC have often presented targets as currently in relationships (Burch et al., 2021; Moran & Wade, 2022; Kalaitzaki et al., 2018; Rodeheffer et al., 2016). Due to the social proscription against desiring a partnered individual (and other reasons, for a discussion see Anderson & Surbey, 2020), both Study 1 and Study 2 present men who are explicitly described as single. The key difference of interest between the studies is that where Study 1 presents participants with static stimuli and a methodology which is quite typical of research in this area, Study 2 employs dynamic video stimuli, and thus a direct comparison of the modalities can be made.

For both Study 1 and Study 2, it was hypothesised that the addition of text-based information about a man's romantic history would modify his perceived desirability as a long-term partner. Additionally, it was hypothesised that the pattern of desirability modification observed would be generally consistent with that established in previous MC literature, specifically, indications that a man had had either a lot, or no, relationship experience would reduce his desirability, whereas the revelation of having had a moderate amount of relationship experience would increase it.

Method

Participants

The sample comprised 278 heterosexual women between the ages of 18 and 33 ($M_{\text{age}} = 23.79$ years, $SD_{\text{age}} = 3.69$ years) recruited through paid advertisements on Facebook. Participation was limited to heterosexual women as romantic desirability was being evaluated and it was considered that non-heterosexual women may be employing different criteria when evaluating this in a prospective romantic partner (Lucas et al., 2011; Scofield et al., 2019; Valentova et al., 2016). The age range was truncated as the target men shown were all between the ages of 20–29 and thus participants that were too much older than this may regard men as undesirable simply because of their youth (Buunk et al., 2001). Additionally, women in the sampled age range are presumed to be interested in seeking a mate. Nearly half of all respondents were single (49.6%), and the majority were of European heritage (78.7%). Upon survey completion, participants were invited to enter a prize draw to win a \$50 Coles and Myer Group gift voucher.

Design

This survey was entirely within-subjects and each participant viewed a total of three men. The independent variables employed in this study included *time* (before the addition of information about the relationship history of the target men (time 1 or T1) and after it (time 2 or T2)), and *relationship experience* (men were described as having had either 'lots', 'some', or 'no' relationship experience). The dependent

variable was the rating of desirability as a long-term partner. In addition, each participant rated the physical attractiveness of each of the three target men on a 7-point scale. Given that all conditions were within-subjects, a power analysis by the program G*Power (Faul et al., 2007) indicated that a sample of only 19 would be adequate to detect a large effect ($f^2=0.25$) with power of 0.8. Our sample size of 278 was well in excess of this. Given current discipline wide concerns about the reproducibility of results, a desired power of 0.95 would still only require a sample of 166, which is well below the current sample size.

Materials and Procedure

The photographic images used in this study were taken by the researchers (friends of the secondary author; full consent was obtained from all men) and involved three male volunteers between 20 to 29 years of age. While all appeared to be in their mid-20 s, the specific ages of the men were not presented to participants. The three men chosen for the study were selected on the basis that they seemed to be comparably attractive. This was subsequently confirmed in a statistical analysis (see results section below). Data for both studies can be found at https://osf.io/w7mpe/?view_only=933d227482f24e97a36d4422206c5dc and materials are available upon request.

After responding to a series of demographic items, participants consented to ‘attend a party’, where a sequence of men were approached and the males smiled and greeted the camera. Note that the stimuli of the males were static in Study 1 and dynamic, recorded footage in Study 2. The static stimuli were stills taken from the dynamic stimuli, to reduce extraneous variables, (environmental, temporal, lighting, facial expressions). In Study 1, there were no differences between the stills in T1 and T2. At the end of each greeting, the participants responded to questions about each man. At T1, after participants were provided no information about each man, they were asked to indicate on a seven-point Likert scale, from 1 (*not at all*) to 7 (*extremely*), ‘How likely would you be to engage in a long-term relationship with him?’. This was followed by a distractor task (participants read an article about bald men) after which additional relationship history information about each of the three men was provided and the men from the party were individually re-rated (T2). Men were described as having had either ‘lots’, ‘some’, or ‘no’ relationship experience (e.g. *This is Bryce. He has lots of relationship experience*). The descriptions were consistent across participants. Participation overall took between 10 and 15 min. For Study 1 and Study 2 ethics approval was granted by the Monash University Human Research Ethics Committee.

Results

Preliminary Analyses and Descriptive Statistics

As there is some evidence that MC propensity varies depending on whether the participant doing the rating is single or in a relationship (Bressan & Stranieri,

2008), a one-way MANOVA was conducted on the desirability difference scores (T2-T1) to determine if there was any difference between these two groups on the combination of the dependent variables. Results suggested that single ($n = 138$) and non-single ($n = 140$) individuals did respond differently, $F(3, 273) = 3.97$, $p = 0.01$; Wilks' Lambda = 0.96, $\eta_p^2 = 0.04$. When the dependent variables were considered separately, the only difference to reach significance (using a Bonferroni adjustment for multiple comparisons) was for the change in ratings (T2-T1) for the target man with no relationship experience, $F(1, 275) = 5.99$, $p = 0.045$, $\eta_p^2 = 0.02$. An inspection of the means indicated that single individuals drop their ratings of long-term desirability only minimally upon learning that a man has no relationship experience (2.66 to 2.64) whereas women in relationships dropped their ratings further (2.95 to 2.67). As it was the only dependent variable of the three to have an effect, and the difference was marginal, the analysis was run as planned.

Although the three men chosen for the study were selected on the basis that they seemed to be comparably attractive, in order to determine whether or not this was the case, we had each participant rate each man on attractiveness (prior to presenting information about their relationship history). A one-way repeated measures ANOVA indicated that the men were indeed comparably attractive, $F(1.91, 528.02) = 0.97$, $p = 0.38$, $\eta^2 = 0.003$. The average attractiveness score for each man was between 3.31 – 3.43 out of 7.

It has additionally been demonstrated that experiential factors such as age can influence the propensity of individuals to mate copy (Anderson & Surbey, 2014; Bowers et al., 2012) thus a series of zero-order correlations were performed between 'age' of the participants and the ratings adjustment for each condition (T2 – T1). Although age did not correlate with the change in desirability ratings of men who had had either 'some' or 'lots' of relationship experience ($r = -0.08$, $p = 0.17$, $n = 278$ and $r = -0.08$, $p = 0.21$, $n = 277$ respectively), there was a small correlation with men described as having had no experience ($r = -0.13$, $p = 0.04$, $n = 278$). As this was quite a weak association and occurred for only one of the conditions, age was not statistically controlled. Including age as a covariate did not change the pattern of results from the ANOVA.

The average desirability as a long-term partner (across the three target conditions that each participant saw) was calculated per participant, and the averages *per condition* are presented in Table 1 below.

Table 1 M(SD) Average desirability as a long-term partner for each relationship experience condition at time 1 and time 2 (Static) (N = 277)

Time	None	Some	Lots	Total
T1	2.81 (1.46)	2.59 (1.37)	2.87 (1.48)	2.76 (1.17)
T2	2.65 (1.55)	2.80 (1.53)	2.66 (1.44)	2.70 (1.24)
Total	2.73 (1.44)	2.70 (1.37)	2.77 (1.38)	2.73 (1.17)

Inferential Analyses

Preliminary assumption testing was carried out for the intended 2-way within-subjects ANOVA with no serious violations detected. Sphericity was assumed for the variable of time, but the assumption was violated for relationship experience (Greenhouse–Geisser correction used) and met for the interaction between the variables. A 2×3 repeated measures analysis of variance was conducted to compare the mean long-term desirability scores across time (T1/T2) and relationship experience (none/some/lots). Ratings of long-term desirability did not change overall from T1 to T2, $F(1, 276) = 2.80$, $p = 0.10$, $\eta_p^2 = 0.01$. There was an interaction between time and relationship experience, $F(2, 552) = 16.01$, $p < 0.001$, $\eta_p^2 = 0.05$. Table 1 indicates that while each relationship experience condition *changed* considerably from T1 to T2, ratings only *increased* when it was revealed that the man had ‘some’ relationship experience, $t(277) = 3.65$, $p < 0.001$, $d = 0.22$. When it was revealed that a man had either ‘no’ relationship experience, $t(277) = -2.84$, $p = 0.02$, $d = 0.17$, or he had ‘lots’ of relationship experience, $t(276) = -3.63$, $p < 0.001$, $d = 0.22$, his desirability decreased significantly. There was no overall effect of relationship experience, $F(1.88, 518.91) = 0.40$, $p = 0.66$, $\eta_p^2 = 0.01$.

Discussion

This study sought to re-affirm generally established themes within the MC literature using a young sample and vague descriptors of relationship experience. As hypothesised, once knowledge about previous relationship experience is shared, the perceived long-term desirability of men who have ‘lots’ or ‘no’ relationship experience decreased, while the desirability of men with ‘some’ relationship experience increased. These findings are generally consistent with research indicating that women do not want partners who are promiscuous, nor have no relationship experience, but want something in between (Anderson & Surbey, 2014; Stewart-Williams et al., 2017).

Impact of the Target Man’s Relationship History

The elevation in romantic desirability of men that have had some, but not extensive, relationship experience is a consistent finding within the MC literature. Such men have, in a sense, been ‘endorsed’ by previous romantic partners. In general terms, a woman choosing to romantically align herself with a man is presumably doing so for a good reason as relationships have the potential to be somewhat costly for women (Petersen & Hyde, 2011; Vakirtzis & Roberts, 2010). It would be reasonable to imagine that a man receiving the romantic favour of a discerning woman has at least some desirable mate-relevant characteristics, and that these would carry forth into subsequent relationships.

While it may be tempting to extrapolate this logic to a situation where a man has ‘lots’ of pre-approvals, these data suggest that the relationship between relationship experience and romantic desirability is non-monotonic. Indeed, men with excessive, or ‘lots’ of relationship experience were undesirable, possibly due to indicating a proclivity for or tendency toward promiscuity, an intensely undesirable characteristic (Epstein et al., 2007). This finding is consistent with Anderson and Surbey (2014) who found that men described as having 5 previous romantic relationships were significantly less desirable than those that had had 1 or 2, and comparably desirable to men with no relationship experience at all. However, both this study and the current study neglected to gauge male preferences. While there has been some research done previously looking into men’s propensity to MC (for a discussion see Anderson & Surbey, 2020), whether or not heterosexual men specifically exhibit a similar proscription against promiscuity in a prospective romantic partner is unclear and awaits further enquiry.

Study 2

Study 1 was somewhat restricted in that the stimuli presented to participants were static. A problem within much of the current MC literature is methodological as previous studies have largely neglected to use naturalistic settings to explore the phenomenon. This is entirely understandable, and very typical of academic research, as static stimuli offer a lot of experimental control and hence the ability to quantify nuanced effects. However, the information that a prospective mate can glean from a static photograph is very likely to be qualitatively different from the information that can be gleaned from dynamic footage. Various dating apps, such as Tinder and Bumble, now allow users to post videos in their ‘about me’ portfolios whereas they once only permitted photos to be shared. Study 2 aimed to partially address this issue by presenting dynamic stimuli and thereby attempting to determine whether videos of target men and new social knowledge will generate MC propensities in women. Study 2 had otherwise very similar aims to Study 1.

The majority of previous MC research is methodologically similar in that participants are shown a static photograph of a target man and then asked questions about his attractiveness or desirability (Lu & Chang, 2012; Milonoff et al., 2007; Vakirtzis & Roberts, 2012). Some studies additionally ask about relationship desirability and whether the participant would engage in a relationship with the target or go on a date with him (Uller & Johansson, 2003; Waynforth, 2007). Research has found that physically strong men are more attractive, and an indicator of good genes can be muscularity (Sell et al., 2017). Therefore, limited visibility of target men, often presented in cropped close-up photographs, makes it difficult for women to visually assess a potential mate’s body – their strength, leanness and height (Lu & Chang, 2012; Sell et al., 2017). Given the restricted access to mate-relevant information, women may be more encouraged to rely on information from external sources (e.g. previous partners). Contrastingly, if women have access to additional, more ‘holistic’, information, they may well be less inclined to employ a strategy of MC.

While the majority of studies have employed static imagery, there have been demonstrations of MC using dynamic footage (Bowers et al., 2012; Place et al., 2010). Place et al. (2010) had participants state whether they would engage in a short term, or a long-term relationship with a target man, they then viewed 10 s of the target man on a speed date. Following this, the participants were asked to rate whether they thought the target and model were interested in each other and then re-rate whether they would engage in a short-term, or a long-term relationship with the target man. Participants rated romantically successful target men as more attractive. However, this study was limited by a small sample size ($n_{women}=40$) and how removed from the situation the participants were as they merely watched the date on a computer screen. Similarly, the target and model only spoke German, which meant that the non-German speaking participants (recruited from an American University) were only able to discern information from tone of voice and non-verbal cues.

The aims and hypotheses of Study 2 were similar to Study 1, in addition to determining whether or not the phenomenon of MC would persist when dynamic stimuli were employed. As the use of dynamic footage in MC studies is far less common than employing text-based stimuli or static imagery, predictions were non-directional and more exploratory.

Method

Participants

In Study 2, 66 Australian heterosexual women between the ages of 18 and 35 ($M_{age}=24.50$ years, $SD_{age}=4.12$ years) were again recruited through paid advertisements on Facebook. 37.7% of all respondents were single, and the majority were of European heritage (79.3%). Upon survey completion, participants were invited to enter a prize draw to win a \$50 voucher.

Materials and Procedure

In Study 2, rather than simply being shown a still image as in Study 1, participants were initially shown a very short sequence of footage (approximately 2–3 s) depicting each individual target man smiling at the camera (his entire clothed body was briefly visible; T1). There were three target men shown. After each sequence, participants were asked to evaluate the man's physical attractiveness and desirability as a long-term partner on a 7-point Likert scale. After a distractor task lasting approximately 5 min (viewing images of various other individuals) they were re-shown longer footage of the same man (approximately 6 s), and were additionally told that he had either 'no', 'some', or 'lots' of relationship experience (materials available on request). In the longer footage, the camera moved towards the man and the men smiled and greeted the camera. Although they weren't emphasised, height and physical stature cues were present. Participants were asked once again to evaluate the men's attractiveness and desirability as a long-term partner (T2). Three unique men

were shown at T1 (and re-shown at T2). Apart from the change to dynamic stimuli, protocols were identical to those employed in Study 1.

As both Study 1 and Study 2 were entirely within-subject designs, and methodologically similar, both were sufficiently powered at $N=278$ and 66 respectively (well above the G*Power recommendations, Faul et al., 2007) to detect even a small effect. However, it should be noted that the actual sample size of Study 2 falls below that required to achieve power of 0.95.

Results

Preliminary analyses and descriptive statistics

Again, a MANOVA was conducted to determine if there was any difference between single and non-single individuals on the combination of the dependent variables. Results suggested that single and non-single individuals did not respond differently, $F(3, 61)=0.59$, $p=0.63$; Wilks' Lambda=0.97, $\eta_p^2 = 0.03$. Considered separately, none of the dependent variables reached statistical significance (all $ps > 0.25$).

Although the three men chosen for the study were selected on the basis that they seemed to be comparably attractive, in order to determine whether or not this was the case we had participants rate each man on attractiveness (prior to presenting information about their relationship history). A one-way repeated measures ANOVA indicated that the men were indeed comparably attractive, $F(2, 128)=1.10$, $p=0.34$, $\eta^2=0.02$. The average attractiveness score for each man was between 2.82 – 3.10 out of 7.

Additionally, age did not correlate with the change in desirability ratings of men who had had either 'some', 'lots' or 'no' relationship experience ($r=0.06$, $p=0.65$, $n=66$; $r=0.10$, $p=0.43$, $n=65$; $r=0.01$, $p=0.94$, $n=66$ respectively).

The average desirability as a long-term partner (across the three target conditions that each participant saw) was calculated per participant, and the averages *per condition* are presented in Table 2 below.

Inferential Analyses

Unlike in Study 1, here age did not correlate with the dependent variable of long-term desirability and was thus not entered as a covariate. A 2×3 repeated measures analysis of variance (ANOVA) was conducted to compare the mean long-term desirability scores across time (T2 – T1) and relationship experience categories of 'none', 'some' and 'lots'. There was an effect of time such that ratings of long-term

Table 2 M(SD) average desirability as a long-term partner for each relationship experience condition at time 1 and time 2 (Dynamic)

Time	Lots	Never	Some	Total
T1	2.34 (1.29)	2.51 (1.46)	2.42 (1.37)	2.42 (1.10)
T2	2.57 (1.40)	2.97 (1.37)	2.51 (1.44)	2.68 (1.03)
Total	2.45 (1.18)	2.74 (1.25)	2.46 (1.26)	2.55 (.97)

desirability increased from T1 to T2, $F(1, 64)=5.97$, $p=0.02$, $\eta_p^2 = 0.09$. Table 2 indicates that this was true of all conditions, however, repeated measures t-tests suggest there was only a significant increase for the ‘never’ condition, $t(65)=-2.78$, $p=0.007$, $d=0.34$. Neither men in the ‘lots’ ($t(64)=-1.41$, $p=0.16$, $d=0.19$) or ‘some’ ($t(65)=-0.63$, $p=0.55$, $d=0.11$) conditions significantly increased in desirability. There was neither an effect of relationship experience, $F(2,128)=2.04$, $p=0.13$, $\eta_p^2=0.03$, nor an interaction between relationship experience and time, $F(2,128)=1.61$, $p=0.21$, $\eta_p^2=0.02$.

Study 2 Discussion

In Study 2 it was indicated that although there was an overall increase in long-term desirability ratings from T1 to T2, the increase was only statistically evident when the presented man was described as having no previous relationship experience. Following from Study 1, the hypotheses that a man’s long-term desirability would decrease upon the revelation that he had either a lot of relationship experience previously, or none, failed to receive support respectively. Furthermore, long-term desirability did not increase when it was revealed that a man had had some relationship experience. A simple inspection of means presented in Table 2 suggests that such men with no relationship experience were similarly desirable to those with lots of relationship experience. The fact that *all* men increased (to some extent) in desirability, regardless of their relationship experience, suggests that it may be the case that MC is not the sole driver of this increase. It may be that simply being exposed multiple times to the same man affords a level of increased familiarity that does not really occur when you are only shown static images of him. These findings present a challenge to our understanding of MC, and this will be discussed further below.

The main aim of Study 2 was to test the ecological validity of commonly used methodologies in MC literature. This was achieved by substituting static stimuli with dynamic and more naturalistic stimuli that more closely approximates a real-life scenario. Study 2 found that men’s long-term desirability increased in *all* conditions (the addition of any information about his relationship experience seemed to make a man more desirable), although the greatest enhancement was when a target man had never been in a relationship previously. This is inconsistent with previous research on MC (including Study 1) which generally suggests that while moderate relationship experience improves male desirability, excessive experience or no experience diminishes it.

General Discussion

The findings of Study 2, specifically that women increase their ratings of male long-term desirability upon learning that he has had either ‘lots’ or ‘no’ relationship experience, are inconsistent with our understanding of MC, but possible explanations do exist. The principal difference between Study 2 and the weight of previous research

in this area lies in the type of stimuli presented. Many studies have reported MC-like effects after presenting either pictorial stimuli, text-based vignettes, or a combination of both (for a discussion see Anderson & Surbey, 2020), but few have employed dynamic footage.

It is worth noting that there was a marginal difference in the attractiveness scores of target men between Study 1 (3.31 – 3.43) and Study 2 (2.82 – 3.10). As the focus was on the difference between T1 and T2, rather than between Study 1 and Study 2, this difference was considered to be of little consequence (to our knowledge, there is no evidence that an attractiveness disparity of this magnitude would have influenced the outcome). How variation in the physical quality of a target influences a participant's propensity to mate copy awaits further enquiry.

Both Vakirtzis and Roberts (2012) and Place et al. (2010), demonstrated MC-like effects using footage without an audio component. Uller and Johansson (2003) by contrast failed to find similar evidence in their study involving live interactions between men and women. In perhaps one of the most realistic examinations of the MC phenomenon, Agnas (2016) had male confederates enter a public area and promptly receive either overt (but non-verbal) signals of sexual interest from physically attractive female confederates or no interest. Female onlookers were subsequently asked about the desirability of the target men. Contrary to expectations, and inconsistent with the literature on human MC, men receiving signals of sexual interest from attractive female confederates were considered no more desirable than men who were not given signals. The author joined Uller and Johansson (2003) in suggesting that MC is likely a complex phenomenon.

The results of Study 2, especially when coupled with findings such as those reported above, further suggest that the phenomenon of MC (as it has come to be understood through a number of laboratory-based findings) is considerably nuanced. While 'in vivo'-type research necessarily comes at the cost of a loss of experimental control, in order to achieve a fuller understanding of this rich phenomenon future researchers may wish to consider more naturalistic studies. For example, many previous studies have presented either facial photographs (typically only headshots are provided), text based information, or both. Little is known about the occurrence of mate copying in real life, and the degree to which experimental methods have captured real-life processes is unclear. Although dynamic stimuli were employed in the current study, future research may wish to examine the phenomenon outside of the laboratory.

It was beyond the scope of the current research to examine whether or not mate copying varies as a function of how much information is provided. For example, as the strategy of mate copying is largely about gaining information that is not otherwise easily accessible, one could imagine that mate copying would be most likely when barely any other information is given (e.g. a really brief text-based description only) but less likely when a lot of real-life salient information is available (a real-life scenario).

An issue with both studies is that names associated with individual men were not randomised or counterbalanced. It is, for example, quite easy to imagine that a certain name may conjure a certain association for some women. The possibility that the name itself affected women's ratings of the desirability of the men cannot

be discounted. Future studies may wish to counterbalance name assignment, or eliminate this variable completely by describing individual men generically. Similarly, the terminology employed in the current research to describe an individual's romantic history (none, some, lots) was highly subjective. However, it allowed for the focus of the studies to be on the differences between the men, rather than their exact number of past relationships.

Within the human MC literature it has consistently been found that women rate potential romantic partners as more attractive if they have had relationship experience, or currently have a partner, than if they have had no relationship experience (Anderson et al., 2018; Eva & Wood, 2006; Platek et al., 2001; Waynforth, 2007).

Another common finding is that target men who have had a considerable amount of relationship experience are typically romantically disfavoured, partly due to fears of catching diseases from those with sexual prowess (Stewart-Williams et al., 2017) and/or a perceived unwillingness to commit to one woman (Anderson & Surbey, 2020). There is however somewhat of an ambiguity in the literature as target men who receive a moderate amount of romantic attention are assumed to be attractive/desirable (Hill & Buss, 2008; Scofield et al., 2019), but men who are promiscuous are less desirable (Anderson & Surbey, 2014; Stewart-Williams et al., 2017). The distinction is not always entirely clear. While previously literature suggested that the tipping point is somewhere between two and five previous partners (Anderson & Surbey, 2014), further research is required to ascertain the validity of this suggestion. The use of more dynamic stimuli in this future research may be warranted in the additional pursuit of identifying whether a change in modality alters the validity of MC.

While our understanding of the phenomenon of mate copying in humans has progressed considerably in the last 15 years, humans are such a profoundly complex species subject to immense variation in expression, behaviour, and cognition, and thus there is still an incredible amount of nuance yet to be adequately understood. Previous studies looking at mate copying in humans typically ignore the quality of the relationship described. While it may be easy enough to convey the simple idea that two people have either romantically separated or they are still in a relationship, the qualitative circumstances surrounding these statuses may well influence the assumptions one makes about a prospective partner (Anderson et al., 2018). For example, knowing that Jack and Jill have now broken up after having been together for 3 years provides some degree of information about Jack (and Jill), but better understanding the circumstances surrounding why they are no longer together seems relevant also. Perhaps Jack (or Jill) was abusive, and the entire relationship was tumultuous. Alternatively, it may be the case that their relationship was overwhelmingly mutually beneficial but they simply decided that they had different life goals and so they mutually agreed upon a separation. Future studies looking at the phenomenon of mate copying may wish to provide/manipulate information about relationship quality.

Authors Contribution Both authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Ryan Anderson and Ashleigh Armstrong. The first draft

of the manuscript was written by Ryan Anderson and Ashleigh Armstrong and both authors commented on previous versions of the manuscript. Both authors read and approved the final manuscript.

Funding Open Access funding enabled and organized by CAUL and its Member Institutions This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data Availability The datasets generated during and/or analysed during the current study are available in the Open Science Framework repository, https://osf.io/w7mpe/?view_only=933d227482f24e97a36d4422206c5dc

Declarations

Ethical Review This study received ethical approval from the Monash University Human Research Ethics Committee (approval number 22554).

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

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

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

Declarations of interest None

Employment Ryan Anderson was and is currently employed by Monash University, Ashleigh Armstrong was under his supervision whilst completing her honours degree.

CRedit Author Statement Ryan Anderson: Methodology, Writing-Reviewing and Editing, Formal Analysis, Supervision

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