# Mr. Popular: Effects of implicit and explicit social endorsement

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## Abstract

Humans are a social species with a high degree of information sharing. Character information is transferred between individuals frequently. Making a decision about who to mate with is one of the most consequential choices an individual makes, hence it pays to attend to any cheaply available mate-relevant information on offer. Building on previous research reporting a mating advantage for men romantically associated with women, here we present 3 studies examining the effects of being popular with the opposite sex. In all three studies men and women were presented with (and asked to evaluate) visual profiles of individuals of the opposite sex. Study 1 ($N = 294$) found that both men and women evaluate a man as more creative and socially skilled when he is attractive, and that women regard him as having higher mate value when his female friends are attractive. Study 2 ($N = 233$) found that men, but not women, considered profiles that were highly popular with the opposite sex to be more desirable. Study 3 ($N = 765$) found that neither men's nor women's desirability ratings of opposite-sex others were influenced by how popular that individual was with members of the opposite sex. It was concluded that while both men and women can be influenced by social information implicitly offered by others, this phenomenon is quite nuanced. Several possible theoretical and methodological explanations are considered, adding valuable knowledge to the existing body of research about mate copying propensity.

**Keywords** Mate value · Desirability · Attraction · Social influence · Mate copying · Popularity

**Highlights**

• Humans are a social species that take social cues from their peers about the quality of a prospective partner (mate copying)

• Using a series of online questionnaires, we found that the mate value a man has to prospective partners can be raised by simply being friends with attractive women

• Men, but not women, considered profiles that were highly popular with the opposite sex to be more desirable

• Following a hypothetical speed-dating event, neither men's nor women's desirability ratings of opposite-sex others were influenced by how popular that individual was with members of the opposite sex

• Merely being popular with opposite-sex individuals that don't know you is not enough to raise your mate value in the eyes of others

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## Introduction

Romance seekers largely interact with potential mates while in the company of friends (Ackerman & Kenrick, 2009). They found that 72.3% of young-adult interactions with prospective romantic partners take place in the company of a friend or acquaintance. Opposite-sex friendships also provide a number of benefits for both men and women. Therefore, it may be reasonable to suggest that natural selection at least partially guides the formation and maintenance of such friendships for men and women (Bleske-Rechek & Buss, 2001). Bleske and Buss (2000) noted that there is evidence indicating same-sex friendships are helpful in the context of mating, but have suggested that opposite-sex friendships may be even more helpful in this context by providing useful information about individuals of the opposite sex.

Single men often rely on the use of female friends or counterfeit girlfriends to increase their own attractiveness to the opposite sex (Ackerman & Kenrick, 2009). Female companionship may serve a further function in courtship, as men consorting with women may be considered less threatening. The pre-approval

bestowed upon them by their female friends may indicate that they are more acceptable, socially and romantically.

## Mate Copying and the Roles of Partner Attractiveness and Platonic Friends

Mate copying (MC) can be broadly defined as occurring when an individual indicates a heightened romantic preference for an opposite-sex other who has already been romantically chosen by another. Although this phenomenon has been well documented in nonhumans (for reviews see Brown & Fawcett, 2005; Galef & Laland, 2005; Vakirtzis, 2011), MC among humans has not been as well described. It is a useful sexual strategy in that the individual doing the copying effectively gets important mate-relevant information about a prospective partner, allowing them to make a better decision about whether to pursue a romantic relationship with them. This information is cheap to get, and essentially replaces costs typically associated with gaining this information in more expensive ways (time and energy that goes into dating for example) and thus this strategy has clear sexual utility. A man that has had previous romantic success, or even experience, presumably has at least some characteristics that are desirable to women. This is likely even more true if his past relationships have been with attractive women, as such women have a lot of choice over who they partner with (Singh, 2004; Waynforth & Dunbar, 1995). A man that has, by whatever means, secured the romantic affections of such a woman has presumably done so by virtue of being 'high quality' (variously defined) himself.

Research on human mate copy has thus far focused on romantic (sexual) relationships and how having a physically attractive romantic partner (former or current) influences women's perceptions of men. Studies confirm that, relative to having a physically unattractive partner, having an attractive partner increases a potential mate's attractiveness, perceived mate value and the occurrence of MC (Place et al., 2010; Vakirtzis & Roberts, 2012a; Waynforth, 2007; Zhuang et al., 2017). The relationship between men's increased attractiveness as a mate and having female friendships may be an effect synonymous to MC. Previous research has indicated that being in physical proximity to a woman can elevate a man's perceived desirability (a MC-like effect; Chu, 2012; Hanipraja et al., 2018). How the physical attractiveness of a man's female friends affects his own perceived desirability is unclear, and will be addressed in Study 1.

## The Benefits of Attractiveness

Although the social advantage linked with being physically attractive has been firmly established, profound gender differences exist. In the domain of romantic courtship,

physical attractiveness is consistently shown to be among the most sought-after characteristics in a female mate (Buss, 1989; Li et al., 2013; Singh, 1993). Kordsmeyer et al. (2018) have suggested that men are evaluated more on their social status/dominance and earning capacity. A man may be romantically or socially desirable without being highly physically attractive. Thus compared to a less attractive man, an attractive man is not only likely preferred as a romantic prospect, but he is also likely to be imputed with a range of socially desirable characteristics.

## The Attractiveness of a Man's Partner

Given the above it seems reasonable to suggest that being physically attractive yourself carries with it an array of socially desirable advantages, but there is also considerable evidence suggesting the physical attractiveness of the company you keep is socially relevant. Having a physically attractive partner (currently or previously) may confer upon an individual, especially a man, a similar range of social advantages. Although the importance of the physical attractiveness of one's associates was discussed as far back as 1973 (Sigall & Landy), our understanding of this effect, sometimes referred to as 'Mate Quality Bias' (Vakirtzis & Roberts, 2009), has only really come to the fore in recent years via research into the phenomenon of MC. Anderson (2018) examined a number of studies finding that a man's perceived mate value can be elevated when his romantic partner (former or current) is highly attractive, and decreases when his romantic partner is unattractive.

## Attracting Mates with Displays of Social Skill and Creativity

It is widely acknowledged that certain markers of social 'success' (status, dominance and likeability) are associated with increased romantic success and desirability, especially for men (Buss & Barnes, 1986; Kordsmeyer et al., 2018). To the extent that exhibiting signs of physical attractiveness and youthfulness (fertility) to potential partners enhances a woman's romantic desirability, so too is male desirability enhanced by indicating social dominance and the capacity to provide offspring with resources. Although male physical attractiveness is important in capturing the attention of a woman, there are many other qualities heterosexual women highly value in a long-term partner such as social status (Kordsmeyer et al., 2018; Li & Kenrick, 2006); honesty, kindness, and a sense of humour (Stewart et al., 2000). Together these can be loosely thought of as contributing to some kind of 'social skill'. It has also been suggested

that creative or artistic displays can attract potential partners (Griskevicius et al., 2006; Miller, 1999). Miller (1999) proposed 'cultural courtship' theory, wherein he advances the idea that creative cultural behaviour serves a far greater sexual function than many people care to admit. Cultural displays often have no clear survival benefit, yet are associated with substantial costs in terms of time and energy. Importantly, they require intelligence, health and creativity—hallmarks of adaptive ornaments crafted gradually by the process of sexual selection through mate choice. If such creative expression is favoured by women, it may follow that a creative individual would be more likely than a less creative individual to have won the favour of opposite-sex others and hence be accompanied by one or more of them at any given time.

## Goals and Hypotheses

Based on previous research concerning the "what is beautiful is good" perspective we predicted that physically attractive men would be perceived by both sexes as being more socially skilled and that women would perceive attractive men as having higher mate value than less physically attractive men or those of unspecified attractiveness. However, the additional consideration of a number of evolutionary phenomena and principles led to several more specific predictions. The primary goal of the study was to investigate whether the attractiveness of a man's female companions affected perceptions of his social skill, creativity and mate value in a manner similar to the attractiveness of previous mates, as has been found in MC studies (Anderson & Surbey, 2014; Bowers et al., 2012; Hanipraja et al., 2018; Rodeheffer et al., 2016; Street et al., 2018; Vakirtzis & Roberts, 2010, 2012a, 2012b; Waynforth, 2007; Yorzinski & Platt, 2010). It was expected that by virtue of being associated with an attractive (vs. unattractive) female friend, a man's perceived social skill, creativity, and mate value would be enhanced, paralleling a propensity for the woman evaluating him to mate copy.

## Method

### Participants

The sample comprised 213 female ($M_{age} = 25.93$ years, $SD_{age} = 10.73$ years) and 81 male ($M_{age} = 28.09$ years, $SD_{age} = 11.52$ years) heterosexual respondents, drawn from the James Cook University student body as well as the wider public. Psychology students participating in this study were awarded course credit for their participation, while non-psychology respondents were offered no incentives.

Participation was restricted to those between the ages of 18 and 40 as all target individuals appeared to be in their late 20's/early 30's and it was considered that too large a participant-target age discrepancy would be undesirable. Additionally, individuals who are 40 years of age or younger are likely to have maximal mating interest, and those above the age of 40 may be employing different assessment criteria.

Calculations by the power calculation program G*Power (Faul et al., 2007) indicated that the sample size of 294 was well in excess of the sample size needed to achieve power of .95 ($f^2 = .25$, $N = 28$), given that both independent variables in the current design were within-subjects (actual power > .99).

The majority of participants responded that they were either of European or Asian ethnic origin (55.6% and 23.9%, respectively). Additionally, 88.8% of respondents nominated English as their primary language, and 50.5% indicated that they were currently single.

### Materials and Measures

The questionnaire consisted of a demographics section (age, gender, ethnicity, etc.) followed by 15 scenarios including facial images of men and/or their female friends. Each scenario was additionally accompanied by a brief description of the man being evaluated. Although a total of 15 scenarios were used in the questionnaire, only six were 'target scenarios' subject to statistical analysis. The remainder were similarly presented but were used as distractor scenarios in an attempt to partially obscure the purposes of the study. The six target scenarios varied in the attractiveness of the man presented (low/unspecified/high) and the attractiveness of his female friend (low/high).

Photographs were allocated to conditions of high or low attractiveness according to the average attractiveness rating they received in a prior pilot study. For the pilot study 132 male and female students of JCU ($M = 24.95$ years of age, $SD = 9.28$ years) were presented with 45 facial images (23 men and 22 women) and asked to rate the attractiveness of each on a 10-point Likert scale from 1 ('not very') to 10 ('very'). The 45 facial images were presented one at a time (unaccompanied) in a randomised order. Facial images in the pilot study were generated with the use of the three-dimensional facial generation software FaceGen Modeller 3.5. All faces were constructed to look equivalent in age, and images were cropped at the neck and just above the eyebrows. This was an attempt to limit the effects of confounding variables such as clothing and hair style. Comments given by participants indicated that participants believed the facial images were realistic. From the 23 rated male faces in the pilot study, two of the most highly rated (5.87(1.74), 5.52(1.66)) and two of the lowest rated male faces (2.31(1.34), 2.38(1.51)) were used as stimuli for the main study. Similarly, three of the

most highly rated (5.99(1.74), 5.86(1.33), 6.05(1.89)) and three of the lowest rated (1.98(1.37), 2.12(1.44), 2.15(1.40)) female faces were used as stimuli in the main study. Twelve male and six female faces falling between the extremes were regarded as average and employed in distractor scenarios.

Four of the target scenarios consisted of pictures of both a male target and his female friend, and two additional target scenarios consisted only of pictures of a man's female friend (thus male attractiveness was unspecified). The latter conditions were included as an additional means to control for the physical attractiveness of the target men. This gave an overall 3 (male attractiveness) × 2 (female attractiveness) within-subjects design. The distractor scenarios were generally similar in format to the target scenarios, although in the distractor scenarios the number of photographs of men/women varied, as did the specific details of their association (*'Sue mentioned to a co-worker that she wants to date Ron').* Participants were able to freely comment at the completion of the study. None indicated that they were able to discern the aim of the study.

Each of the 15 scenarios (distractor and experimental) included both written text and pictorial stimuli of target men and their female friends, except for the condition of 'unspecified' attractiveness where men were not pictured with their female friends. In this condition, participants saw only the female friend and no information was provided about the target male's attractiveness in order to create a condition where attractiveness was not a factor, or could be assumed to be average. Pictures of female friends were either attractive or unattractive based on pilot study results. Participants were asked to respond to a series of 12 statements about each target man, with only the first nine of these completed by both men and women. In addition to the nine common questions, women responded to three unique items concerning the target males mate value. Employing a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*) participants indicated the extent to which they agreed with each statement. The nine items responded to by all participants concerned their perceptions of a man's level of social skill (e.g., 'This man is socially skilled') and creativity (e.g., 'This man is an artist'). The three items uniquely responded to by women formed a measure of mate value (e.g., 'I find this man romantically desirable'). Individual subscales were scored by taking an arithmetic average of responses to the items in that scale. Items were subject to data reduction techniques. Reliability data for each of these subscales is presented in the Results section of this study. An example vignette is provided in Fig. 1.

## Procedure

Participants completed the questionnaire online at a time and in a location of their choice. The questionnaire was administered by both the generic internet survey software tool SurveyMonkey (www.surveymonkey.com) and the JCU research software program (Sona). The questionnaire was made available to both undergraduate psychology students and members of the general public. Participants were recruited via advertisements made on social media sites and within the university research system. Participants were initially presented with information regarding the study and were issued the instruction 'please respond to all items as if you were currently single'. This was included to reduce the possibility of relationship status confounding the results. Additionally, all of the relationships between target men and their female friends were explicitly described as platonic. After responding to a series of demographic items, participants were asked to make various judgements about a number of men pictured or described in several conditions.

## Results

### Preliminary Analyses and Primary Descriptive Statistics

As this study involved a significant amount of related data, prior to hypothesis testing a number of data reduction techniques were undertaken. These techniques were also employed in an effort to determine whether the items used in the questionnaire clustered into the factors anticipated. To reduce the number of dependent measures analysed, the nine items completed by all participants were subjected to principal components analysis (PCA) using SPSS Version 20. The suitability of the data for factor analysis was assessed prior to performing PCA. As the sample size approximated the recommended minimum of 300 (Tabachnick & Fidell, 2001), the data were considered appropriate for factor reduction. The correlation matrix between these items indicated the presence of many coefficients above .3. Additionally, the Kaiser-Meyer-Olkin value of .9 exceeded the recommended minimum of .6 (Kaiser, 1974), and Bartlett's Test of Sphericity reached statistical significance ($p < .001$), thus further supporting the factorability of the correlation matrices (Bartlett, 1954).

Using the Direct Oblimin method of rotation, the PCA procedure revealed the existence of two positively correlated components ('social skill' and 'creativity', $r = .66$) with eigenvalues greater than 1, cumulatively explaining 82.34% of the variance. The 'social skill' factor consisted of five items assessing how socially skilled a man was (e.g., to what extent do you agree with the statement, 'This man is socially skilled'?). The 'creativity' factor consisted of four items assessing how likely the man is to be engaging in artistic/creative displays (e.g., to what extent do you agree with the

**Fig. 1** An example vignette from Study 1

**John**

Below are pictures of JOHN and his friend Rachel. John and Rachel are not in a romantic relationship. Please answer the following questions about JOHN by indicating your response according to the 7-point scale

1-----------2-----------3-----------4-----------5-----------6-----------7
Strongly Disagree                                                                 Strongly Agree



JOHN



Rachel

THE FOLLOWING 9 QUESTIONS ARE FOR BOTH MEN AND WOMEN

1.    This man is socially skilled ___
2.    This man will be financially successful ___
3.    This man is an artist ___
4.    This man is employed in an administrative role ___
5.    This man is a writer ___
6.    This man is a musician ___
7.    This man would be good to work with ___    8.    This man would make a good friend ___
9.    This man would make a good father ___

THE FOLLOWING 3 QUESTIONS ARE FOR WOMEN ONLY

10.    I find this man romantically desirable ___
11.    I think other women would find this man romantically desirable ___
12.    If this man asked me out I would say yes ___

THE FOLLOWING 3 QUESTIONS ARE FOR MEN ONLY

13.    I would be happy to set this man up on a date with one of my attractive female friends ___
14.    I would be hesitant to compliment or praise this man in front of women ___
15.    I am somewhat envious of this man ___

statement 'This man is an artist'?). Both components were shown to have adequate reliability, with Cronbach alpha coefficients of .95 and .91, respectively. Table 1 provides a summary of the PCA.

Each of the six men were rated by each of the participants. Prior to performing the factor analysis it was determined that each item highly inter-correlated across men (that is, bivariate correlations between each pairwise combination of each of the 6 target men, across each of the nine items: most $ps < .01$) and were thus combined (per item) to form a total of 9 overall items on which the factor analysis was done.

In addition to the two factors identified by the PCA (social skill – items 1, 2, 7, 8, 9 and creativity – items 3, 4, 5, 6), the three items uniquely responded to by women were examined. All inter-correlations were significant (all $ps < .001$) and thus a three-item female-only subscale ('mate value') with a Cronbach alpha coefficient of .87 was formed including the following items:

1. I find this man romantically desirable.
2. I think other women would find this man romantically desirable.
3. If this man asked me out I would say yes.

Analyses indicated that the majority of participants (81.8%) had been in at least one romantic relationship previously ($M = 4.19$, $SD = 2.87$). Although participants were asked to respond as if they were currently single and free to pursue a relationship, those currently in a romantic

**Table 1** Summary of principle components analysis of questionnaire (N = 294)

| | Rotated component loadings | |
|---|---|---|
| Item | Social skill | Creativity |
| 1. This man is socially skilled | 0.85 | |
| 2. This man will be financially successful | 0.82 | |
| 3. This man is an artist | | 0.92 |
| *4. This man is employed in an administrative role | | 0.50 |
| 5. This man is a writer | | 0.99 |
| 6. This man is a musician | | 0.90 |
| 7. This man would be good to work with | 0.95 | |
| 8. This man would make a good friend | 0.97 | |
| 9. This man would make a good father | 0.88 | |
| Eigenvalues | 6.32 | 1.09 |
| % of variance | 70.26 | 12.1 |
| α | 0.95 | 0.91 |

*Indicates that the item was reverse scored

**Table 2** Mean (SD) overall ratings of target men according to attractiveness

| | Attractiveness of female friend | |
|---|---|---|
| Measure | Low | High |
| Social skill | | |
|   Low male attractiveness | 3.54 (1.06) | 3.66 (1.12) |
|   **Unspecified male attractiveness | 3.72 (1.18) | 4.19 (1.02) |
|   *High male attractiveness | 4.44 (1.11) | 4.66 (.97) |
| Creativity | | |
|   **Low male attractiveness | 3.57 (1.26) | 3.26 (1.19) |
|   *Unspecified male attractiveness | 3.48 (1.26) | 3.72 (1.05) |
|   High male attractiveness | 3.58 (1.11) | 3.69 (1.08) |
| Mate value | | |
|   **Low male attractiveness | 1.98 (.96) | 2.12 (1.01) |
|   **Unspecified male attractiveness | 2.45 (1.26) | 2.77 (1.28) |
|   High male attractiveness | 3.72 (1.58) | 3.78 (1.38) |

*NB* While 'social skill' and 'creativity' were evaluated by men and women (combined), 'mate value' was evaluated by women only, * = $p < .05$ ** = $p < .01$

relationship and those who were not were compared across a number of dimensions to examine any consistent biases and determine the suitability of combining their responses. Single and non-single participants did not significantly differ on any of the dependent measures (all $ps > .01$) and were thus combined for analysis. Additionally, neither age, education, nor previous romantic experience, correlated with any of the dependent variables (for any of the six target men) and were thus not considered as potential covariates. Further, the

basic phenomenon of mate copying has been demonstrated across a range of cultures (many times in both Asian and Caucasian samples). There is no reason to assume that ethnic heritage makes a difference here. Table 2 gives descriptive statistics for each of the dependent measures depending on the attractiveness level of the female companions.

## Test of Predictions

A series of 3 (unattractive vs. unspecified vs. attractive male target) × 2 (unattractive vs. attractive female friend) within-subjects ANOVAs were conducted to determine the influence of male attractiveness and female friend attractiveness on a man's perceived social skill, creativity, and mate value (mate value judgments were made by women only). In ANOVAs where a violation of the assumption of sphericity occurred, the Greenhouse-Geisser correction was used and adjusted degrees of freedom are reported. It should be noted that for tests of both social skill and creativity, the main effects are observed are qualified by a higher-order interaction.

### Social Skill

There was an effect of male attractiveness, $F(1.94, 505.89) = 145.61$, $p < .001$, $\eta_p^2 = .36$. Bonferroni post-hoc comparisons indicated that attractive men were rated as being more socially skilled than either men whose attractiveness was unspecified, $CI = [.48, .74]$, or unattractive men both $ps < .001$, $CI = [.81, 1.11]$. The mean social skill rating for men of unspecified attractiveness was significantly higher than that of unattractive men ($p < .001$), $CI = [.23, .47]$. Additionally, men with an attractive female friend were considered more socially skilled than men with an unattractive female friend, $F(1, 261) = 38.45$, $p < .001$, $\eta_p^2 = .13$.

There was also a significant interaction between male attractiveness and female friend attractiveness, $F(2, 522) = 10.11$, $p < .01$, $\eta_p^2 = .02$. Results of a simple effects analysis further investigating this interaction showed that attractive men were rated as significantly more socially skilled/successful if their female friends were attractive than if they were unattractive, $F(1,313) = 14.39$, $p = .03$, $\eta^2 = .04$. Men whose attractiveness was unspecified were rated significantly higher if their female friends were attractive than if they were unattractive, $F(1,313) = 54.74$, $p < .01$, $\eta^2 = .15$. However, unattractive men were not rated differently depending on the level of attractiveness of their female friends, $F(1,314) = 3.52$, $p = .23$, $\eta^2 = .01$.

### Creativity

There was an effect of male attractiveness, $F(1.94, 505.46) = 7.29$, $p < .01$, $\eta_p^2 = .03$. Post-hoc comparisons indicated that the mean creativity score for attractive male

targets was significantly higher than that of unattractive male targets ($p < .01$), $CI = [.07, .38]$ but no different to that of male targets of unspecified attractiveness $p = .72$), $CI = [−.07, .20]$. The mean score for unattractive men was significantly lower than that of men with unspecified attractiveness ($p = .04$), $CI = [−.32, −.01]$. Men with an attractive female friend were considered no more creative than men with an unattractive friend, $F(1, 261) < .01$, $p = .97$, $\eta_p^2 < .001$.

There was a significant interaction between male attractiveness and female friend attractiveness, $F(2, 522) = 15.94$, $p < .001$, $\eta_p^2 = .06$. A simple effects analysis further investigating this interaction showed that attractive men were not rated differently depending on the level of attractiveness of their friends, $F(1,313) = 3.26$, $p = .46$, $\eta^2 = .01$, but unattractive men were regarded as more creative if their female friends were unattractive than if they were attractive, $F(1,314) = 18.35$, $p < .01$, $\eta^2 = .06$. Additionally, men of unspecified attractiveness were regarded as more creative if their female friends were attractive than if they were unattractive, $F(1,313) = 14.78$, $p = .02$, $\eta^2 = .05$.

### Mate Value

There was an effect of male attractiveness, $F(1.83, 339.57) = 212.40$, $p < .001$, $\eta_p^2 = .53$ such that attractive men were regarded as having significantly higher mate value than that of either unattractive men, $CI = [1.49, 1.95]$, or men of unspecified attractiveness (both $ps < .001$), $CI = [1.00, 1.43]$. Unattractive men were regarded as having lower mate value than that of men with unspecified attractiveness ($p < .001$), $CI = [−.67, −.33]$. Men with an attractive female friend were regarded as having significantly higher mate value than men with an unattractive female friend, $F(1, 186) = 11.93$, $p < .01$, $\eta_p^2 = .06$. There was not a significant interaction between male attractiveness and that of his female friend, $F(2, 372) = 1.23$, $p = .29$, $\eta_p^2 < .01$.

## Discussion of Study 1

It was found that physically attractive men pictured in varying conditions were considered more socially skilled and more creative than less physically attractive individuals. In addition, they were considered by women to have higher mate value. The finding that physically attractive individuals are credited with a range of desirable attributes is not surprising. A multitude of studies have documented the tendency of people to form an overall impression about something and then let that impression influence how they feel about other facets of that thing (Coombs & Holladay, 2006; Sine et al., 2003). Often this halo-type effect takes the form of observing a physically attractive individual, forming an

impression about them, and consequently positively assessing their personality (for a review see Eagly et al., 1991). However, to generate more specific predictions about the role of male attractiveness and that of their female friends in mate selection, the halo effects were expanded by applying the evolutionary concepts of MC, assortative mating, and sex differences in mate preferences.

### The Effects of Having Attractive Versus Unattractive Female Friends

The findings concerning the positive qualities attributed to men associating with attractive women (a type of indirect halo effect), have similarities with those reported in studies examining the phenomenon of MC. Whereas MC broadly involves a heightened romantic evaluation of an opposite-sex other because of their romantic association with opposite-sex others, the current study found a social and romantic advantage to platonically associating with attractive (vs. unattractive) opposite-sex others. This finding builds on previous findings that men are considered more attractive as mates if they are seen in the presence of women not overtly described as girlfriends, but presumably friends (see Hanipraja et al., 2018; Hill & Buss, 2008).

The results obtained from the current study generally indicate that both the physical attractiveness of a male target and his female friend are important in determining how a man is perceived. Sigall and Landy (1973) found that participants had an overall better impression of men when their female associate was attractive than if she was not attractive. However, this was only true when the female confederate was described as the girlfriend of the stimulus person. If she did not have a romantic connection to him her attractiveness did not affect people's judgement. It should be noted that in their study, although only men were assessed, male and female evaluations were combined.

A number of studies have indicated that sociability is highly favoured by women in a prospective partner (Buss & Barnes, 1986; Li et al., 2002). Physical attractiveness in women has long been recognised by men as a highly desirable mate-relevant quality (Buss, 1989; Buss et al., 2001; Dijkstra & Buunk, 1998; Feingold, 1992; Kurzban & Weeden, 2005; Margolin & White, 1987; Townsend & Levy, 1990). Thus, it would follow that desirable (physically attractive) women may assort with desirable (socially skilled) men; to put it another way, a man associating with a physically attractive woman could reasonably be assumed to be socially skilled.

### Mate Value and Relevance to Mate Copying

Regardless of their own level of attractiveness, men with attractive opposite-sex friends were regarded as having

higher mate value than men whose female friends were unattractive. Much of the literature concerning MC demonstrates a type of 'mate value enhancement' effect when a man is accompanied by a former or present female consort compared with when he is alone. The results of the current study, while not strictly demonstrating MC, extend previous findings by suggesting that the perceived mate value of a man can be elevated by mere *non-romantic* association with an attractive woman. Hence, merely befriending women, especially attractive women, may be enough to enhance one's mate value in the eyes of potential mates.

The present results suggest that women may attend to the friendship choices of other women, especially high mate value or attractive women, in a similar way to how they copy the mate choices of attractive women. Women of high mate value or attractiveness, presumably have many options available to them about with whom to associate. If such women have chosen to befriend or spend time with a man, it may be that he has at least some positive qualities that make him both a good friend and may generalize to his value as a potential mate.

Study 1 contributes to the literature uniquely by finding that men can alter their perception (in generally favourable ways) in the eyes of onlookers, by simply associating platonically with attractive women. Association with unattractive women is less favourable but may confer benefits in terms of perceived creativity. It is unclear how the perceived mate value of an individual varies depending on the quality of their friendship/relationship between the target and their implicit endorser. Studies 2 and 3 examined this by further removing the relationship between the two. There is certainly evidence to suggest that the *present* relationship between them need not be romantic for MC to occur (Anderson & Surbey, 2014; Yorzinski & Platt, 2010), and the current study establishes that an explicit romantic association with the model/implicit endorser is entirely unnecessary for an individual's perceived mate value to be modified. While it seems that endorsement from a single opposite-sex individual (who presumably has at least some emotional insight about the target men) can increase male mate-value, how an individual, male or female, is affected by multiple implicit endorsements from opposite-sex others (with less emotional insight) is unclear, and was investigated in Studies 2 and 3.

## Study 2

It is clear that individuals incorporate a range of available social information (e.g. peer attractiveness and facial expressions), into decisions about mate choice (Jones et al., 2007; Waynforth, 2007). Research also suggests that when individuals are confronted with ambiguous social situations, social heuristics are relied upon to increase accuracy in the decision-making process (Bowers et al., 2012; Pruett-Jones, 1992; Anderson, 2018). It has previously been observed that female attractiveness is used as a social heuristic to infer her male partner's unobservable positive attributes (Vakirtzis & Roberts, 2010; Waynforth, 2007). Study 2 considers whether or not popularity may be used in a similar way.

In a general sense, popularity is defined as a condition of being liked, admired or supported by many people. Popularity is commonly used as a social heuristic to infer positive attributes about someone or something (Cunningham et al., n.d.). Individuals high in popularity are perceived as having a great sense of humour, wealth and high social skills, an effect which has been termed the "popularity halo" (Cunningham et al., n.d.).

In Study 2 we examine whether an individual's popularity with the opposite sex may increase their (perceived) mate value and thus, their desirability. We define popularity here in a romantic sense, in terms of romantic interest from opposite sex others, whereby highly popular people are the recipients of romantic interest from a larger amount of opposite-sex others than less popular people. Using this definition, opposite-sex others who show romantic interest in a target may be perceived as endorsers of the target's quality, influencing the propensity to mate copy. Thus, popularity may be considered an important social cue for mate selection.

Research on MC has demonstrated that romantic interest from one same-sex peer can influence an individual's perceived desirability (Place et al., 2010). It would follow then that romantic interest from several peers may also be influential. However, little research has focussed explicitly on the effects of romantic popularity on MC. Little, Caldwell, et al. (2011a) did not manipulate the targets popularity but rather the popularity of his/her partner. They found that women rated men as more attractive when paired with popular women compared to less popular women. However, this study did not take into consideration gender differences and if the same effect would be found for men's ratings. Hill and Buss (2008) presented participants with images of opposite-sex others in three conditions (alone, surrounded by same-sex others, surrounded by opposite-sex others that were not showing any particular indications of romantic interest). It was found that while female desirability to males tends to be diminished by male attention, male desirability was enhanced by female attention.

### Goals and Hypotheses

Due to the limited research to date, it remains unclear as to whether the romantic popularity of the target may strengthen or diminish the desirability of men and women.

We manipulated the popularity variable by revealing the number of people (opposite-sex others) who indicated they

would like to go on a date with the target following a speed-dating event. It was hypothesized that:

1) women will find men depicted as popular with the opposite sex as more desirable than men depicted as less popular with the opposite sex (*desirability enhancement effect*)
2) men will find women depicted as popular with the opposite sex as less desirable than women depicted as less popular with the opposite sex (*a desirability reduction effect*).

## Participants

Participants included 233 heterosexual adults between the ages of 18 and 45. One hundred and five women ($M_{age} = 22.67$, $SD_{age} = 4.33$) and 128 men ($M_{age} = 25.2$, $SD_{age} = 5.29$) were recruited for the study via Facebook advertising. Participants predominantly resided in Australia (91.6%) but were ethnically diverse (Australian: 34.5%, Asian: 17.8%, African: 1.3%, European: 39.1%). The majority were currently single (55%) or in a dating relationship (25%). Upon completion of the survey, all had the chance to go into the running to win one of three AUD$50 Coles gift cards. Given the single between-subjects independent variable in the study (gender- two levels) the sample size of 233 was far in excess of that needed to achieve power of .95 ($f^2 = .25$, $N = 132$; Faul et al., 2007).

## Materials and Procedure

Study 2 was methodologically similar to Study 1 with a few key differences. Twelve standardised facial photographs (six male and six female) were selected from the Chicago face database (Ma et al., 2015). All selected photographs had been previously pre-rated for attractiveness. Those used in the current study had been categorized as averagely attractive. The attractiveness scores for male ratings of high popularity profiles ($M = 4.65$, $SD = 0.94$) and male ratings of low popularity profiles ($M = 4.57$, $SD = 1.09$) were not statistically different, $t(127) = 1.18$, $p = .24$. There was also no statically significant difference in female ratings of attractiveness of high popularity profiles ($M = 3.71$, $SD = 1.20$) and low popularity profiles ($M = 3.84$, $SD = 1.14$), $t(104) = -1.40$, $p = .17$.

Accompanying target photographs was the target's name and the following text used to manipulate the target's popularity with the opposite sex: "*Out of the 10 men/women that* [target name] *met,* [number of opposite sex others] *indicated that they would be interested in going on a date with him/her*". Target names used in the study for both males and females were popular Western names chosen at random. The number of opposite-sex others used to manipulate popularity was as follows: 2, 3, 4 (considered low popularity) and 7,

8, 9 (considered high popularity). Participants each viewed a total of 3 low popularity and 3 high popularity opposite-sex profiles (in a randomized order). After viewing each, participants were asked four questions about the targets' desirability as a romantic partner (e.g. "*How desirable is this person to you as a potential romantic partner?*"). Items were summed to form an overall desirability score for each person as questions within each condition were highly multicollinear (all correlations $p < .001$, all reliabilities $\alpha > .94$). In addition, the desirability of each of the three individuals in each of the 4 conditions (male/female * high popularity/low popularity) was summed (per condition) to give a more stable estimate of desirability. Hence final desirability scores are out of a possible 84. An example vignette is provided in Fig. 2.



**Fig. 2** An example vignette from Study 2

## Results

Mean desirability scores were calculated for each of the four groups and presented in Table 3 below. As can be seen in Table 3, male participants gave higher desirability ratings than female participants. Across genders, the desirability scores of profiles that were high in popularity were comparable to the desirability scores of profiles that were low in popularity.

A two-way mixed design ANOVA was conducted to explore the impact of popularity and gender on desirability. No higher-order interaction effect between gender and popularity was observed here, $F(1, 462) = 0.98$, $p = .755$, $\eta_p^2 < .01$, although male ratings of target desirability were significantly higher than female ratings of target desirability, $F(1, 462) = 59.60$, $p < .001$, $\eta_p^2 = 0.11$. There was no effect of popularity on desirability, $F(1, 462) = 1.64$, $p = .20$, $\eta_p^2 < .01$.

Follow-up paired sample t-tests revealed that males rated high popularity profiles as slightly more desirable than low popularity profiles, $t(127) = 2.66$, $p = .005$, Cohens $d = .15$. Females also rated high popularity profiles ($M = 43.1$, $SD = 14.9$) as more desirable than low popularity profiles ($M = 41.8$, $SD = 14.5$), however this difference did not reach significance, $t(104) = -1.15$, $p = .13$, Cohens $d = .06$.

## Discussion of Study 2

In stark contrast to expectations, the current findings suggest that men, instead of women, show a preference for popular opposite-sex others. Women's desirability marginally increased when her popularity with other men increased, which was unexpected given previous findings (Hill & Buss, 2008; Jones et al., 2007). However, women were not influenced by target popularity.

The current findings suggest that merely being popular with the opposite sex may not be enough to elicit an MC effect. The majority of studies demonstrating MC effects have examined the effects of current or previous romantic partners on the propensity to mate copy. In these studies, targets are typically pictured with women who are either explicitly identified as a current or previous romantic partner (Eva & Wood, 2006; Little et al., 2008; Rodeheffer et al., 2016) or are presented in a way that such a relationship would likely be assumed (Hanipraja et al., 2018; Hill & Buss, 2008). In contrast, the current study manipulated

popularity by presenting the amount of opposite-sex others interested in going on a date with the target. Although the desire to go on a date with the target indicates romantic interest in them, this may be too weak of an indicator to increase desirability. The indication of romantic interest may not be as influential to women's desirability judgements as when another woman has explicitly *chosen* the target as a romantic partner. Additionally, it was unclear how receptive that target may have been to any romantic offers. How he is perceived by women evaluating him, may to some extent depend on whether he has chosen to be romantically involved with a given woman.

Research has shown that women value romantic partners on the basis of how willing they are to commit (Anderson, 2018). Whereas selecting another as a romantic partner suggests a certain level of commitment, merely being romantically interested may not. Additionally, when women select a man as a romantic partner, it signals to other women that he has at least some of the unobservable qualities' women desire in a mate (Waynforth, 2007). Women who have previously romantically chosen a man are thus perceived to be endorsing his mate quality (Vakirtzis & Roberts, 2010). However, when women have an interest in a man but are uncommitted, her endorsement of him may not have as strong of an effect. Essentially, the endorsement is coming from someone not intimately known by the source and may therefore lack the knowledge required to influence others.

Study 2 found that male participants rated highly popular women as more desirable than less popular women. For women, there were no effects of manipulating a man's popularity with other women. Previous research examining the phenomenon of MC has largely focused on women (for a discussion see Anderson & Surbey, 2020). Less is known about whether or not men mate copy, and how they go about this. The findings reported here are consistent with previous research demonstrating that men's ratings of women's desirability increase when peer ratings of the target increase (Cunningham et al., n.d.), or when social information indicates a positive romantic interaction between the target and other men (Place et al., 2010). However, the findings of Study 2 are inconsistent with other research which has shown that women's desirability decreases when she is the recipient of attention from other men (Hill & Buss, 2008; Jones et al., 2007). Mixed previous findings may be due to methodological inconsistency but possibly suggest that the phenomenon of MC is nuanced and sensitive to minor perturbations, especially for men. Study 2 contributes to the literature in this area by suggesting that merely presenting text-based descriptions of opposite-sex interest may not be a strong enough manipulation to modify the perceived desirability of a man. Further research is required to better understand MC processes and any moderating variables that

**Table 3** Means (SD) Desirability scores of targets

| Popularity | | | |
| --- | --- | --- | --- |
| Participant Gender | High | Low | Total |
| Male | 53.7 (12.9) | 51.6 (14.5) | 52.6 (13.7) |
| Female | 43.1 (14.9) | 41.8 (14.5) | 42.5 (14.6) |
| Total | 48.9 (14.8) | 47.2 (15.2) | |

may influence the relationship, to reconcile these inconsistent results.

Previous research demonstrating MC effects has often visually presented a previous (or current) romantic partner alongside the target. The null findings of Study 2 may have been at least partially influenced by the fact the opposite-sex others who were romantically interested in the targets were not visually depicted. This absence may serve to reduce the salience of the information of romantic interest. In an effort to address this possibility Study 3 included conditions in which those romantically interested were displayed.

## Study 3

Study 3 was essentially a (partial) replication of Study 2 but with a few key methodological differences.

## Participants

Participants were 261 men ($M_{age}$ = 23.19 years, $SD_{age}$ = 5.93 years) and 504 women ($M_{age}$ = 22.76 years, $SD_{age}$ = 14.37 years) (N = 765) drawn from the JCU student body who were awarded course credit for their participation in the study. All were heterosexual and between the ages of 18 and 45 (see above). Participants were predominantly European (40.8%) or Asian (40.5%), with a smaller amount indicating that they were Aboriginal/Torres Strait Islander (3.9%) or from the Pacific Islands (2.1%). 54.5% of the sample indicated that they were in a relationship while 44.2% indicated that they were currently single. The sample size of 765 was in excess of the sample size needed to achieve power of .95 for 4 between-subjects conditions ($f^2$ = .25, N = 279)

## Materials and Procedure

Although Study 3 was methodologically similar to Study 2 (participants were given information about a hypothetical speed-dating event), in study 3 speed-daters (targets) interacted with a total of eight people of the opposite sex, and participants were told that either 0, 2, 4, or an unknown amount of people expressed an interest in going on follow-up dates with the target. Additionally, participants viewed a single scenario where the individual admirers of the target were presented alongside them (if randomly assigned to the '2' or '4' condition), and one in which they were not. Target stimuli were selected from the Chicago Face Database (Ma et al., 2015) on the basis that they had been pre-rated as slightly below average in attractiveness, while their admirers had been pre-rated as slightly above average attractiveness. All participants were asked to indicate how desirable each of the targets was. An example vignette is provided in Fig. 3. In this example vignette admirers are shown.

## Results

Table 4 gives desirability scores for opposite-sex targets when the admirers of the targets were not shown, depending on their popularity with the opposite sex and the gender of the person rating them (again participants only rated targets of the opposite gender).

As can be seen in Table 4, when admirers are not shown, desirability scores (out of 7) for men (rating women) seem to be higher than for women, but desirability scores for the various popularity conditions seem to be comparable.

While no higher-order interaction was observed here, $F(3, 757) = .49$, $p = .69$, $\eta_p^2 = .002$, inferential analyses confirm that men gave higher desirability scores than women, $F(1, 757) = 22.05$, $p < .001$, $\eta_p^2 = .03$. There was no effect of popularity, $F(3, 757) = .18$, $p = .91$, $\eta_p^2 = .001$.

Table 5 indicates desirability scores when admirers were shown.

Similarly, there was no interaction between the variables, $F(3, 757) = .27$, $p = .85$, $\eta_p^2 = .001$, but men gave higher desirability scores than women, $F(1, 757) = 14.68$, $p < .001$, $\eta_p^2 = .02$. There was no effect of popularity, $F(3, 757) = .59$, $p = .62$, $\eta_p^2 = .002$.

## Discussion of Study 3

The finding that men rated women as more desirable than the reverse is consistent with Study 2, and a considerable amount of other literature which suggests that men are generally more romantically interested in woman than the reverse (Buss & Schmitt, 1993; Schmitt, 2003). Similar to Study 2, popularity with the opposite sex was insufficient to elevate an individual's desirability. The null findings may suggest that merely having some kind of endorsement(s) from a stranger (who presumably has no knowledge of the person being evaluated) may be insufficient to meaningfully elevate an individual's perceived desirability. Alternatively, it may be that those expressing interest in the target were insufficiently attractive. Research into the phenomenon of mate quality bias suggests that desirability enhancement may depend upon the physical attractiveness of those romantically interested in the person being evaluated (for a discussion see Anderson, 2018). There is additionally some evidence that is the *difference* in attractiveness between the target and those romantically interested in them that is of importance (Waynforth, 2007). In the current study targets were selected on the basis that they had been pre-rated as being below average in attractiveness, and those that were romantically interested were slightly above, but this difference may have been inadequate.

**Fig. 3** An example vignette from Study 3

Daria

Below is a picture of Daria. We caught up with Daria after the event. Of the 8 men she talked to at the speed-dating event, 4 said that they wanted to go on a date with her (pictured below). Everyone involved in the event agreed to let us use their data. Please answer the following questions about Daria:



In general, how romantically desirable do you find this person? _

(1 = Extremely undesirable, 7 = Extremely desirable)

**Table 4** Mean (SD) desirability when admirers were not shown

| Participant Gender | Popularity | | | | |
| | Unknown | 0 out of 8 | 2 out of 8 | 4 out of 8 | Total |
| --- | --- | --- | --- | --- | --- |
| Male | 3.49 (1.09) | 3.25 (1.34) | 3.43 (1.08) | 3.41 (1.35) | 3.39 (1.22) |
| Female | 2.98 (1.18) | 3.02 (1.19) | 2.93 (1.18) | 2.94 (1.18) | 2.96 (1.18) |
| Total | 3.13 (1.17) | 3.10 (1.25) | 3.10 (1.17) | 3.11 (1.26) | 3.11 (1.21) |

**Table 5** Mean (SD) desirability when admirers were shown

| Participant Gender | Popularity | | | | |
| | Unknown | 0 out of 8 | 2 out of 8 | 4 out of 8 | Total |
| --- | --- | --- | --- | --- | --- |
| Male | 3.31 (1.14) | 3.09 (1.30) | 3.08 (1.14) | 3.19 (1.30) | 3.16 (1.22) |
| Female | 2.89 (1.12) | 2.81 (1.21) | 2.82 (1.19) | 2.75 (1.18) | 2.82 (1.17) |
| Total | 3.02 (1.14) | 2.91 (1.24) | 2.91 (1.18) | 2.91 (1.24) | 2.94 (1.20) |

## General Discussion

In this series of studies we sought to contribute to what is currently known about MC in humans by examining the role of popularity. In a time in which social media and dating applications are increasingly being used to meet potential mates, inspecting the social influence of popularity is incredibly relevant. Humans are making mating decisions on less and less information and as a result are reliant on using social heuristics to determine the quality of potential mates. Popularity may be particularly salient due to the large role it plays on many social media platforms, including Instagram, Facebook and Twitter. By examining the relationship between MC and popularity, we hoped to increase our understanding of the conditions under which a copying effect may occur. Further, we hoped to increase our knowledge of relationships and the social factors that contribute to their formation.

Study 1 found that attractive men were attributed positive qualities. Another crucial question examined in this study concerned how associating with attractive versus unattractive female friends influenced men's perceived level of social skill, creativity, and mate value (as assessed by women only). In line with predictions, men with attractive female friends were considered to be more socially skilled by both male and female raters, and were perceived as having higher mate value by female raters, than were men with unattractive friends. The evolutionary rationale for expecting the reported effects of female friends' attractiveness is specific to heterosexuals, however. On a broader level, nearly all previous empirical research on the topic of human MC has been conducted on exclusively heterosexual populations. A number of studies suggest that the value of male versus female physical attractiveness, may be similar but different in homosexual men and women (Ha et al., 2012; Jankowiak et al., 1992; Lippa, 2007). This dissimilarity may be driven largely by heterosexual men, who can discern a considerable amount of mate-relevant information from observing the physical quality of a woman (Anderson, 2018; Schulman & Hoskins, 1986; Singh, 1993). Observed MC effects (e.g. the effects of female friends' attractiveness) may be unique to heterosexuals.

That popularity with the opposite-sex had no effect on a person's desirability is somewhat surprising, and is generally inconsistent with the phenomenon of MC which suggests that romantic 'endorsement' by an opposite-sex other typically enhances an individual's desirability. Whereas in Studies 1 and 2, the operationalisation of popularity was quite broad, Study 3 took a more nuanced approach and found that categories of popularity did not differ.

In general, knowing someone socially or merely indicating a willingness to know them more (after a brief interaction) is presumably quite different from having had an intimate romantic association with them. The mate-relevant information someone can obtain from others that are simply attitudinally positive about someone (but do not necessarily have knowledge of their relationship-specific characteristics) is possibly insufficient to modify their desirability in any meaningful way.

It has been pointed out previously that the general strategy of MC makes more adaptive sense for women evaluating prospective opposite-sex mates than it does for men (Anderson & Surbey, 2020; Waynforth, 2007). The evolutionary argument for this asymmetry suggests that some qualities that men tend to look for in a mate (indications of health, youthfulness, fertility etc.) can be readily discerned from visual observation alone, whereas some of those sought by women (stability, parental ability etc.) are not as easily determined. Thus women are more interested in non-visual (character) information. The current set of studies reported either small or negligible gender differences. Taken together the results from the 3 respective studies offer some insight into the idea of perceived desirability, and the phenomenon of MC. It may well be the case that for an individual's perceived desirability to be meaningfully enhanced, an implicit 'endorsement' or 'pre-approval' needs to come from someone that already has good knowledge of this person. A friend or associate may be in this category, but a stranger may not know enough about this person to have any influence over their perception.

While there is a considerable body of literature suggesting that stated preferences predict later actions (Digelidis et al., 2003; Muir & Ogden, 2001; Spence & Townsend, 2006; but see Gilovich et al., 2006), recording actual mate choices would be desirable. Future investigations may wish to employ a more naturalistic design and in doing so augment our understanding of how people attend to information about a person implicitly offered by a third party. However, it should be noted that a number of researchers have already demonstrated MC or MC -like effects using speed-dating (Bowers et al., 2012; Place et al., 2010) and similar naturalistic methodologies.

What can be discerned is that while someone's perceived desirability can be influenced by other people with whom they associate, this is probably a very nuanced phenomenon and there are likely other factors involved. Future research may wish to look more closely at exactly how familiar an associate needs to be with an individual before they can meaningfully influence perceptions (especially romantic) surrounding that person.

## General Limitations

As is typical of research in this area, all three studies described here presented static, visually limited stimuli. Targets presented in cropped close-up photographs, make it difficult to visually assess a potential mate's body – particularly leanness, and height (Lu & Chang, 2012; Sell et al., 2017). Knowing about these dimensions offers potentially valuable information to prospective mates. Future studies in the general area of romantic desirability may wish to consider the presentation of more complete stimuli as to allow participants to make a more holistic assessment.

Additionally, the studies presented herein all suffered from a lack of naturalism. While there have been previous tests of mate copying using paradigms involving actual footage (Place et al., 2010; Vakirtzis & Roberts, 2012a), and even live interactions between men and women (Agnas, 2016; Uller & Johansson, 2003) there has been no research directly comparing MC-like effects for static versus dynamic footage. Given that desirability evaluations among humans would possibly involve observations of dynamic physicality, the presentation of static stimuli and text descriptions may be inadequate to fully understand the richness of this phenomenon.

## Conclusion

This sequence of studies makes an important contribution to our understanding of the phenomenon of MC, and interpersonal attraction more broadly. The findings of Study 1 are novel in that they extend upon our existing knowledge of MC, by suggesting that a man's desirability can be enhanced simply by the (platonic) company he keeps. Studies 2 and 3 provide a valuable contribution in that they essentially establish that popularity with the opposite sex alone is by itself inadequate to elicit MC like effects. Taken together, it seems reasonable to suggest that although MC occurs among humans, the phenomenon is very nuanced, and any model (or an associate of an evaluated individual) needs at least some degree of intimate knowledge about the evaluated individual.

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