



## The influence of model quality on self-other mate choice copying

Dawei Wang<sup>a</sup>, Shengqi Zhou<sup>a</sup>, Xiangwei Kong<sup>a</sup>, Dong Han<sup>a</sup>, Yixin Liu<sup>a</sup>, Lingchao Sun<sup>a</sup>,  
Wenxu Mao<sup>a</sup>, Phil Maguire<sup>b</sup>, Yixin Hu<sup>a,\*</sup>

<sup>a</sup> School of Psychology, Shandong Normal University, China

<sup>b</sup> Department of Computer Science, National University of Ireland, Ireland

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### ABSTRACT

We explored, through two experiments, the influence of model quality and gender on mate choice copying (MCC) behavior for oneself and for others. In the first experiment, we used a 3 (decision-making role: self, stranger, close friend)  $\times$  2 (gender: male, female) between-subjects design. The phenomenon of MCC was only found in females. There was no significant difference between making decisions for oneself and for close friends, but there was a significant difference between making decisions for oneself and for strangers. In the second experiment, we used a 2 (model quality: higher, lower)  $\times$  3 (decision-making role: self, stranger, close friend)  $\times$  2 (gender: male, female) mixed experimental design. Results showed an MCC effect under the condition of high-quality models for both males and females, but no MCC effect for low quality models, either for males or females. Again, there was no significant difference between making decisions for oneself and for close friends, but there was a significant difference between making decisions for oneself and for strangers. These results reveal that context is important for the manifestation of MCC behavior: both women and men are influenced by the choices of high quality models, but ignore the behavior of low quality models.

### 1. Introduction

Mate choice copying (MCC) refers to the behavior whereby an individual's mate-choice preference is affected by the preferences of a same sex competitor (Dugatkin, 2000; Dugatkin & Godin, 1992). Such behavior can reduce the cost of mate selection, and avoid potential loss caused by mate selection failure. By observing and imitating the behavior of other individuals who have succeeded in mate selection, the ability to distinguish between good and bad mates is enhanced (e.g., Gibson & Höglund, 1992; Nordell & Valone, 1998). Research on mate choice copying is valuable for understanding individuals' mate choice behaviors and strategies (Gouda-Vossos et al., 2018).

Previous research found that MCC is only observed in female samples (Gouda-Vossos et al., 2018; Zhuang et al., 2017), with males failing to display MCC (Hill & Buss, 2008). However, later studies have suggested that the phenomenon does exist to some extent in males (Little et al., 2008; Place et al., 2010). These mixed results regarding male MCC point to a need for further investigation.

For men, the main factor influencing successful reproduction is the acquisition of a fertile female who is young and healthy (Gallup Jr & Frederick, 2010). These physical characteristics are easily judged

through observation. By contrast, in order to maximize the survival of their biologically expensive offspring, women tend to seek out men who have abundant resources, and are willing to make long-term contributions towards raising offspring (Buss & Barnes, 1986). Although health, youth and genetic quality are easily accessible by observing physical traits, potential parental investment is much more difficult to assess. Making such selections with limited information depends largely on social cues (Burley, 1988; Qvarnström, 1997; Waynforth, 1999).

In recent years, studies on mate selection criteria have revealed that differences between men and women's standards for mate selection are gradually diminishing over time. Women tend to pay most attention to men's moral character, with lessening emphasis placed on men's social and economic status. Men have begun to focus more on indirectly observable qualities such as morality, personality and talent, paying less attention to women's appearance and health (Gan, 2007; Mare, 1991). These findings show that men are now placing greater importance on the qualities of potential mates that cannot be directly observed. Accordingly, the social information leaked by the opinions of male models should have an impact on men's perception of a woman's desirability (Li & Wei, 2016). We therefore propose the following hypothesis:

\* Corresponding author.

E-mail address: [huyixin2005@163.com](mailto:huyixin2005@163.com) (Y. Hu).

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**Hypothesis 1.** Both men and women perform MCC.

The MCC effect involves deriving social information from the behavior of others (Kavaliere et al., 2016). When it is difficult to judge the quality of a potential mate, the choice of other same-gender individuals (typically termed the “model”) may contain some indirect social information about that mate’s desirability (Dugatkin & Godin, 1992; Gierszewski et al., 2018; Place et al., 2010). The choices made by other competing same-gender individuals provide a public message to decision makers (Nordell & Valone, 1998). In addition, the characteristics of the model also provide relevant social information, and can influence the opinions of the decision maker (Li, 2017). For example, previous studies examining the characteristics of the model varied the attractiveness of the model, including facial attractiveness, body attractiveness and personality attractiveness. The results showed that the higher the attractiveness of model, the more easily MCC is triggered (Chu, 2012; Waynforth, 2007; Yorzinski & Platt, 2010).

Studies investigating the influence of a model’s characteristics on MCC have used a single mate desirability indicator, namely attractiveness (Vakirtzis & Roberts, 2012). However, in the process of mate selection, men and women have faced different adaptation problems and evolved differing mate-choice preferences (Buss, 1989). In light of this, a single indicator may not be sufficient to explore the effect. In our study, we use a more comprehensive index, namely model quality, to study the influence of the model’s characteristics on MCC. Previous studies on men and women’s mate selection preferences have shown that women are more willing to choose men who are enthusiastic, trustworthy, have higher status and possess abundant resources. Men, in contrast, prefer women who are attractive, healthy, energetic, and have an agreeable personality (Fletcher et al., 2004; Tang & Huang, 2005). Accordingly, in our study we stratify the quality of female models according to three indicators: appearance, figure and personal cultivation. The quality of male models is stratified according to social status, economic status and personal cultivation. Based on the above reasoning, we propose the following hypothesis:

**Hypothesis 2.** Model quality influences mate choice copying. Individuals will be more easily influenced by high-quality models to perform MCC, than by low-quality models.

Although Little et al. (2008) found that the MCC effect is greater when the model’s facial attractiveness is higher, previous studies have mostly used female subjects to explore the influence of model attractiveness on MCC, while few studies have been conducted using male subjects. Given that men and women have different evolutionary strategies for evaluating mate desirability, a more comprehensive index may be more suitable for investigating the MCC differences between men and women. We speculate that both men and women should be influenced by high-quality models to demonstrate MCC, while low-quality models should have no influence. In light of this, we propose the following hypothesis:

**Hypothesis 3.** Model quality and gender jointly influence MCC. Under the condition of high-quality models, there will be a significant difference between the MCC scores of males and females, while under the condition of low-quality models, there will be no phenomenon of MCC for either men or women.

Previous studies on MCC have been carried out from the perspective of mate-selection for oneself. In practice, people often seek the opinions of others in the actual mate selection process, such as parents, friends, siblings etc. The question therefore arises as to whether the MCC effect is demonstrated by people providing advice or choosing a partner for someone else, and whether it is manifested in the same way. Knowing this can allow a deeper understanding of the theories related to mate choice copying, which might have practical significance for guiding individuals’ mate selection behaviors, and improving the quality of the advice they give to others.

Many studies have investigated the differences between making decisions for oneself and for others, yielding inconsistent results across different fields. For example, in medical decision-making and in the political field, individuals are more cautious in making decisions for others than for themselves (Hibbing & Alford, 2005; Raymark, 2000). Yet in studies on risky decision-making in romantic relationships, individuals take more risks when making decisions for friends than for themselves (Beisswanger et al., 2003). Although these results are varied, a general finding is that in most cases, there are differences between making decisions for oneself and for others.

How can such differences be explained? Construal level theory proposes that, after integrating a variety of social information, people perceive a range of different psychological distances between themselves and others. Psychological distance refers to a cognitive separation between the self and other people, events, or time periods, which affects how those instances are represented (Baltatescu, 2014). If people perceive different psychological distances when making decisions for themselves and others, they will form different constructions, which may lead to differences in decision making (Chen & He, 2014; Fujita, Trope, Liberman, & Levin-Sagi, 2006; Trope & Liberman, 2000). For instance, when making decisions for friends who share a close psychological distance, people tend to rely on low-level constructions for the representation of objects and events, emphasizing the marginal, detailed local features. In contrast, when making decisions for strangers with a high psychological distance, people tend to use high-level constructions for the representation of objects and events, focusing on the core, generalized characteristics of the situation (Trope & Liberman, 2003). In light of this, we propose the following hypothesis:

**Hypothesis 4.** There will be significant differences in MCC scores when participants make decisions for themselves versus for others. When making decisions for themselves, MCC scores will be higher than when making decisions for strangers.

When people make decisions, their risk preferences are likely to change, not only based on whether they are making the decision for “themselves” or “others”, but also based on “who others are”. In the literature, the definition of “others” is relatively simple and superficial, mostly differentiating between specific and general others (e.g., Hsee & Weber, 1997; Stone & Allgaier, 2008), familiar and unfamiliar others (e.g., Hibbing & Alford, 2005), as well as other methods of manipulating social distance. Liu et al. (2014), however, has argued that the direct cause of the difference in making decisions for oneself and others is not social distance, but psychological distance. Although psychological distance can be related to social distance, they are not always the same. Therefore, it is more effective and reliable to measure psychological distance directly. Accordingly, we adopted the adapted the IOS scale (Aron et al., 1992; Niu et al., 2010) to manipulate the degree of emotional integration (i.e. psychological distance) between subjects and others, yielding the categories of ‘intimate other’ and ‘strange other’.

As previously mentioned, MCC is an adaptive strategy formed over a long-term evolutionary process, which can save on the costs of choosing a mate, and lower the risk of individual failure in mate selection. Choosing to imitate the preferences of high-quality models is the most risk-averse behavior, while imitating low-quality models may increase risk. The target favored by highly attractive people is likely to have high mate value, while the target of less attractive people may be less desirable (Li, 2017). In previous studies on risky decision-making in romantic relationships, it was found that individuals made riskier decisions for friends than for themselves (Beisswanger et al., 2003). In line with this observation, it may be the case that when making decisions for others, people are more likely to imitate low-quality role models. In light of this, we propose the following hypothesis:

**Hypothesis 5.** Model quality and decision makers’ roles will interact to predict MCC. That is to say, in the high-quality model condition, MCC scores in the “decisions for oneself” category will be higher than those in

the “decisions for a stranger” category, while there will be no significant difference between making decisions for oneself and for a close friend. In the low-quality model condition, however, there will be no MCC phenomenon, regardless of the decision makers’ roles.

To sum up, the following study explores the influence of model quality, gender and decision maker role on MCC via two experiments. In experiment 1, we explore the influence of decision maker roles and genders on MCC scores without manipulating the quality of the model. In experiment 2, the influence of model quality is introduced, and its effect on gender and decision maker’s role is explored.

## 2. Study 1: The influence of gender on MCC when making decisions for oneself and others

### 2.1. Method

#### 2.1.1. Participants

One hundred and fifty-eight Chinese undergraduate students ( $M_{\text{age}} = 18.62$  years,  $SD = 1.06$ , 50% females) participated in this study. In this study, all the participants indicated that they were heterosexual. The sample size was determined by detecting medium-size effect (effect size

$f = 0.25$ , type I error  $\alpha = 0.05$ , power  $1 - \beta = 0.8$ ) based on the G\*Power 3.1 calculation, which could ensure adequate power in our study. Each participant signed a written informed consent before the experiment and received 8 RMB after the experiment. Ethics approval was given by the Ethics Committee of Shandong Normal University.

#### 2.1.2. Materials

**2.1.2.1. Stimuli of MCC task.** Prior to the experiment, 40 males and 34 females assessed a set of color photographs (28 male photos, 39 female photos) of opposite-sex individuals for attractiveness (1 = unattractive, 7 = very attractive). All photographs featured only heads and shoulders.

Two medium attractiveness male photos (attractiveness score  $M = 2.84$ ,  $SD = 0.10$ ) and two medium attractiveness female photos (attractiveness score  $M = 2.60$ ,  $SD = 0.18$ ) were selected from the set of assessed photos. The people in the images were college students, and the photos were taken with their consent. Neither the participants nor the people in the images knew each other. The photos are shown in Fig. 1.

**2.1.2.2. Inclusion of Other in the Self Scale (IOS).** The Inclusion of the Other in the Self (IOS) Scale was originally developed by Aron et al.



Fig. 1. Mate choice copying task materials in experiment 1.

(1992). We used the adapted version revised by Niu et al. (2010). IOS is designed to measure the degree of psychological distance between the self and others. The scale has 7 double circles with increasing degree of intersections, used to describe the level of intimacy between oneself and others. For each pair of circles, one circle represents the subject and the other circle represents the other person. As the circles' overlap increases, so does their closeness, valued from 1 to 7. In this experiment, the role of decision maker was divided into self, stranger and close friend. For example, when the role of decision maker was "stranger", subjects were informed that they had to make a decision for a same-gender stranger. This relationship was presented as being illustrated by the pair of circles labelled as "1" shown in the figure below (completely non-overlapping, completely strange relationship). When the role of decision maker was "close friend", subjects were informed that they had to make a decision for a close same-sex friend, as represented by the pair of circles labelled "7" (fully overlapping, very close) (Fig. 2).

2.1.3. Procedure

The participants were randomly divided into three groups, with 52 people in the "decision for oneself" group, 56 people in the "decision for same-sex stranger" group and 50 in the "decision for same-sex close friend" group. In the decision for oneself group, participants were instructed to make decisions for themselves. In the decision for same-sex stranger group, participants were instructed to "Imagine a person of your own gender, with whom you have no relationship, as represented by Image 1 of the IOS scale. You have nothing to do with them. You're a complete stranger." Subsequently, participants were asked to make a decision for the stranger. In the decision for same-sex close friend group, participants were instructed to "Imagine a friend of the same sex with whom you have a very close relationship, as represented by Image 7 of the IOS scale, and recite their name in your mind". Participants were then asked to make decisions for this friend.

Participants entered a quiet lab individually. Two photographs of opposite-sex individuals were presented for each group. Participants were asked to evaluate the attractiveness of the individuals in the pictures, representing their willingness to accept them as a mate. Responses were recorded on a 7-point Likert scale, ranging from 1 (unattractive) to 7 (very attractive). Subsequently, the two opposite-sex photos were presented again, and participants were told that one of the photographed individuals was paired with a model, while the other was not. Finally, the two photos were again evaluated for attractiveness on a 7-point Likert scale, as shown in Fig. 3.

2.1.4. Design

In a between-subjects design, gender (male, female) and decision maker role (self, stranger, close friend) were the independent variables. The dependent variable was the MCC score. The formula for calculating MCC is shown below:

$$MCC = (S'_{model} - S') - (S_{model} - S)$$

S: mean of attractiveness scores in pre-test with no model; S': mean of attractiveness scores in post-test with no model; S<sub>model</sub>: mean of attractiveness scores in pre-test with models; S'<sub>model</sub>: mean of attractiveness scores in post-test with models.

2.2. Result

We performed a 3 (decision-maker role: self, stranger, close friend) × 2 (gender: male, female) ANOVA using SPSS19.0. The results showed

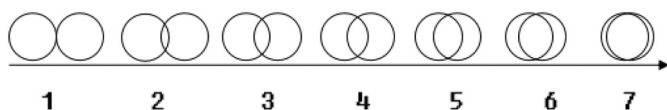


Fig. 2. The 7 sets of circles presented to participants at the same time.

How attractive do you think this person is?

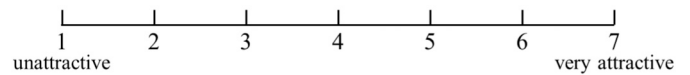


Fig. 3. Attractiveness evaluation scale.

that the main effect of decision-maker role was significant,  $F(2,152) = 3.64, p = 0.029, \eta_p^2 = 0.05, M_{self} = 0.49 (SD = 0.16), M_{stranger} = -0.06 (SD = 0.15), M_{friend} = 0.15 (SD = 0.16)$ . Following post hoc analysis, it was found that there was a significant difference between making decisions for oneself and strangers ( $p = 0.018$ ), while there was no significant difference between making decisions for oneself and close friends ( $p = 0.182$ ). The main effect of gender was significant,  $F(1,152) = 28.75, p = 0.000, \eta_p^2 = 0.16, M_{male} = -0.31 (SD = 0.13), M_{female} = 0.70 (SD = 0.13)$ . The interaction between decision maker role and gender was also significant,  $F(2,152) = 6.24, p = 0.009, \eta_p^2 = 0.06$ .

Simple effects analysis of the interaction between gender and decision maker role revealed that, for men, the difference for decision maker role was not significant ( $p = 0.888$ ), and there was no MCC effect ( $M = -0.31, SD = 0.13$ ). For women, there was no significant difference between MCC score for themselves and for close friends ( $p = 0.107$ ), but there was a significant difference between MCC score for themselves and for strangers ( $p = 0.000$ ). Specifically, the MCC score for themselves ( $M = 1.35, SD = 0.22$ ) was significantly higher than that for strangers ( $M = 0.07, SD = 0.21$ ) (see Fig. 4).

2.3. Discussion

The results of study 1 reveal a significant main effect of decision-maker role. Although there was no significant difference between making decisions for oneself and for close friends, there was a significant difference between making decisions for oneself and for strangers. According to construal-level theory, the difference in self-other decision making only appears when the psychological distance between oneself and others is relatively high (Liviatan et al., 2008; Trope & Liberman, 2003, 2010). As the psychological distance is reduced, the differences in decision making also diminish (Polman & Emich, 2011; Wang et al., 2019; Xu & Xie, 2011).

The results also reveal a significant interaction between gender and decision maker role. For women, there was no significant difference between making decisions for themselves and for close friends, but there was a significant difference between making decisions for themselves and strangers, in line with construal-level theory. Women may be more likely to discuss the topic of mate selection with their good friends. Therefore, when it comes to selecting partners, female subjects might have more experience and investment in making decisions for close others. For men, however, there was no significant difference in decision-making for themselves and for others, and there was no MCC effect.

In sum, we observed MCC in women but not in men. The lack of an effect for men is in contrast to our hypothesis. It does, however, support the findings of Hill and Buss (2008). Men who choose to date women who are married or already in a relationship have to pay more for dating, face intense same-gender competition, and may even pay the heavy price of raising the offspring of other men (Zhuang et al., 2012). We speculate that an alternative explanation for the lack of MCC in men is that knowing that a woman is already in a relationship offers little information. Because they carry a higher reproductive burden, women find it easier to attract mates, so just being in a relationship does not necessarily imply higher female desirability. Women have to go through the process of gestation, delivery and lactation, while men only need to invest in one-time sexual behaviors (Wang, 2011). Women are more cautious and picky when choosing partners, meaning that a man who

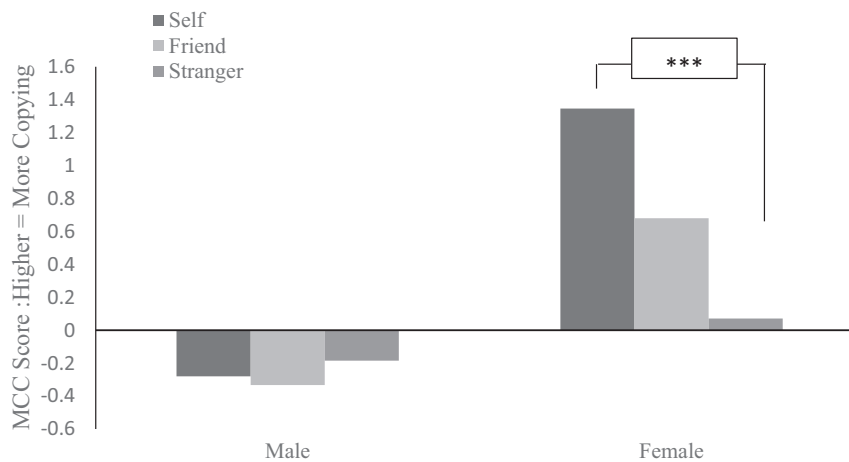


Fig. 4. Mean score of MCC as a function of gender and decision maker role.

has been accepted by any female partner is likely to have some good qualities. For men assessing the quality of potential female mates, further detail on the status of associated male models may be necessary to make an informed judgment. Thus, in experiment 2 we added additional context that could provide more insight for men on the quality of male models.

### 3. Study 2: The influence of gender and model quality on MCC when making decisions for oneself and others

#### 3.1. Method

##### 3.1.1. Participants

One hundred and seventy-four participants ( $M_{age} = 18.47$ ,  $SD_{age} = 0.74$ ) were randomly recruited from a Chinese university, including 87 males and 87 females. In this study, all the participants indicated that they were heterosexual. The sample size was also determined by detecting medium-size effect (effect size  $f = 0.25$ , type I error  $\alpha = 0.05$ , power  $1 - \beta = 0.8$ ) based on the G\*Power 3.1 calculation. Each participant signed a written informed consent before the experiment, and received 8 RMB after they finished the experiment. Ethics approval was given by Ethics Committee of Shandong Normal University.

##### 3.1.2. Materials

The same as Experiment 1.

##### 3.1.3. Procedure

All participants were randomly assigned to three groups, 58 in the “decision for oneself” group, 59 in the “decision for same-sex stranger” group, and 57 in the “decision for same-sex close friend” group.

Firstly, we divided our participants into the three groups. As in experiment 1, participants were asked to evaluate the attractiveness of the individuals in the pictures, representing their willingness to accept them as a mate. Responses were recorded on a 7-point Likert scale, ranging from 1 (unattractive) to 7 (very attractive). Subsequently, information about the model was presented. Participants were told that one of the people in the photos was paired with a high-quality model, and the other with a low-quality model. For the male participants, the first model was described as a “high-quality model” whose status, financial situation and personal accomplishments were higher than average. The second model was described as a “low-quality model” whose status, financial situation and personal accomplishments were lower than average. For the female participants, the model’s description was adjusted to refer to appearance and body shape, as opposed to status and financial situation. A pre-test featuring a 2 (the gender of the people evaluated: male, female)  $\times$  2 (description: social status and financial

situation, appearance and body shape) mixed experimental design established that there is no significant difference between the importance of men’s social and economic status versus women’s appearance and body shape as regards importance in choosing a mate. Finally, the original two pictures were presented to participants for a second time, and rated on the same 7 Likert point scale, as shown in Fig. 3.

#### 3.1.4. Design

In a mixed experimental design, the model quality (high, low) was a within-subject variable, while decision maker role (self, stranger, close friend) and gender (male, female) were between-subject variables. The dependent variable was the MCC score. The formula for calculating MCC is shown below:

$$MCC_{high} = S'_{high} - S_{high}$$

$$MCC_{low} = S'_{low} - S_{low}$$

$S_{low}$ : mean of attractiveness scores in pre-test with low-quality models;  $S'_{low}$ : mean of attractiveness scores in post-test with low-quality models;  $S_{high}$ : mean of attractiveness scores in pre-test with high-quality models;  $S'_{high}$ : mean of attractiveness scores in post-test with high-quality models.

#### 3.2. Result

We performed a 2 (model quality: higher, lower)  $\times$  3 (decision maker role: self, stranger, close friend)  $\times$  2 (gender: male, female) repeated measures ANOVA using SPSS19.0. We found that the main effect of model quality was significant,  $F(1,168) = 45.05$ ,  $p = 0.000$ ,  $\eta_p^2 = 0.21$ ,  $M_{higher} = 0.52$  ( $SD = 1.13$ ),  $M_{lower} = -0.21$  ( $SD = 0.98$ ). The main effect of gender was not significant,  $F(1,168) = 2.78$ ,  $p = 0.097$ ,  $\eta_p^2 = 0.16$ . The main effect of decision maker role was not significant,  $F(2,168) = 0.68$ ,  $p = 0.507$ ,  $\eta_p^2 = 0.01$ . The interaction effect between gender and decision maker role was not significant,  $F(2,168) = 1.57$ ,  $p = 0.211$ ,  $\eta_p^2 = 0.18$ . The interaction effect between model quality and decision maker role was significant,  $F(2,168) = 3.96$ ,  $p = 0.021$ ,  $\eta_p^2 = 0.05$ . The interaction effect between model quality and gender was significant,  $F(1,168) = 13.56$ ,  $p = 0.000$ ,  $\eta_p^2 = 0.08$ . The interaction effect between model quality, decision maker role and gender was not significant,  $F(2,168) = 1.42$ ,  $p = 0.244$ ,  $\eta_p^2 = 0.02$ .

Simple effects analysis showed that the role of decision maker had a significant influence in the high-quality model condition,  $F(2,171) = 3.46$ ,  $p = 0.034$ ,  $\eta_p^2 = 0.04$ . Specifically, the MCC score for making decisions for oneself ( $M = 0.78$ ,  $SD = 1.17$ ) was higher than that for making decisions for strangers ( $M = 0.24$ ,  $SD = 1.01$ ), but had no significant influence on the MCC score for making decisions for close

friends ( $M = 0.56$ ,  $SD = 1.17$ ). Under the low-quality model condition, there were no significant difference between the various decision making roles, and no MCC effect (see Fig. 5).

Simple effects analysis showed that the MCC score for women ( $M = 0.82$ ,  $SD = 1.17$ ) was higher than the MCC score for men ( $M = 0.23$ ,  $SD = 1.02$ ),  $F(1,172) = 12.45$ ,  $p = 0.001$ ,  $\eta_p^2 = 0.07$ , under the high-quality model condition. There was no significant difference between MCC score for men and MCC score for women,  $F(1,172) = 2.16$ ,  $p = 0.143$ ,  $\eta_p^2 = 0.01$ , and neither men ( $M = -0.10$ ,  $SD = 1.06$ ) nor women ( $M = -0.32$ ,  $SD = 0.90$ ) demonstrated MCC under the low-quality model condition (see Fig. 6).

### 3.3. Discussion

The main effect of model quality was significant. In the high-quality model condition, the MCC effect appeared, while in the low-quality model condition there was no MCC effect. According to the self-service bias theory, regardless of age, gender, race, economic status or religious background, most people feel superior to the average person in terms of virtue, ability to work, intelligence, etc. (Myers, 2013). It may be the case, therefore, that for most people, the behavior of low-quality models has no relevance.

The interaction between model quality and decision maker role was significant. In the high-quality model condition there was no significant difference in MCC score between decision-making for oneself and a close friend; there was, however, a significant difference in MCC score between decision-making for oneself and a stranger. This result is consistent with construal-level theory, which suggests that differences in choice will diverge in line with psychological distance (Liviatan et al., 2008; Trope & Liberman, 2003, 2010).

In line with our hypothesis, no matter whether the subjects were male or female, the MCC effect was observed in the high-quality model condition, and the MCC score difference was significant. However, neither males nor females demonstrated MCC in the low-quality model condition, with no significant differences in MCC scores. The results of our study are in line with the findings of previous studies. Examining long-term mate choice strategy, Little et al. (2008) found that when the model is highly attractive, both male and female subjects exhibit the MCC effect, while ignoring the behavior of low attractiveness models. Previous studies have shown that both men and women value positive personality traits highly in long-term partners (Buss & Schmitt, 1993). According to public information theory, when evaluating the quality of potential mates is difficult, the choices of others can be used to infer positive or negative traits that cannot be reliably identified from physical appearance alone, such as social resources and morality (Little et al., 2008; Nordell & Valone, 1998).

## 4. General discussion

This study explored the influence of model quality and decision maker role on the MCC effect. The observation of a decision maker role effect for MCC broadens the research field examining self-other differences in decision-making. In Study 1, women displayed a significant difference in MCC score when making decisions for themselves and strangers, but no significant difference when making decisions for themselves and a close friend. In Study 2, under the condition of high-quality models, there was no significant difference in the MCC score when participants made decisions for themselves and a close friend, but there was a significant difference when they made decisions for themselves and strangers. This finding is in line with construal level theory and previous studies (Polman & Emich, 2011; Trope & Liberman, 2003, 2010; Xu & Xie, 2011).

Conversely, under the male condition in Study 1 and the condition of low-quality model in Study 2, there was no phenomenon of MCC, and the differences in decision maker role were not significant. These results show that psychological distance is a necessary but not sufficient criterion for observing self-other differences in decision making. For example, there were no differences observed when there was no MCC effect.

Our study has reinforced the finding that MCC exists in women, as demonstrated in Study 1 and Study 2. These observations are consistent with previous studies (Eva & Wood, 2006; Hill & Buss, 2008; Jones et al., 2007). In addition, we have shown that, in order for the same effect to be observed in men, gender appropriate information on the quality of the models must be given. While there was no MCC effect observed in Study 1 for men, it appeared in Study 2 when male participants were given information about the models' status and achievements. In Study 1, the models had no description, but after defining the specific characteristics of the models in Study 2, an MCC effect emerged under the condition of high-quality models. Therefore, we can infer that MCC also exists in men, but it may depend on having more fine grained social reference information than in females.

In Study 1, the main effects of gender, decision maker role, and their interaction were significant. Yet, when model quality was clearly identified in Study 2, all three effects ceased to be significant. Model quality thus appears to play an important role in the MCC effect. According to the parental investment theory proposed by Trivers (1972), women carry the greater burden in child-bearing, and are thus more likely to be indiscriminately pursued. The presence of male models therefore carries much less information than the presence of female models. Men can directly observe whether women are young, attractive and healthy. Women, in contrast, must rely more on social information in assessing potential mate quality, and are more sensitive to such information.

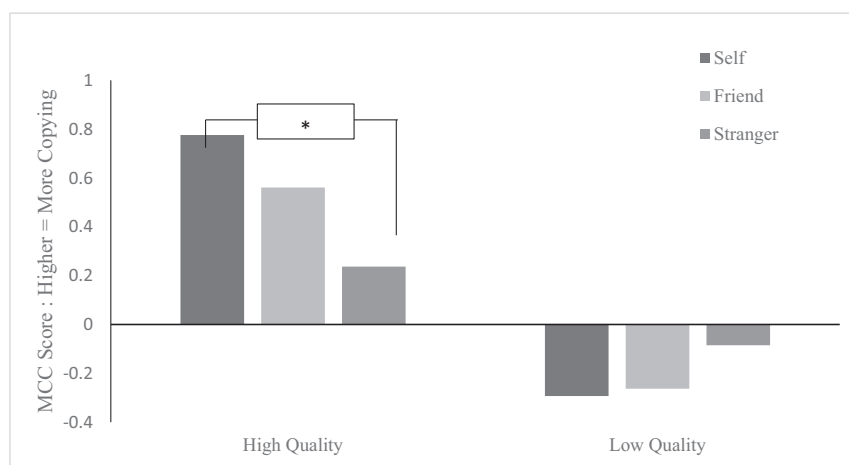


Fig. 5. Mean MCC score as a function of model quality and decision maker role.

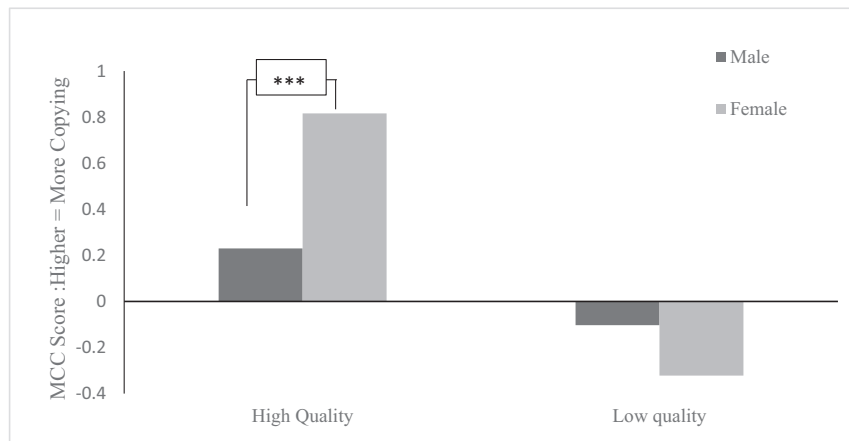


Fig. 6. Mean MCC score as a function of gender and model quality.

The presentation of a model without characteristics has little influence on the opinions of men, who can directly observe the desirability of a given woman and make judgments accordingly; they struggle to derive any information from the presence of a male model when the quality of that model is uncertain. Women, in contrast, find it more difficult to assess the quality of a given man, and are thus more easily influenced by the presence of a female model. Study 2 showed that, after adding detailed gender-appropriate information clarifying the quality of a model, men are also influenced in the same way, and exhibit MCC.

## 5. Limitations and future direction

In this study, the subjects were all students in first and second year of university. With such a narrow age span and limited coupling experience, the results may suffer from a lack of generalizability. Future research should aim to replicate these findings among a more diverse group of subjects, spanning across different ages and relationships.

In addition, the current research paradigm for exploring MCC is mostly based on photographs supplemented by textual clues to explain the relationships between targets and models. This form of presentation may suffer from a lack of ecological validity. Future research should aim to replicate the results using an alternative paradigm for presenting context-rich mate selection choices.

## 6. Conclusions

When a model is presented without specific characteristics, the MCC effect is observed in women but not in men. When models are clearly identified as high quality, in a gender-appropriate manner, then both men and women demonstrate MCC. When models are identified as low quality, no MCC effect is observed in either men or women.

For women, the difference in MCC when making decisions for themselves or for a close friend is not significant, while there is a significant difference in MCC when making decisions for themselves or for strangers.

## Disclosure statement

In these studies, we report all measures, manipulations and exclusions, and sample size was determined before any data analysis.

## Declaration of competing interest

All listed authors have no conflicts of interest. The manuscript was not been published before, and will not be sent for publication elsewhere.

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## Data availability statement

Research data are not shared.

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