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Research article

All you need is love: Is the sociometer especially sensitive to one's mating capacity?

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Abstract

Self-esteem has been proposed to serve as a sociometer, a gauge of one's value as a relationship partner. Based on evolutionary reasoning, we hypothesized that the sociometer is particularly sensitive to "capacity rejection" in the mating domain. Capacity rejection implies that one has low potential to be an acceptable mate now and in the future. In Study 1, participants received no feedback or negative feedback regarding their capacity for being an acceptable mate or friend. Although participants in both mate and friend conditions felt rejected, only those in the mate condition exhibited significantly lower state self-esteem. In Study 2, we examined sex differences in attributes relevant to mate capacity. Participants were given no feedback or negative feedback regarding their capacity as a mate: Some were told that their low mate capacity is due to their physical attractiveness whereas others were told it is due to their competence and status. Among men, state self-esteem was lower only after competence and status-based rejection; among women, state self-esteem was lower only after physical attractiveness-based rejection. In both studies, additional results revealed that even while self-esteem decreased, positive beliefs about the self were maintained, suggesting that feelings and beliefs about the self react differently to rejection. Copyright © 2009 John Wiley & Sons, Ltd.

It is well established that people are driven by a powerful need to belong, which presumably evolved because belonging to social groups and having romantic relationships heightened chances of survival and reproduction (Baumeister & Leary, 1995). Given the fatal implications of being a sole person without a mate, family, or group, it has been proposed that people possess a means of assessing the degree to which they are being accepted or rejected by others—the so-called *sociometer* (Leary & Baumeister, 2000; Leary, Tambor, Terdal, & Downs, 1995). State self-esteem is presumed to be the warning component of the sociometer: When accepted, people tend to hold high momentary feelings of self-esteem; when rejected, they tend to hold low momentary feelings of self-esteem (e.g., Leary, Haupt, Strausser, & Chokel, 1998). There is now substantial empirical evidence for the idea that self-esteem serves as a gauge of the degree to which one is being accepted or rejected within relationships—in other words, a gauge of one's *relational value* (for a review, see Leary, 2005).

Notwithstanding powerful effects of even minor rejection experiences (e.g., Williams, Cheung, & Choi, 2000), rejection experiences should predictably vary, as not all interpersonal relationships are equal. It seems plausible, for instance, that being rejected by a close friend will have a stronger and longer-lasting impact on one's well-being (and thus one's self-esteem) than being shunned by a stranger. Indeed, given that certain relationships (e.g., family relationships, friendships, romantic relationships, etc.) are especially important for one's well-being, one might speculate that the sociometer is particularly sensitive to rejection within those relationship contexts. In other words, self-esteem may be

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especially sensitive to rejection that has functional significance, rather than rejection *per se*. This idea is in line with the model of contingent self-esteem (Crocker & Knight, 2005), which suggests that self-esteem is contingent on specific domains of self-worth and that domains that are particularly important to a person have a larger impact and yield greater changes in self-esteem than less contingent domains.

A particularly important relationship domain—one in which people should be especially vigilant to possible rejection—is the romantic relationship. From an evolutionary point of view, mating relationships are vital, as they form the basis for reproduction, and thus finding a good mate is an important contributor to a person's reproductive fitness (Buss, 2003). Psychologically, highly intimate and stable bonds such as romantic relationships are particularly important to people and difficult to replace, because of their often high emotional commitment and intimacy (Leary & Baumeister, 2000). Indeed, existing evidence does suggest a robust link between self-esteem and acceptance in mating relationships in particular. For instance, self-esteem is predicted by one's self-perceived value as a mate and satisfaction with one's romantic relationship (Brase & Guy, 2004). Also, self-esteem is influenced by perceptions of one's spouse's regard (Murray, Griffin, Rose, & Bellavia, 2003). More to the point, a recent study found that the quality of one's romantic relationship predicted self-esteem more strongly than did the quality of one's kin relationships and friendships (Denissen, Penke, Schmitt, & Van Aken, 2008). Thus, to the extent that people possess a sociometer, it may be especially sensitive to one's relational value as a mate. One implication is that self-esteem may be differently impacted by rejection within mating versus non-mating relationship contexts.

The contention that the sociometer is especially sensitive to one's value as a mate is not unchallenged. Ample research has shown that the sociometer is sensitive to acceptance and rejection outside of mating relationship contexts (for a review, see Leary, 2005). It has also been suggested that from an evolutionary point of view different relationships pose different adaptive problems, so that multiple sociometers should monitor inclusion in functionally distinct relationships (Kirkpatrick & Ellis, 2001; Kirkpatrick, Waugh, Valencia, & Webster, 2002). It has furthermore been suggested that there is an attunement of self-esteem to specific traits depending on the salient social role (Anthony, Holmes, & Wood, 2007): Specifically, for people currently in a romantic relationship, self-esteem was defined more by possessing communal qualities such as kindness and understanding, whereas for people currently not in a romantic relationship, self-esteem was more attuned to social commodities such as appearance or social status.

The findings described above advance the sociometer concept. However, there remains a puzzle with regard to mate value. True, there may be different domains, and the sociometer is sensitive to different attributes in each domain. Yet, the quality of romantic relationships does seem to affect self-esteem more strongly than the quality of other relationships. And from an evolutionary point of view, it seems plausible that relationship domains themselves are not of equal importance with regard to the sociometer. Consider the following distinction: rejection by a mate or by a friend (what Leary, Springer, Negel, Ansell, and Evans (1998) call ''relational devaluation'' apt to create hurt feelings). What will have a stronger impact on self-esteem, the mate rejection or the friend rejection? Here, the context and the salient roles might be important, as suggested by Kirkpatrick & Ellis (2001) and by Anthony et al. (2007). However, what if one's general capacity to attract a mate was in doubt versus one's general capacity to attract friends? From an evolutionary point of view, one would hazard a guess that mating *as a relational domain* for the sociometer is more important than friendship as a domain, because if one is continuously rejected as a mate there will be no offspring even if one has friends. Thus, even though in any given instant having a friend may be more important than having a mate (say, for social support), when it comes to a general capacity contest between the two domains (projecting one's mate or friendship value into the future), the mating domain should win out. For this reason, the sociometer should react more strongly to a threat to one's capacities in the mating domain than to one's capacities in the friendship domain. To our knowledge, this possibility has not yet been directly addressed.

The manipulations that have been used to elicit feelings of rejection (or inclusion) vary substantially across studies. For example, in order to evoke feelings of rejection, Leary, Haupt, et al. (1998) had participants imagine that a date had answered questions about them with regard to their social desirability (e.g., wanting to sit next to participant, wanting to go to dinner or movie with participant). Negative answers would indicate rejection in that instant. By contrast, Twenge, Baumeister, Tice, and Stucke (2001) told participants via false feedback that they will end up alone later in life. This feedback tells participants something about their long-term capacity to maintain relationships. Our contention is that, with the latter manipulation, people may be particularly upset about exclusion from romantic relationships. However, Twenge et al. (2001) did not vary the domain to which the capacity applies. On the basis of what we argued above, there is a distinct possibility that the sociometer is attuned differently to capacity rejection in different domains. The present research set out to test this conjecture with regard to mating and friendship domains.

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The main objective of Study 1 was to assess the impact of what we call ''capacity rejection'' in different relationship domains (mating relationship versus friendship) on self-esteem. We expected self-esteem to be especially sensitive to capacity rejection within the mating relationship domain. In other words, we hypothesized that self-esteem would be lower following capacity rejection in the mating domain than following capacity rejection in the friendship domain.

Relationship status is likely to affect the workings of the sociometer when we deal with relational rejection (e.g., Anthony et al., 2007). Penke & Denissen (2008) have also shown that—at least for men—relationship status affects the strength of the correlation between self-reported mate value and self-esteem.[1] However, relational rejection and capacity rejection are not identical. If our reasoning is correct, then one's mating capacity ought to be so important that the sociometer should react to capacity rejection, even if one is currently in a romantic relationship. Thus, relationship status should not matter with respect to capacity rejection. In order to test this conjecture, we assessed relationship status in our studies and predicted that it will not affect the impact of capacity rejection on self-esteem.

According to an evolutionary psychological perspective, mating capacity of men and women depends on different attributes. Self-esteem should not just respond to capacity rejection in a mating relationship in general, but more specifically to one's being capacity rejected on the traits that contribute most to mate value. Men's desirability as a mate (compared with women's) seems more strongly dependent on traits associated with competence and social status whereas women's desirability (compared with men's) seems more strongly dependent on traits associated with physical attractiveness (e.g., Ben Hamida, Mineka, & Bailey, 1998; Buss & Schmitt, 1993; Li, Bailey, Kenrick, & Linsenmeier, 2002). Thus, young men and women may be especially sensitive not only to capacity rejection within mating relationships (compared to friendship relationships) but also to whether the rejection experience targets their most important trait as a mate. For a man, rejection due to his (low) competence and status may be especially informative of his relational value, with the implication that his self-esteem may be influenced especially strongly by capacity rejection based on competence and status. For a woman, rejection due to her (low) physical attractiveness may be especially informative of her relational value, with the implication that her self-esteem may be influenced especially strongly by capacity rejection based on physical attractiveness. Accordingly, a second objective of the present research (Study 2) was to assess the impact of different reasons for capacity rejection. We hypothesized that (a) men's self-esteem would be lower following capacity rejection based on competence and status, and (b) women's self-esteem would be lower following capacity rejection based on physical attractiveness.[2]

Intriguingly, there may be a separation between people's feelings and beliefs regarding the self, and that difference may become especially relevant in situations of capacity rejection. Together, feelings and beliefs about the self constitute a person's self-concept; they are affective and cognitive representations about a person's identity and abilities. A person's self-concept includes an important affective–evaluative component (i.e., self-esteem or feelings regarding the self) and beliefs about the self pertain to one's abilities or commodities. Feelings and beliefs about the self are often highly related, but are not equivalent. People can believe that they are very attractive, but need not feel attractive at all times—for example, when having a stressful day, a person may feel less attractive and experience a drop in self-evaluative feelings (i.e., state self-esteem). Such incidents do not necessarily change a well-established belief of being attractive. Only if the person continues to feel unattractive for a longer period of time might beliefs about lack of attractiveness be adopted. If many individually important beliefs are lowered, this in turn may influence a person's general feelings regarding the self (i.e., trait self-esteem). The same logic may apply to one's mate value (i.e., one's belief regarding one's capacity in the mating domain) in light of a capacity rejection experience. Thus, although people may experience a drop in self-esteem following rejection, they may nevertheless maintain positive beliefs about their qualities.

Indeed, holding overly positive beliefs about one's qualities (i.e., ''positive illusions'') has been proposed to be an adaptive tendency, both psychologically and reproductively (Haselton & Nettle, 2006; Taylor & Brown, 1988). Holding extreme self-beliefs (narcissism) may be self-defeating and lead to aggression. However, narcissists have unstable self-beliefs, and it seems that those who can maintain stable self-beliefs are least prone to self-defeating behavior after rejection

[1]They used a mixed measure of mate value that was based on self-assessed reactions of the opposite sex as well as physical attractiveness and intellectual/academic ability. Even though their measure contained some general capacity items, it did not have any reference to the future or to rejection experience.
[2]It has recently been argued that the sex difference in preference for competent/high-status or physically attractive mates—often found in studies of stated preferences—may be more reflective of people's a priori theories regarding what make desirable mates and may not necessarily translate into behavior when selecting mates (Eastwick & Finkel, 2008). Because sociometer theory implies that people's self-esteem depends on their *perceived* relational value, people's self-esteem may be influenced more by what they perceive to be relevant to mate value rather than what is objectively relevant. In other words, even if men and women do not actually select mates based on physical attractiveness and competence/status, respectively, their perception that the opposite-sex members will employ these criteria may impact their self-esteem in the hypothesized manner following the specific forms of rejection.

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(see Baumeister, Bushman, & Campbell, 2000). The maintenance of positive beliefs may be essential for motivating functional approach behavior (e.g., flirting with a potential mate). As rejection may trigger negative feelings that functionally interrupt behavior to allow appraisals of the situation (e.g., Frijda, 1986), positive illusions may complement the sociometer by motivating compensatory approach behavior, and such beliefs may be especially beneficial following capacity rejection. If such a functionality of positive beliefs exists, they may be conceptually distinct from the feelings that one has about oneself. In other words, even though capacity rejection experiences may lead to lower self-esteem, people may continue to maintain positive beliefs about their qualities. To consider this hypothesis and control for the effects of such beliefs, we assessed self-esteem as well as beliefs about the self in both of our studies.

STUDY 1

In Study 1, participants were given false negative feedback following an inventory that ostensibly measured their capacity as a mate or as a friend. Learning that they have a low capacity as a mate was expected to lower participants' state self-esteem more than learning that they have a low capacity as a friend. In addition to assessing state self-esteem following the rejection manipulation, we also assessed the impact of relationship status and whether people maintain positive beliefs about the self.

Method

Participants and Design

One hundred thirty-six students (90 women, 46 men; mean age = 20.14, $SD = 3.13$) from the University of Groningen participated in exchange for partial course credit. Participants were randomly assigned to the *mate-capacity-rejection* condition, the *friend-capacity-rejection* condition, or the control condition. Participants completed the study sessions within separate cubicles where all materials were presented on computers in Dutch.

Procedure

The study was described as an investigation of the relationship between different aspects of the self-concept and the so-called ''Social and Mate Value Inventory,'' which participants were told is a test that is frequently used to assess people's qualities as a friend or a mate. After having answered some general questions about their age, gender, and relationship status (i.e., ''Are you currently in a relationship?''), participants assigned to the experimental conditions (mate capacity rejection or friend capacity rejection) completed a questionnaire in which they were provided with several statements (e.g., ''I am mostly the one who initiates a social interaction,'' ''I never worry about my looks,'' ''I prefer not to be responsible for other people's feelings'') and were asked to indicate the extent to which they applied to them on a 5-point scale (endpoints labeled *1 = does not apply to me at all, 5 = does very much apply to me*). Participants assigned to the control condition did not complete this questionnaire and received no feedback; they performed a word-search task instead in which they had to create animal names from scrambled letters that were presented on the computer screen.

After they had completed the questionnaire, participants in the two experimental conditions read that the computer would now calculate the results of the inventory. A small clock appeared on the screen and they were asked to wait until the computer had finished calculating their score on the test. Participants' feelings of rejection were manipulated by giving them one of two versions of negative feedback (using methods from previous assessments that introduced capacity rejection, such as Maner, DeWall, Baumeister, & Schaller, 2007; Twenge et al., 2001; see Appendix A). Those assigned to the mate-capacity-rejection condition were told that they had an average score on social qualities, implying an average probability that they will have many good friendships in life, but that they had a *low score on mate value*, implying a low probability that they will have a good and fulfilling relationship and a high probability of frequent rejection by potential romantic partners in the future (the assessment ended with the sentence ''Even if you are in a relationship now, this will

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change, and the older you get the more likely it will become that you will end up without a partner later in life''). Participants assigned to the friend-capacity-rejection condition were told that they had an average score on mate value, implying an average probability that they will have good and fulfilling relationships in life, but that they had a *low score on social qualities*, implying a low probability that they will have many good friendships and a high probability of frequent rejection by possible friends in the future (ending with ''Even if you have many friends now, this will change, and the older you get the more likely it becomes that you will end up without any friends later in life''). Thus, participants in the two experimental conditions were given feedback that was intended to induce feelings of low capacity in a specific relationship domain—either as a mate or as a friend.

Following the experimental manipulation, participants completed a measure of beliefs about their qualities and a measure of state self-esteem. The order in which these two measures were presented was counterbalanced (there was no effect of order).

In the measure of beliefs about qualities, participants were asked to evaluate their own current mate and social qualities. For female participants in the mate condition, being a desirable mate was described as someone who is ''sexy and beautiful''; for male participants in the mate condition, being a desirable mate was described as someone who is ''competent and athletic.'' Participants were asked, ''Compared to your average peer, how desirable are you as a mate?'' Responses were provided on a 7-point scale (endpoints labeled *1 = not at all, 7 = very*). For both female and male participants in the friend condition, a social person was described as an ''honest, cooperative, and trustworthy friend.'' Participants were asked, ''Compared to your average peer, how social are you?'' Responses were provided on a 7-point scale (endpoints labeled *1 = not at all, 7 = very*). These questions were intended to assess the extent to which people might hold positive beliefs about their qualities as a mate or friend—separate from state self-esteem—following the capacity-rejection manipulation.

The measure of state self-esteem served as our primary dependent variable. Following McFarland & Ross (1982), participants were asked to indicate the extent to which 12 self-relevant emotions (i.e., proud, competent, self-assured, smart, resourceful, effective, efficient, inadequate, incompetent, stupid, worthless, and ashamed) applied at the moment; responses were provided on a 7-point scale (endpoints labeled *1 = not at all, 7 = very much*).

Finally, as a manipulation check, participants completed five questions about ''experienced rejection'' (''Did you feel valued/accepted/excluded/rejected/hurt after the first part of the study?'' Responses were provided on a 7-point scale (endpoints labeled *1 = not at all, 7 = very much*).

Upon completion, participants were thoroughly debriefed. Special care was taken to ensure that none of the participants suffered any distress or harm as a result of the experimental procedure.

Results

Manipulation Check

Did the manipulation bring about feelings of experienced rejection? For this purpose, a single index of feelings of rejection was created by coding the items so that higher scores indicated stronger feelings of rejections (Cronbach's $\alpha = .86$). A one-way analysis of variance (ANOVA) revealed that feelings of rejection were influenced by the manipulation, $F(2, 133) = 36.35$, $p < .01$. Bonferroni *post hoc* tests revealed that participants in the mate-capacity-rejection ($M = 4.33$) and the friend-capacity-rejection ($M = 4.23$) conditions felt more rejected, compared with participants in the control condition ($M = 2.51$, both p's $< .01$). In other words, participants in both rejection conditions felt rejected, irrespective of the specific relationship domain.

Effect of Rejection Manipulation on State Self-Esteem

To test the effect of the capacity-rejection manipulation on state self-esteem, we first created a single self-esteem index by reverse-coding the negative feelings so that higher scores indicate higher state-self-esteem and then averaging across the 12 self-relevant feelings ($\alpha = .89$). A 2 (participant sex) $\times$ 3 (condition) ANOVA revealed a main effect of sex, $F(1, 130) = 9.31$, $p < .01$, partial $\eta^2 = .07$, and a main effect of condition, $F(2, 130) = 7.97$, $p < .01$, partial $\eta^2 = .11$; there was

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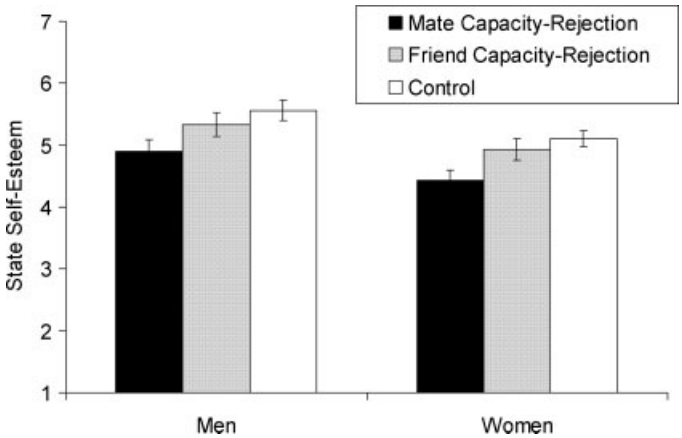

Figure 1. Effect of manipulation (mate capacity rejection, friend capacity rejection and control) on state self-esteem in men and women (errors bars indicate $\pm SE$)

no interaction effect ($p = .98$; see Figure 1). On average, men ($M = 5.27$) indicated higher self-esteem than women ($M = 4.84$, $d = .54$). Bonferroni *post hoc* tests revealed that participants in the mate-capacity-rejection condition ($M = 4.60$, $SD = .85$) reported significantly lower self-esteem than participants in both the friend-capacity-rejection condition ($M = 5.05$, $SD = .85$, $p < .05$ $d = .53$) and the control condition ($M = 5.26$, $SD = .74$, $p < .01$, $d = .83$). Self-esteem in the friend-capacity-rejection and control conditions did not differ ($p = .64$).

Does the Effect Remain after Controlling for Feelings of Rejection?

Feelings of rejection (from the manipulation check) were substantially correlated with state self-esteem, $r(134) = -.53$, $p < .01$, suggesting the possibility that the effect of the manipulation on self-esteem may be explained by feelings of rejection. We thus conducted an analysis of covariance (ANCOVA) in which experimental condition was entered as an independent variable, self-esteem was entered as the dependent variable, and the rejection index was entered as a covariate. The results showed that although the effect size was smaller, the effect of condition remained significant, $F(2, 132) = 4.05$, $p < .05$, partial $\eta^2 = .06$, indicating that the rejection manipulation has a direct effect on self-esteem, which is not fully explained by feelings of rejection. Thus, in addition to feeling rejected, there seems to be an effect of low mate capacity on self-esteem, which is consistent with the view that self-esteem serves as an index of relational value.

Does Relationship Status have an Effect on State Self-Esteem?

To test our hypothesis that relationship status has no effect on people's state self-esteem, we conducted an ANOVA with relationship status and the rejection manipulation entered as independent variables. The results revealed neither a main effect of relationships status, $F(1, 130) = .08$, $p = .78$, partial $\eta^2 < .01$, nor an interaction effect between the rejection manipulation and relationship status, $F(2, 130) = .19$, $p = .83$, partial $\eta^2 < .01$. The effect of the capacity-rejection manipulation remained significant ($p < .01$), suggesting that capacity rejection affects self-esteem irrespective of relationship status.

Positive Beliefs about the Self

Does capacity rejection influence positive self-beliefs? A pair of one-way ANOVAs revealed that, as expected, the manipulation had no effect on people's beliefs about their qualities as a mate, $F(2, 133) = .40$, $p = .67$, partial $\eta^2 < .01$, or a friend, $F(2, 133) = .63$, $p = .54$, partial $\eta^2 < .01$. In other words, people maintained positive beliefs about their qualities

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(both means were above the scale midpoint of 4; both p's $< .01$) even while experiencing a drop in self-esteem. Positive beliefs about quality as a mate and as a friend were positively correlated: $r(136) = .39$, $p < .01$.

To test whether the drop in self-esteem occurs independently of these positive self-beliefs, we conducted an ANCOVA in which experimental condition was entered as an independent variable, self-esteem was entered as the dependent variable, and the positive beliefs were entered as covariates. The results showed that the effect of condition remained significant ($p < .01$).

Discussion

The results of Study 1 showed that state self-esteem decreased only after feedback indicating lower mate capacity. Self-esteem in the friend-capacity-rejection condition did not differ from self-esteem in the control condition (even though people clearly felt rejected in both rejection conditions, as indicated by the manipulation check). Additional results showed a direct effect of the manipulation on self-esteem, which could not be fully explained by feelings of rejection. The effect was also independent of any positive beliefs that people maintain following rejection—in the light of rejection, positive beliefs and self-esteem appear to operate independently of each other. In sum, the results were consistent with our hypothesis: The sociometer is especially sensitive to one's capacity in the mating domain. Note that this effect occurred even though participants were told that they had an average level of success in friendship relationships. This is not to say that friendship does not matter for the sociometer; however, low friendship capacity does not seem to be so threatening as long as people have an average level of success in mating relationships. Thus, high mating capacity seems to be able to compensate for average friendship capacity, but not vice versa.

STUDY 2

In Study 2, we extended the findings of Study 1 by focusing on an even stronger functional-specificity effect: the attributes on which one is rejected. Thus, we did not compare the effect of capacity rejection on (state) self-esteem in the mating versus other domains. Rather, we compared within the mating domain the effect of capacity rejection with regard to attributes that can be taken to be more or less central to mating capacity for the different sexes. As noted above, the (perceived) mate value of men and women has been found to depend on different characteristics. In Study 2, we provided feedback indicating low mate capacity on the basis of characteristics that are highly relevant or less relevant to mate value for each sex. Specifically, we provided participants with one of two bases for capacity rejection: status and competence, or physical attractiveness. We hypothesized that (a) men's (state) self-esteem would be lower following capacity rejection based on competence and status than following capacity rejection based on physical attractiveness and (b) women's self-esteem would be lower following capacity rejection based on physical attractiveness than following capacity rejection based on competence and status. Again, we tested the hypothesis that relationship status has no effect on the link between capacity rejection and state self-esteem. We also tested the hypothesis that positive beliefs about oneself as a mate would not be affected by capacity rejection.

As a further extension of Study 1, we also looked at the effect of trait self-esteem prior to introducing the manipulation. Trait self-esteem and state self-esteem are both aspects of the sociometer. Whereas state self-esteem provides momentary information about how well one is doing as a mate, trait self-esteem may be a more stable representation of one's relational potential over time, being determined by one's past experiences of inclusion and rejection, and by one's presumed standing on and perceived importance of socially desirable traits such as physical attractiveness or social status (Anthony et al., 2007; Leary & Baumeister, 2000; MacDonald, Saltzman, & Leary, 2003). Fluctuations in state self-esteem may occur around individually different, more stable levels of trait self-esteem (Leary, Haupt, et al., 1998), so that the effect of capacity rejection on state self-esteem would be much lower for participants high on trait self-esteem. However, we expected that for capacity rejection in the mating domain, even a high level of trait self-esteem would not buffer the blow to state self-esteem.

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Method

Participants and Design

Ninety students (57 women, 33 men; mean age = 19.98, $SD = 3.45$) from the University of Groningen participated in exchange for partial course credit. Participants were randomly assigned to the *physical attractiveness* condition, the *competence and status* condition, or the control condition. Participants were evenly distributed across the three conditions and completed the study sessions within separate cubicles where all materials were presented on computers in Dutch.

Procedure

The study was described as an investigation of the relationship between different aspects of the self-concept and the so-called ''Mate Value Inventory'' (MVI). Upon arrival in the laboratory, the experimenter took a digital photo of the participant's face, which would allegedly be used to determine their facial symmetry. Then, the experimenter measured the participants' waist-to-hip ratio (for female participants) or shoulder-to-waist ratio (for male participants). After having answered some general questions about their age, gender, and relationship status, participants completed the MVI, which consisted of a measure of trait self-esteem (the Rosenberg Self-Esteem scale; Rosenberg, 1965) and several filler scales (e.g., scales measuring mate value, risk seeking, need for a partner). Upon completion, a small clock appeared on the computer screen and participants in the two experimental conditions were asked to wait until the computer had finished calculating their score on the test, which was allegedly based on the entire set of data that had just been collected. After a few minutes, participants received their score via the computer; they were given feedback indicating that they are likely to be frequently rejected by possible mates and that they are unlikely to end up with a partner later in life. The reason given for the negative feedback differed in the two experimental conditions. Participants in the physical attractiveness condition were informed that their low score was due to their physical characteristics. Participants in the competence and status condition were informed that their low score was due to their lack of competence and status (see Appendix B). Participants in the control condition did not receive negative feedback. They were told that the calculation of the score takes some time and that they would receive their result at the end of the study.

Following the experimental manipulation, participants completed a measure of beliefs about their qualities and a measure of state self-esteem. In this study, the order in which these two measures were presented was randomized.

As in Study 1, we wanted to measure participants' positive beliefs about qualities that were related to the rejected domain. In our first study, we asked them about beliefs that distinguished qualities related to either the domain of mating or friendship. In our second study, we wanted a more detailed measurement of beliefs that are positively related to mate value for both men and women. Participants were asked to evaluate themselves on five qualities: ''Compared to the average peer, how attractive/social/creative/intelligent/competent are you?'' Responses were provided on a 7-point scale (endpoints labeled *1 = not at all, 7 = very*).

Our primary dependent variable was again a measure of state self-esteem. In Study 2, we used an extended version of the measure. In addition to the 12 items that were used in Study 1, 10 items were added (sad, happy, angry, serene, ugly, attractive, desperate, optimistic, disdained, and loved). Because the original scale comprised many competence-related items, we wanted to balance the scale by adding some items that may pertain more directly to self-evaluations regarding one's value as a mate for both men and women.

Finally, participants completed manipulation-check items (same as in Study 1) after which they were thoroughly debriefed.

Results

Manipulation Check

Did the manipulation bring about feelings of experienced rejection? A single index of feelings of rejection was created as in Study 1 ($\alpha = .86$). A 2 (sex) × 3 (condition) ANOVA revealed no main effect of sex, $F(1, 84) = 2.28$, $p = .14$, partial

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$\eta^2 = .03$, and a strong main effect of condition, $F\,(2, 84) = 54.98$, $p < .01$, partial $\eta^2 = .57$; there was no interaction effect, $F\,(2, 84) = .01$, $p = .99$, partial $\eta^2 < .01$. Bonferroni *post hoc* tests revealed that participants in the physical attractiveness ($M = 4.67$) and competence and status ($M = 4.83$) conditions felt more rejected, compared with participants in the control condition ($M = 2.57$, both p'$s < .01$). In other words, men and women in both capacity-rejection conditions felt rejected, irrespective of the specific reason for the rejection.

Effect of Rejection Manipulation on State Self-Esteem

To test the effect of the capacity-rejection manipulation on state self-esteem, we first created a single self-esteem index by reverse-coding the negative feelings so that higher scores indicate higher state-self-esteem, and then averaging across the 22 self-relevant emotions ($\alpha = .91$). A 2 (participant sex) $\times$ 3 (condition) ANOVA revealed no main effects (both p'$s \geq .33$); there was, however, a significant interaction effect, $F(2, 84) = 3.12$, $p = .05$, partial $\eta^2 = .07$ (see Figure 2). The specific nature of the interaction effect is illuminated by the results of two planned contrasts. Among men, state self-esteem was significantly lower in the competence and status condition ($M = 4.94$), compared with the physical attractiveness ($M = 5.36$, $d = .81$) and control ($M = 5.46$, $d = .76$) conditions, $t(31) = 2.07$, $p = .05$. Among women, state self-esteem was significantly lower in the physical attractiveness condition ($M = 4.84$), compared with the competence and status ($M = 5.36$, $d = .66$) and control ($M = 5.27$, $d = .54$) conditions, $t(55) = 2.25$, $p < .05$.

Our expectation that relationship status does not affect the link between capacity-rejection and self-esteem was tested with an ANOVA. There was neither a main effect of relationship status, $F(1, 84) < .01$, $p = .96$, partial $\eta^2 < .01$, nor an interaction effect between the capacity-rejection manipulation and relationship status, $F(2, 84) = .87$, $p = .43$, partial $\eta^2 = .02$.

State self-esteem was substantially correlated with trait self-esteem, $r(90) = .55$, $p < .01$. An ANCOVA including trait self-esteem as a covariate, however, showed that, as we had expected, the interaction effect between sex and condition remained unchanged, $F(2, 84) = 3.21$, $p = .05$, partial $\eta^2 = .07$.

Does the Effect Remain after Controlling for Feelings of Rejection?

Feelings of rejection were correlated with state self-esteem, $r(88) = -.37$, $p < .01$. To test for the possibility that the effect of the manipulation on self-esteem is explained by feelings of rejection, we conducted a 2 (sex) $\times$ 3 (condition) ANCOVA in which the rejection index was entered as a covariate. Neither main effect was significant (both p'$s \geq .12$), and the interaction effect remained significant, $F(2, 83) = 3.55$, $p < .05$, partial $\eta^2 = .08$, indicating that feelings of rejection do not fully explain the effect of the capacity-rejection manipulation on state self-esteem.

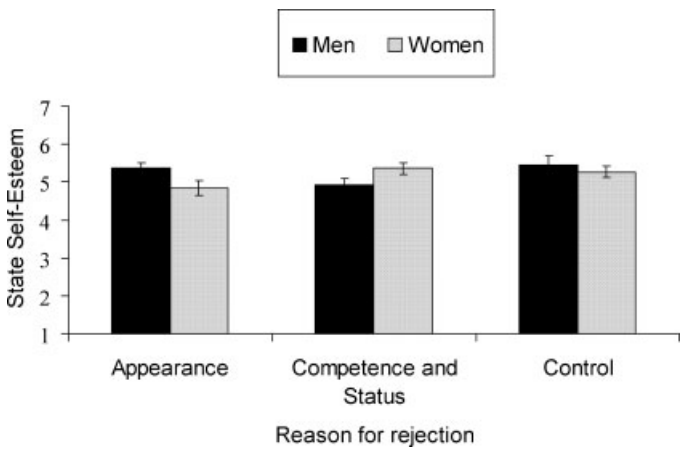

Figure 2. Effect of manipulation (physical attractiveness-based rejection, competence and status-based rejection and control) on state self-esteem in men and women (errors bars indicate $\pm$ *SE*)

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Positive Beliefs about the Self

To test whether the manipulation had any effect on people's beliefs about their qualities, we created a single index of self-beliefs by averaging across the five items ($\alpha = .65$; despite of the low internal consistency of this composite, re-running the same analysis with the single items revealed similar results). The results of an ANOVA revealed no effect of the manipulation on people's beliefs about their qualities, $F(2, 87) = .99$, $p = .38$, partial $\eta^2 = .02$, indicating that, as expected, people maintain positive beliefs about their qualities (the mean was above the scale midpoint of 4; $p < .01$), even while experiencing a drop in self-esteem.

Participants' self-beliefs were significantly correlated with state self-esteem, $r(90) = .22$, $p < .05$, suggesting that positive beliefs may influence the effect of capacity rejection on participants' feelings of self-esteem. An ANCOVA including positive beliefs as a covariate, however, showed that the interaction effect between sex and condition remained significant, $F(2, 83) = 4.07$, $p < .05$, partial $\eta^2 = .09$.

Discussion

The results of Study 2 showed that the impact of capacity rejection based on competence and status or capacity rejection based on physical attractiveness depends on one's sex. Consistent with the idea that characteristics that define high mate value differ somewhat for men and women, men experienced a drop in self-esteem following capacity rejection based on competence and status, whereas women experienced a drop in self-esteem following capacity rejection based on physical attractiveness. As in Study 1, the effect remained when controlling for feelings of rejection and was independent of positive beliefs that people seem to maintain following capacity rejection. The results were consistent with the hypothesis that the sociometer is attuned to the importance of particular trait aspects for the person, so that men and women are sensitive to different reasons for capacity rejection in the mating relationship context.

GENERAL DISCUSSION

If indeed people possess a sociometer that gauges their relational successes and failures, then one reasonable speculation is that the sociometer is especially sensitive to rejection that has functional relevance. The effect of rejection may therefore differ by relationship context and the salience of role, such as roles in mating or friendship contexts. Based on evolutionary reasoning, we argued that the sociometer may be particularly attuned to the mating domain as compared to the friendship domain when the entire domain is threatened. We thus introduced the concept ''capacity rejection'' to manipulate not rejection in a particular relationship, but belief that one is unable to establish relationships of this kind now and even more in the future. We conducted Study 1 to test the hypothesis that the drop in self-esteem may be especially pronounced following capacity rejection within a mating (versus non-mating) relationship context. In Study 2, we tested the hypothesis that the drop in men's and women's self-esteem may be especially pronounced following rejection based on competence/status and physical attractiveness, respectively. Results from the studies were consistent with both hypotheses.

The original version of the sociometer theory by Leary assumes a sociometer that is sensitive to rejection in general. This theory seems to be in need to refinement in two directions. First, there are likely to be functionally specific forms of the sociometer or, alternatively, different sensitivities of a general sociometer to the salience of roles. Second, it seems useful to distinguish a sociometer for existing social relationships and a sociometer for the capacity to establish and maintain relationships, and in our studies we focused on the latter. For reasons of evolutionary primacy, the domain of mating relationships is likely to be so important that a threat to this domain overshadows a threat to other domains, irrespective of role salience or relational context. This sociometer, in turn, seems to be sensitive to aspects that are particularly important for the mating context, which differs for men and women. When men are rejected on physical appearance, their sociometer does not react; conversely, when women are rejected on the basis of status and competence, their sociometer does not react. What follows from this is that the individual characteristic of physical appearance acquires considerable importance for women's self-esteem, and not just when mating relationships are salient. It may even provide clues as to why plastic surgery, once available, has become such a popular remedy for women who are concerned about their physical appearance, even though it is a drastic intervention. Similarly, for men, status and competence (both aspects that easily lead to competitive contexts) acquire special importance for self-esteem even outside of the mating domain

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Another important finding of our studies was that alongside malleable affective reactions (self-esteem) there are likely to be stable positive beliefs that may facilitate approach behavior even in the face of rejection. Specifically, we found that even while self-esteem decreased, positive beliefs about the self were maintained following the capacity-rejection manipulation. Positive beliefs about the self are functional (Haselton & Nettle, 2006; Kurzban & Aktipis, 2006, 2007; Trivers, 2000), and such beliefs may be especially important following capacity rejection to motivate approach behavior. Indeed, there is experimental evidence that rejection increases people's motivation to forge new social bonds (Maner et al., 2007). Because self-esteem is based largely on affective rather than cognitive representations (e.g., Arndt & Goldenberg, 2002), a plausible assumption is that the affective component (self-esteem) functions as a relational monitor, while the cognitive component (self-beliefs) facilitates approach behavior. Although our evidence clearly points in this direction, this remains speculative, and more research is needed to delineate the array of self-relevant reactions that occur following specific kinds of social rejection.

Our theory and findings imply that relationship status should not have much of an impact on the effect of capacity rejection. This finding seems to contradict Penke and Denissen's (2008) finding that relationship status does influence the correlation between self-perceived mate value and self-esteem (at least for men). However, the measures used by Penke and Denissen (namely, past short-term mating success and current relational status) do not clearly map onto mating capacity pertaining to the future. To the degree that their measures did tap mating capacity, the effect is small (as we would expect) and probably shows up as a result of their large sample size.

Indeed, a possible limitation of the present research is the relatively small sample size, especially among men. Thus, although we obtained the predicted results, further research is needed to verify the robustness of these findings.

In this paper we claimed that the mating domain is more important than the domain of close social bonds for reasons of evolutionary primacy. Although the current results are in line with this idea, we cannot rule out the possibility that these findings are culture bound. The importance of one's capacity as a mate may, at least in part, be due to the freedom of mate choice in Western societies, where one's success in finding a suitable partner depends primarily on one's desirability as a mate. In societies where arranged marriage is the rule, rejection from the family and social group may have a greater impact than mate rejection. Of course, one's desirability as a mate in those societies often depends on the prestige of the family or social group that one belongs to; thus, rejection in these relational domains may coincide with mate rejection in Western societies. Consequently, the impact of mate rejection compared with rejection from the family or social group may be smaller in these societies. To examine this possibility, future cross-cultural studies would be needed.

Finally, the prominence of mating when entire domains are threatened could be due to the age of our participants, who were all young adults (18–25 years old). It has been proposed that during this period, people develop their mating intelligence (i.e., how to make feasible mate choices based on their own self-assessments; Penke, Todd, Lenton, & Fasolo, 2008), which may make information regarding relational value as a mate especially salient. We could not directly test the effect of age, because we only had participants of one specific age group. If indeed people are especially sensitive to their relational value as a mate during young adulthood, the present findings may not replicate among substantially younger or older people. Furthermore, other relationships may be especially important at other ages, with the implication that people may be especially sensitive to acceptance/rejection within those relationships at the relevant ages. For instance, acceptance by a parent may be especially critical for children, and acceptance by friends may be especially critical for adolescents; accordingly, children's self-esteem may be especially influenced by parental rejection (see Rohner, 2004), and adolescents' self-esteem may be especially influenced by peer rejection (see Parker & Asher, 1987). Carstensen, Isaacowitz, and Charles (1999) also found that older people concentrate more on affective relationships than young people. However, as research by Steverink & Lindenberg (2006) suggested, it is possible that this relational selectivity is mainly brought about by changes in opportunity rather than by a change in fundamental preferences. Penke & Denissen (2008) also found that the sensitivity of self-esteem to people's mate values is independent of age.

Clearly, there remain many unexplored avenues for research on the sociometer. And many of these avenues are opening up as a result of more sophisticated integration between social psychological theories and evolutionary principles.

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REFERENCES

Anthony, D. B., Holmes, J. G., & Wood, J. V. (2007). Social acceptance and self-esteem: Tuning the sociometer to interpersonal value. *Journal of Personality and Social Psychology*, *92*, 1024–1039.

Arndt, J., & Goldenberg, J. L. (2002). From threat to sweat: The role of physiological arousal in the motivation to maintain self-esteem. In A. Tesser, D. A. Stapel, & J. V. Wood (Eds.), *Self and motivation: Emerging psychological perspectives* (pp. 43–70). Washington, DC: APA.

Baumeister, R. F., Bushman, B. J., & Campbell, W. K. (2000). Self-esteem, narcissism, and aggression: Does violence result from low self-esteem or from threatened egotism? *Current Directions in Psychological Science*, *9*, 26–29.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497–529.

Ben Hamida, S., Mineka, S., & Bailey, J. M. (1998). Sex differences in perceived controllability of mate value: An evolutionary perspective. *Journal of Personality and Social Psychology*, *75*, 953–966.

Brase, G. L., & Guy, E. C. (2004). The demographics of mate value and self-esteem. *Personality and Individual Differences*, *36*, 471–484.

Buss, D. M. (2003). *The evolution of desire: Strategies of human mating*. New York: Basic Books.

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, *100*, 204–232.

Crocker, J., & Knight, K. M. (2005). Contingencies of self-worth. *Current Directions in Psychological Science*, *14*, 200–203.

Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist 54*, 165–181.

Denissen, J. J. A., Penke, L., Schmitt, D. P., & van Aken, M. A. G. (2008). Self-esteem reactions to social interactions: Evidence for sociometer mechanisms across days, people, and nations. *Journal of Personality and Social Psychology*, *95*, 181–196.

Eastwick, P. W., & Finkel, E. J. (2008). Sex differences in mate preferences revisited: Do people know what they initially desire in a romantic partner? *Journal of Personality and Social Psychology*, *94*, 245–264.

Frijda, N. H. (1986). *The emotions*. Cambridge: Cambridge University Press.

Haselton, M. G., & Nettle, D. (2006). The paranoid optimist: An integrative evolutionary model of cognitive biases. *Personality and Social Psychology Review*, *10*, 47–66.

Kirkpatrick, L. A., & Ellis, B. J. (2001). An evolutionary-psychological approach to self-esteem: Multiple domains and multiple functions. In G. Fletcher, & M. Clark (Eds.), *The Blackwell handbook of social psychology (Vol. 2): Interpersonal processes* (pp. 411–436). Oxford: Blackwell.

Kirkpatrick, L. A., Waugh, C. E., Valencia, A., & Webster, G. D. (2002). The functional domain specificity of self-esteem and the differential prediction of aggression. *Journal of Personality and Social Psychology*, *82*, 756–767.

Kurzban, R., & Aktipis, C. A. (2006). Modular minds, multiple motives. In M. Schaller, J. A. Simpson, & D. T. Kenrick (Eds.), *Evolution and social psychology* (pp. 39–53). New York: Psychology Press.

Kurzban, R., & Aktipis, C. A. (2007). Modularity and the social mind: Are psychologists too self-ish? *Personality and Social Psychology Review*, *11*, 131–149.

Leary, M. R. (2005). Sociometer theory and the pursuit of relational value: Getting to the root of self-esteem. *European Review of Social Psychology*, *16*, 75–111.

Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 32, pp. 1–62). San Diego, CA: Academic Press.

Leary, M. R., Haupt, A. L., Strausser, K. S., & Chokel, J. T. (1998). Calibrating the sociometer: The relationship between interpersonal appraisals and state self-esteem. *Journal of Personality and Social Psychology*, *74*, 1290–1299.

Leary, M. R., Springer, C., Negel, L., Ansell, E., & Evans, K. (1998). The causes, phenomenology, and consequences of hurt feelings. *Journal of Personality and Social Psychology*, *74*, 1225–1237.

Leary, M. R., Tambor, E. S., Terdal, S. K., & Downs, D. L. (1995). Self-esteem as an interpersonal monitor: The sociometer hypothesis. *Journal of Personality and Social Psychology*, *68*, 518–530.

Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. W. (2002). The necessities and luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology*, *82*, 947–955.

MacDonald, G., Saltzman, J. L., & Leary, M. R. (2003). Social approval and trait self-esteem. *Journal of Research in Personality*, *37*, 23–40.

Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does social exclusion motivate interpersonal reconnection? Resolving the ''porcupine problem''. *Journal of Personality and Social Psychology*, *92*, 42–55.

McFarland, C., & Ross, M. (1982). Impact of causal attributions on affective reactions to success and failure. *Journal of Personality and Social Psychology*, *43*, 937–946.

Murray, S. L., Griffin, D. W., Rose, P., & Bellavia, G. M. (2003). Calibrating the sociometer: The relational contingencies of self-esteem. *Journal of Personality and Social Psychology*, *85*, 63–84.

Penke, L., & Denissen, J. J. A. (2008). Sex differences and lifestyle-dependent shifts in the attunement of self-esteem to self-perceived mate value: Hints to an adaptive mechanism? *Journal of Research in Personality*, *42*, 1123–1129.

DOI: 10.1002/ejsp

Penke, L., Todd, P. M., Lenton, A., & Fasolo, B. (2008). How self-assessments can guide human mating decisions. In G. Geher, & G. F. Miller (Eds.), *Mating intelligence: Sex, relationships, and the mind's reproductive system* (pp. 37–75). Mahwah, NJ: Lawrence Erlbaum.

Parker, J. G., & Asher, S. R. (1987). Peer relations and later personal adjustment: Are low-accepted children at risk? *Psychological Bulletin*, *102*, 357–389.

Rohner, R. P. (2004). The parental ''acceptance–rejection syndrome'': Universal correlates of perceived rejection. *American Psychologist*, *59*, 830–840.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton: Princeton University Press.

Steverink, N., & Lindenberg, S. (2006). Which social needs are important for subjective well-being? What happens to them with aging? *Psychology and Aging*, *21*, 281–290.

Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, *103*, 193–210.

Trivers, R. (2000). The elements of a scientific theory of self-deception. *Annals of the New York Academy of Sciences*, *907*, 114–131.

Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If you can't join them, beat them: Effects of social exclusion on aggressive behavior. *Journal of Personality and Social Psychology*, *81*, 1058–1069.

Williams, K. D., Cheung, C. K. T., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the Internet. *Journal of Personality and Social Psychology*, *79*, 748–762.

APPENDIX A

''You got two scores on the SFMVI, one for your social qualities and one for your qualities as a mate.

Mate Rejection

For your *social qualities* you received an *average score*.

People who fall within this category can achieve an average level of social functioning if they want to. This means there is an average probability that you will have many good social contacts and friendships in your life.

For your *qualities as a mate* you received a *very low score*.

People who fall within this category are hardly able to establish and maintain romantic relationships. This means that there is a low probability that you will have good and fulfilling relationships and a high probability of frequent rejection by possible mates. Even if you are in a relationship now, this will change, and the older you get the more likely it becomes that you will end up without a partner later in life.''

Friend Rejection

For your *qualities as a mate* you received an *average score*.

People who fall within this category can achieve an average level of mating success if they want to. This means there is an average probability that you will have many good romantic relationships in your life.

For your *social qualities* you received a *very low score*.

People who fall within this category are hardly able to establish and maintain social contacts and friendships. This means that there is a low probability that you will have good and fulfilling friendships and a high probability of frequent rejection by possible friends. Even if you are having many friends now, this will change, and the older you get the more likely it becomes that you will end up without any friends later in life.''

APPENDIX B

''The MVI is based on different aspects that play a role in finding and keeping a mate. Together these aspects form your personal mate value, which is your desirability as a romantic partner. Earlier research has shown that the MVI is a reliable tool to predict future success in romantic relationships based on mate value.

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From the different dimensions of the MVI, we calculated an aggregate score that comprises your personal profile. This led to the following result:

Physical Attractiveness Rejection

You received a very low score on your physical measurements (the symmetry of your face, hip/shoulder to waist ratio). Physical appearance is very important for establishing and keeping a romantic relationship.

You received an average score on competence and status. Those aspects also contribute to your mate value.

Taken together, this means that you have a low mate value. Therefore your relationships will probably be of short duration. You will be frequently rejected which will make it difficult for you to find someone with whom you can maintain a stable relationship. The older you get, the more likely it becomes that you will end up without a partner in life.''

Status and Competence Rejection

You received a very low score on competence and status. Those aspects are very important for establishing and keeping a romantic relationship.

You received an average score on your physical measurements (the symmetry of your face, hip/shoulder to waist ratio). Physical appearance also contributes to your mate value.

Taken together, this means that you have a low mate value. Therefore your relationships will probably be of short duration. You will be frequently rejected which will make it difficult for you to find someone with whom you can maintain a stable relationship. The older you get, the more likely it becomes that you will end up without a partner in life.''

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