

Original Article

Social Inclusion Facilitates Interest in Mating

Christina M. Brown, Psychology, Miami University, Oxford, OH, USA. E-mail: browncm5@muohio.edu
(Corresponding author)

Steven G. Young, Psychology, Miami University, Oxford, OH, USA.

Donald F. Sacco, Psychology, Miami University, Oxford, OH, USA.

Michael J. Bernstein, Psychology, Miami University, Oxford, OH, USA.

Heather M. Claypool, Psychology, Miami University, Oxford, OH, USA.

Abstract: According to a life history framework, variability across an organism's lifespan necessitates trade-offs between behaviors that promote survival and those that promote reproduction. Adopting this perspective, the current work investigates how social acceptance or rejection can influence the differential priority placed on mating and survival motivations. Because social acceptance is an important survival-related cue (i.e., group living provides protection from predators and sharing of resources), we predicted that recent experiences of social acceptance should increase people's motivation to mate. In support of this prediction, Study 1 found that participants who were included in an electronic ball-toss game showed more interest in mating (regardless of the potential mate's attractiveness) than excluded and control participants. In Study 2, participants who recalled an experience of social acceptance viewed sexual affiliation as more important than did participants in rejection and control conditions. Collectively, these results suggest an adaptive trade-off such that interest in mating increases upon satiation of affiliative needs. Furthermore, these findings demonstrate that the experience of social acceptance can have unique effects and should not be treated as the sole comparison condition when studying social rejection.

Keywords: social acceptance, mating, inclusion, rejection, goal pursuit.

Introduction

Although human behavior is undeniably complex, many of our activities are selected based on their effectiveness in solving fundamental problems related to survival

and reproduction. Specifically, an organism's ultimate success is determined by its ability to survive long enough to reproduce and to ensure that those offspring reach reproductive age themselves. However, the current research hinges on the implicit assumption that some of these goals require more immediate solutions than others, leading individuals to prioritize these goals around the differential value associated with their attainment (e.g., Kaplan and Gangestad, 2005; Kenrick et al., 2002). For example, an individual threatened by a predator or by hunger is likely to place greater immediate value on behaviors that facilitate survival, rather than focusing on the identification and pursuit of potential mates. Building on this logic of goal prioritization, we argue that the experience of social inclusion, or the experience of stable group membership, acts as a proximal indication that survival-based needs have been met, and as such, individuals can "reprioritize" their resources and interests toward mating-related activities.

Human beings are fundamentally social creatures. Specifically defined as ultrasocial, humans are one of only a few species whose social organizational structure consists of (1) a full time division of labor, (2) information sharing regarding food and potential dangers, and (3) collective defense mechanisms that include self-sacrificial behaviors (Campbell, 1983). The inherent value of group living in humans, considered essential for survival and reproduction in our evolutionary past (Brewer, 2004; Kenrick, Maner, and Li, 2005), is also apparent in contemporary human societies. According to the *belongingness hypothesis* (Baumeister and Leary, 1995), forming and maintaining close relationships with others is a fundamental motivation, common to all humans, analogous to satiating hunger and slaking thirst. This "need to belong" is believed to be the product of natural selection; maintaining social bonds benefits both survival and reproduction, resulting in the universal human motivation for social belongingness.

Some of the most convincing evidence for the value of social inclusion comes from research documenting the variety of negative consequences that occur when this need has been thwarted. For instance, the long-term loss of social bonds threatens mental and physical health, leading to outcomes such as loneliness, depression, and decreased immune system functioning (Cacioppo, Hawkley, and Bernston, 2003). Beyond the study of long-term isolation, the past decade has seen a proliferation of research on the consequences of immediate social rejection -- the experience of being ignored or excluded by others in a social situation¹ (Williams, 2007). Social rejection is believed to evoke a number of stable responses precisely because it threatens this basic need.

To date, the literature has revealed a number of reliable consequences of social rejection, many of which are often viewed as harmful, including increased aggression (Leary, Twenge, and Quinlivan, 2006), impaired self-regulation (Baumeister, DeWall, Ciarocco, and Twenge, 2005), and reduced intelligent thought (Baumeister, Twenge, and Nuss, 2002). However, additional research has revealed other, more beneficial responses believed to facilitate reconnection and affiliation with others (Maner, DeWall, Baumeister, and Schaller, 2007; Pickett and Gardner, 2005). For example, these positive consequences of rejection include improved recognition of facial expressions (Pickett, Gardner, and Knowles, 2004), greater accuracy at discriminating between genuine and fake smiles (Bernstein, Young, Brown, Sacco, and Claypool, 2008), enhanced behavioral mimicry (Lakin, Chartrand, and Arkin, 2008), and superior memory for socially relevant information (Gardner, Pickett, and Brewer, 2000). This responsiveness to potential signs of affiliation illustrates how sensitive humans are to social inclusion threats and how disparate

elements of cognition and perception are recruited in an attempt to secure social reaffiliation. In other words, these stable responses to social rejection are all believed to originate from humans' pervasive need for social belongingness.

Given the centrality of group living for successful survival and reproduction in humans' evolutionary history (e.g., Kenrick et al., 2002; Kenrick et al. 2005), research has focused almost exclusively on the effects of frustrating that need to belong via short and long-term social rejection (see Williams, 2007, for a review). However, might a recent experience of acceptance and inclusion also elicit its own unique reactions? That is, might the attainment of one high priority survival goal, such as inclusion in a social group, lead to a "shift" in goal-directed behavior and interest toward other high priority goals not currently met, such as reproduction? The current work explores just this question.

The reprioritization hypothesis

Although affiliating with others is a fundamental drive (Baumeister and Leary, 1995), one's sense of acceptance or inclusion is not a constant state. For instance, Leary, Tambor, Terdal, and Downs (1995) have proposed that self-esteem evolved as a "sociometer," which gauges an individual's level of social belonging. Importantly, the sociometer is responsive to potential cues of both rejection *and* acceptance. It lowers self-esteem when belongingness is at risk and raises self-esteem when belongingness is increased, suggesting that both social rejection and acceptance affect an individual (i.e., acceptance is not the baseline). Thus, just as losing social relationships evokes a host of unique consequences, forging new relationships with others may affect people in a variety of novel ways as well.

In addition, current theories in social-evolutionary psychology lend support to the position that social acceptance may have meaningful consequences for human behavior. As discussed briefly above, social connections are beneficial for pursuing goal-oriented outcomes such as mating. For instance, Kenrick and colleagues (2002) argue that without the resources and security provided by social groups, survival is threatened by a lack of stable access to food, shelter, and protection from both human and animal predation. Additionally, access to mates is limited without membership in a social group. Thus, an individual who has been socially rejected should find him or herself pursuing basic reconnection above other interpersonal pursuits (such as mating), an adaptive response given the importance of social affiliation for basic survival.

Likewise, an individual who has been socially accepted should experience a similar restructuring of priorities and motivations. With basic survival needs met, individuals can redirect their energies toward a second evolutionarily basic motivation, that of pursuing reproductive opportunities. This is facilitated by the fact that group living not only provides resources for survival, but also provides access to a stable pool of potential mating partners (Schaller, Park, and Kenrick, 2007). Therefore, individuals whose survival needs have been satisfied and who now have access to potential mating partners should focus their efforts on pursuing relationships with those potential partners. From this framework, we propose that experiences of social acceptance lead to a reprioritization of basic motivations related to survival and reproduction.

Our conceptualization of goal reprioritization in the context of experiences of social inclusion and exclusion is consistent with more general evolutionary theories, specifically Life History Theory (LHT; Kaplan and Gangestad, 2005). LHT is derived from

evolutionary biology and ecology, and has recently been applied to human psychology as well. According to LHT, allocation of resources (e.g., attention, time, energy) to the procurement of gains or avoidance of losses requires trade-offs between these competing tasks. One of the most researched topics incorporating LHT is mating strategies and reproductive tendencies (e.g., Kaplan and Gangestad, 2005; Kruger and Fisher, 2008; MacDonald, 1997). For example, a common evolutionary trade-off in human reproductive strategies concerns the timing of reproduction (Gangestad and Simpson, 2000). For instance, an individual can devote resources to mating now, at the expense of acquiring resources like food and status. Contrariwise, an individual can forestall mating efforts for the sake of devoting resources to other adaptive problems, such as immediate survival or seeking acceptance from a social group. Our own prediction is consistent with a life history perspective: social inclusion should reflect an opportunity to devote one's energies to mating, given that other basic resources have been secured. In other words, when considering the trade-off between survival resources and mating, an individual who has already secured resources through group living should be in an ideal position to pursue mating.

The current research

We hypothesize that individuals who have recently experienced social acceptance should be more interested in mating opportunities than individuals who have been socially rejected or who have not recently experienced any change in social status. The goal of mating should, in other words, be of highest priority to individuals who have been socially accepted. Social inclusion can be considered a proximal indicator of the attainment of basic survival needs, meaning that for socially accepted individuals survival-based goals do not immediately outweigh reproductive motives. As such, the reprioritization hypothesis predicts that these individuals should show the greatest interest in mating. This prediction was tested in two studies. We examined the effect of inclusion status on interest in mating (Study 1) and on self-reported importance of mating (Study 2).

Study 1

Overview

Inclusion status was manipulated by having participants play a game of Cyberball (Zadro, Williams, and Richardson, 2004). Some participants were either included or excluded from the game of Cyberball, while a control group of participants did not play the game but completed all other portions of the experiment. Following this manipulation, participants were shown faces of the opposite sex (varying in attractiveness) and were asked questions regarding their romantic interest in them. Notably, research on social rejection has often used social acceptance as the sole comparison group, but we believe that such comparisons are inappropriate if social acceptance produces unique consequences. For these reasons, in both studies we included a control group of participants who had not recently been accepted or rejected to determine if recent experiences of social acceptance increase mating interest relative to individuals experiencing no change in inclusion status as well as individuals recently experiencing social rejection.

Materials and Methods

Participants

Participants were 83 students from Miami University who received partial course credit for their participation. Six participants encountered a computer error that terminated the program half-way through the experiment. These participants were excluded from all analyses, resulting in a total of 77 participants (32 males, 45 females).

Materials

Faces. Nine female faces and nine male faces (three highly attractive, three moderately attractive, and three unattractive faces of each sex) were used as stimuli in this experiment. These 18 faces were selected from a larger pool of faces that were rated for attractiveness during a pre-test ($N = 65$).² The highly attractive faces were those that received the highest average rating of attractiveness (on a scale of 1 = *very unattractive* to 10 = *very attractive*), the moderately attractive faces were those that received average ratings around the mid-point of the scale (5), and the unattractive faces were those that received the lowest average ratings.

Measures

Cyberball manipulation check. Participants in the acceptance and rejection conditions completed a brief manipulation check about the Cyberball game. First, they were asked to report how they felt during the game by indicating their agreement to the statements, “I was ignored” and “I was excluded,” on a 1 (*agree*) to 5 (*disagree*) scale. Second, participants were asked to type the percentage of throws they received during the game (they were given the example that 33% would mean they received the ball a third of the time).

Mating interest. Nine faces of the opposite sex were shown to participants to be rated on a number of dimensions relevant to mating. Faces were presented to participants one at a time and each face was accompanied by a set of questions that assessed participants’ romantic (mating) interest in the target. Specifically, participants were asked to indicate their answers to the following questions on a 10-point Likert scale (1 = *not at all*; 10 = *very much*): “How likely would you be to approach this person for a date,” “Would you be interested in having a relationship with this person,” and “How aroused are you by this person?” These questions were embedded in a list of filler questions irrelevant to the hypothesis.

Procedure

Participants completed the tasks, which were administered using a computer, in private cubicles. The experiment was described as a study of mental visualization. To strengthen the cover story, all participants first completed a brief 12-item filler questionnaire with items related to mental visualization (e.g., “I am a visual person,” “I have difficulty understanding instructions without first seeing a demonstration”; Zadro et al., 2004). For participants in the control condition, this was the only mental visualization task they completed. For participants in the acceptance and rejection conditions, they then participated in a game of Cyberball (Zadro et al., 2004), which was also described as a mental visualization task. Specifically, participants were told that the task assessed the

effect of practicing mental visualization on performance, and they were instructed to mentally visualize the entire Cyberball experience (e.g., they were told to imagine what the other players look like, what sort of people they are, where they are playing the game, etc.). Participants then began Cyberball, an interactive ball-toss game. Participants viewed two cartoon-like characters and a hand, with the two characters marked as “Player 1” and “Player 2” and the hand marked as “Me.” Participants were told that when the ball was tossed to them, they could click on another player to toss the ball to that player. Participants in the rejection condition received the ball twice at the beginning of the game and were ignored for the remainder of the game. In contrast, participants in the acceptance condition received the ball a third of the time. The total duration of the game was approximately 2 minutes.

Next, participants in the acceptance and rejection conditions completed the Cyberball manipulation check. All participants were then told that they would be answering a series of questions about several different people. Participants were told that we were interested in pre-testing a number of faces along several dimensions to be used in another, unrelated study. Participants were reminded that their responses were anonymous before completing the face evaluation task. After completing this task, participants were thanked for their participation and debriefed.

Results

Manipulation checks

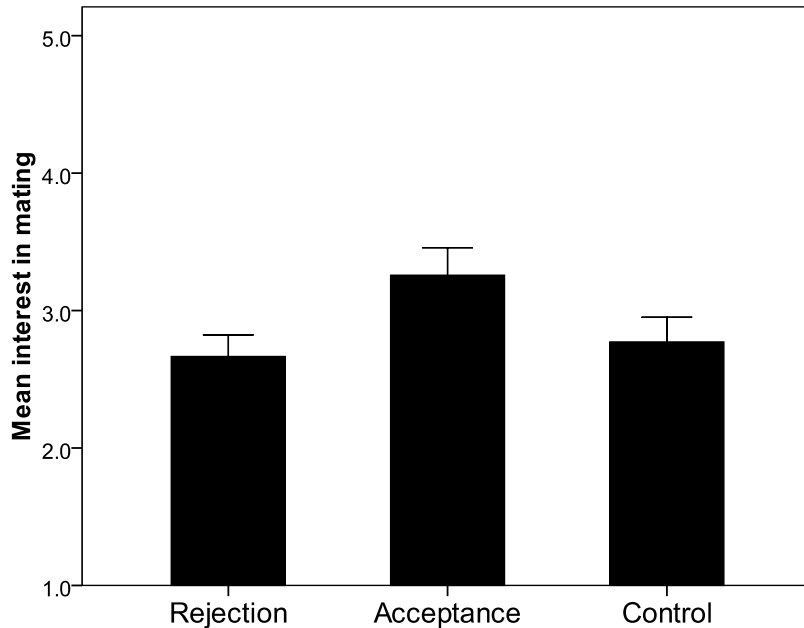
When comparing accepted and rejected participants’ perceptions of the Cyberball game, rejected participants reported significantly more agreement with the statements, “I was ignored,” $F(1,50) = 46.98, p < .001$ (rejected $M = 1.62, SD = 1.08$; accepted $M = 3.74, SD = 1.14$), and “I was excluded,” $F(1,50) = 52.42, p < .001$ (rejected $M = 1.66, SD = 1.14$; accepted $M = 3.91, SD = 1.08$). Rejected participants also reported receiving a smaller percentage of throws ($M = 9.34, SD = 8.44$) during the Cyberball game than did accepted participants ($M = 36.57, SD = 15.85$), $F(1,50) = 63.17, p < .001$.

Interest in mating

Responses to the three mating interest items (collapsed across levels of attractiveness), “how likely would you be to approach this person for a date,” “would you be interested in having a relationship with this person,” and “how aroused are you by this person,” were reliably related ($\alpha = .90$). Participants’ mean responses to these three items formed a measure of their interest in mating.

The main factor of interest in the current study was the effect of condition on mating interest. As expected, a one-way ANOVA revealed that condition significantly affected mating interest, $F(2,74) = 3.04, p = .05$. Consistent with our predictions, LSD post hoc analyses revealed that accepted participants ($M = 3.26, SD = .96$) were significantly more interested in mating than rejected participants ($M = 2.67, SD = .85, p < .03$) and marginally more interested in mating than control participants ($M = 2.77, SD = .90, p = .06$; see Figure 1). Rejected and control participants did not significantly differ, $p > .6$. Importantly, neither attractiveness level ($p = .29$) nor participant sex ($p = .80$) interacted with condition.³

Figure 1. Interest in mating by social inclusion condition. Error bars indicate one SE from mean.



Discussion

As predicted, participants who had recently been socially accepted reported more interest in mating than did either control participants or individuals who had been socially rejected. This is consistent with the proposal that changes in inclusion status lead to a reprioritization of basic motives related to survival and reproduction. As evidenced by the results of Study 1, social acceptance increased interest in mating. When the basic need to affiliate with others and form social relationships was satisfied—thus ensuring access to group resources—individuals appeared to increase their interest in mating. Mating is a fundamental human motive, but one that is best pursued when more basic survival needs are met (Kenrick et al., 2002). Given the importance of social relationships to survival in the history of human evolution, forming social relationships is an indirect method of ensuring survival for both oneself and one’s offspring (Brewer, 2004).

One limitation of the current study is that participants reported their current interest in potential mates. However, interest is an indirect measure of a person’s current motivation to mate. Therefore, in Study 2 we manipulated participants’ inclusion status to observe its effect on self-reported importance of mating. However, if social inclusion does increase the importance of mating, a possible alternative explanation would be that the positive social feelings produced by inclusion lead to a general desire for all forms of social affiliation. To test this alternative explanation, we also assessed the importance of non-sexual affiliation. The reprioritization hypothesis predicts that social acceptance will increase the perceived importance of sexual affiliation only.

Study 2

Overview

Study 2 was conducted to more directly test our hypothesis that social acceptance increases the importance (priority) of mating. Instead of asking participants questions that indirectly assessed their interest in mating, participants were directly asked how important mating-related behavior currently was to them. According to the reprioritization hypothesis, temporary increases in social acceptance should increase the importance of mating relative to social rejection or no manipulation of inclusion (control condition). To test the specificity of our reprioritization hypothesis, we also asked participants about the importance of behaviors that reflected non-sexual affiliation (i.e., friendship) to determine if social acceptance only affects mating importance, as per our reprioritization hypothesis, or if it leads to a general increase in the importance of all forms of social affiliation. Finally, in Study 2 we used a different manipulation of acceptance and rejection to extend our findings.

Materials and Methods

Participants

Participants were 50 Miami University students (24 female, 26 male), all of whom reported that they were not currently in a relationship. They received partial course credit in return for their participation. Unlike Study 1, we were only interested in the effect of acceptance on single (unattached) individuals. Study 2 explored people's desire to initiate new mating relationships, a behavior that should be less relevant to people who are already in a relationship. Relationship status and goals can affect behavior even at a nonconscious level; for example, individuals who are in a relationship show less automatic behavioral mimicry of attractive opposite-sex individuals (Karremans and Verwijmeren, 2008). Because behavioral mimicry occurs automatically and without conscious awareness, these findings suggest that relationship goals (i.e., to attract the opposite sex if unattached; to avoid behaviors that could threaten one's current relationship) influence even nonconscious behavior. For this reason, only single individuals (who are available to pursue new mating opportunities) were selected.

Measures

Importance of mating vs. non-sexual affiliation. To assess participants' perceived importance of mating, they were asked to respond to the question, "At this very moment, how important is going on dates to you?" by indicating their response on a 7-point Likert scale (1 = *not at all important*; 7 = *very important*). Perceived importance of non-sexual affiliation was assessed by asking participants to indicate their response (on the same 1-7 scale) to the question, "At this very moment, how important is making new friends to you?" The terms "dating" and "making new friends" were used to represent mating and non-sexual affiliation, respectively, because these behaviors describe both types of affiliation in a manner that is familiar to our participants (college students). Moreover, both activities reflect the initiation of a new relationship; "making new friends" represents the initiation of non-sexual affiliative relationships, whereas "going on dates" represents the initiation of potential sexual relationships.

Procedure

Participants completed the experiment in private rooms. To manipulate social status, participants were instructed to write an essay about an autobiographical experience. Specifically, they were told to write about a time they felt “rejected or excluded” (rejection condition), a time they felt “accepted or included” (acceptance condition), or “waking up yesterday morning” (control condition). Participants were instructed to vividly remember the experience and to recall how they felt. This manipulation has successfully induced feelings of rejection and acceptance in previous studies (Bernstein, et al., 2008; Gardner et al., 2000). Immediately following the essay task, participants completed the questions assessing importance of mating and non-sexual affiliation. Finally, participants indicated whether they were currently in a relationship. These questions of primary interest were embedded within irrelevant filler questions.

Results

Importance of mating and non-sexual affiliation

We predicted that participants, all of whom were not in a relationship, would rate dating as more important following social acceptance. A 3 (condition: rejected, accepted, control) × 2 (affiliation type: sexual, non-sexual) mixed ANOVA with repeated measures on the second factor revealed a significant main effect of affiliation type, $F(1,47) = 48.62, p < .001$, such that non-sexual affiliation ($M = 5.90, SD = 1.28$) was viewed as more important than sexual affiliation ($M = 4.32, SD = 1.48$). However, this was qualified by a significant interaction with condition, $F(2,47) = 5.59, p < .01$. This interaction was explored by separate one-way ANOVAs of the effect of condition on dating and on friendship. Consistent with our prediction, there was a significant effect of condition on the perceived importance of dating, $F(2,47) = 4.87, p < .05$; planned comparisons revealed that dating was viewed as significantly more important among accepted participants ($M = 5.20, SD = 1.21$) than rejected ($M = 4.19, SD = 1.47, t(47) = 2.05, p < .05$) and control ($M = 3.74, SD = 1.41, t(47) = 3.09, p < .01$) participants. Importance of dating did not differ between rejected and control participants, $t < 1, p > .3$. Additionally, although rejected participants ($M = 6.25, SD = 1.06$) tended to view friendship as more important than accepted ($M = 5.67, SD = 1.45, t(47) = 1.26, p = .2$) and control ($M = 5.79, SD = 1.32, t(47) = 1.06, p = .3$) participants, self-reported importance of friendship did not significantly differ between conditions. (all $ps > .2$).⁴

Table 1. Mean importance of sexual and non-sexual affiliation by condition

	Rejection	Acceptance	Control
Dating (sexual)	4.19 (1.47)	5.20 (1.21)	3.74 (1.41)
Making new friends (non-sexual)	6.25 (1.06)	5.67 (1.45)	5.79 (1.32)

Note. Numbers in parentheses are standard deviations.

Discussion

Consistent with our reprioritization hypothesis, participants who were not romantically attached (i.e., not currently in a relationship) felt that initiating new mating opportunities was more important following an increase in social acceptance compared to social rejection or control. Although acceptance and rejection were not directly manipulated, the current findings indicate that merely increasing the accessibility of past experiences of social acceptance increases the priority of mating.

General Discussion

The current experiments find evidence for novel effects of inclusion status on human mating interest and importance. Study 1 revealed that participants were more interested in activities related to the facilitation and pursuit of reproductive opportunities after they had recently experienced social acceptance, compared to both a control group and participants who recently experienced social exclusion. Study 2 demonstrated that reliving past experiences of social inclusion had a similar effect on perceived mating importance, as participants who wrote about a time they felt socially accepted felt that initiating romantic relationships was more important relative to both control and rejection condition participants. These results support the *reprioritization hypothesis* put forward in this paper, which proposes that following social acceptance—a proximal cue that indicates group-based survival needs have been satisfied—individuals shift their motives toward activities and interests meant to facilitate successful mating and reproduction.

An obvious alternative explanation for accepted participants' increased interest in mating is that positive social feelings are more accessible among these people, consequently increasing their desire to engage in positive relationships with others. However, if this were true, then accepted participants should have also rated making new friends as more important than rejected and control participants, which was not the case. Thus, the effect is specific to mating and cannot be easily explained by accessibility alone.

The reprioritization hypothesis and broader theories

Our reprioritization hypothesis rests on the assumption that social acceptance is an environmental cue indicating that a person's basic safety and coalitional needs have been met. This stable membership status provides increased access to potential mates (Kenrick et al., 2002), thus affording accepted individuals increased mating opportunities. The assumption that social inclusion facilitates survival and reproduction is derived from existing theories within social and evolutionary psychology. For instance, Baumeister and Leary (1995) explicitly state that belonging to social groups is a fundamental human drive, with social support and affiliation being essential to human survival. This sentiment has been echoed by several other researchers investigating the importance of human interpersonal affiliation (e.g., Gardener and Pickett, 2005; Leary et al., 1995; Williams, 2005, 2007).

In addition to Baumeister and Leary's (1995) theorizing, the reprioritization hypothesis is consistent with fundamental evolutionary theories as well. As an example, it has been stated that human sociality itself presented recurrent selective pressures (Barton and Dunbar, 1997), which can be organized around several dimensions, including personal

safety, coalition formation, and reproduction (see Kenrick et al., 2002). An important element of this perspective is that pursuing reproductive opportunities is best done only after securing safety and coalitional needs. Indeed, a great deal of research has made clear the significance of social and familial support not only in providing vital safety needs for a particular individual (as per Baumeister and Leary, 1995), but also in providing needed support for offspring (e.g., Salmon and Shackelford, 2007). Thus, the present finding that recent experiences of social acceptance (Study 1) or recollecting episodes of acceptance (Study 2) increase interest in mating falls nicely in line with the above reasoning.

Finally, the current research can also be seen as consistent with evolutionary life history perspectives (Kaplan and Gangestad, 2005). To review, LHT has at its core the idea of adaptive trade-offs, such as surrendering current mating opportunities for the sake of securing other resources (e.g., safety, coalition) as opposed to devoting resources to pursuing mating opportunities now (e.g., Kenrick, et al., 2002). The reprioritization hypothesis, put forth in the current paper, specifies that one important component of the particular trade-offs individuals pursue is predicated upon their current social standing. Specifically, the present results indicate that social acceptance appears to motivate an interest in mating, thus indicating a shift in priorities relative to both those who experience social rejection and those experiencing a neutral event.

Importantly, the present data did not show a significant decrease in mating interest or importance among rejected individuals. We feel there are several likely reasons for this. First, the reprioritization hypothesis proposes that a sense of safety and security, which inclusion provides, allows individuals to focus their resources on mating. In other words, we believe that a certain threshold must be met before resources can be redirected from the pursuit of affiliation goals to the pursuit of mates. Thus, while social inclusion should increase mating interest above baseline, this does not necessarily mean that social exclusion will reduce interest relative to baseline. Given that mating is still a beneficial form of social affiliation, rejected individuals should not uniformly avoid this avenue for affiliation; some may devalue mating to pursue friendship, while others may increasingly desire mating because it also provides social affiliation. Alternatively, it may be that rejected individuals do attend less to potential mating opportunities relative to baseline, but the specific measures we employed may not have captured the aspects of mating behavior in which rejected individuals do differ.

Speaking more broadly, this pattern of data also sits well with research demonstrating the effect of another aspect of social standing—social status and rank—on mating behavior in both human and non-human animal species (see Fernald, 2006, for a review). For instance, research indicates that in most animal populations, social status and rank are positively related to reproductive success (Ellis, 1995). Within human populations, in relatively simple economies, people tend to equate status with reproductive potential and thus spend vast amounts of time and energy signaling that potential by displaying skills associated with providing food (e.g., Gintis, Smith, and Bowles, 2001; Hayden, 1996). In more industrial economies, people equate status with earning potential and thus individuals signal such potential through public displays of wealth. As an example of the effectiveness of such status cues on reproductive success, Hopcroft (2006) found that in the United States, male income level, a proximal indicator of high status and resource availability, predicts greater reproductive success, as measured by number of biological offspring. Together, such examples provide a clear indication of the vital role social status plays in

reproduction. Although high social status (e.g., rank, wealth) and social inclusion are very different, social inclusion is a necessary prerequisite for social status and the effects on mating may be driven by the same factor: satisfaction of survival needs. To demonstrate, simple inclusion facilitates interest in mating because it represents access to survival resources; high social status represents even greater access to such resources, and thus it affects mating behavior to an even greater extent.

Implications for research on social rejection and inclusion

One interesting aspect of the current work is that our effects were observed after participants experienced or relived past experiences of social acceptance. This marks a novel contribution to the rapidly expanding literature on social rejection, ostracism, and exclusion, which typically focuses on the effects of frustrating belongingness needs while simultaneously treating acceptance as a baseline control condition (e.g., Gardner et al., 2000; Gonsalkorale and Williams, 2007; Warburton, Williams, and Cairns, 2006; Williams, Cheung, and Choi, 2000; van Beest and Williams, 2006). The present results, however, indicate that under some circumstances, social acceptance has unique effects on social behavior, whereas rejection and control experiences do not appear to differ. Moreover, just as rejection leads to the adaptive response of increased sensitivity to affiliation cues (Bernstein et al., 2008; Gardner et al., 2000; Maner et al., 2007; Pickett et al., 2004), the effects of social acceptance on mating are also seemingly adaptive.

Given that our effects are driven by socially accepted participants, rejected participants' concern with general reaffiliation (e.g., Bernstein et al., 2008; Lakin et al., 2008; Maner et al., 2007) may diverge less from baseline than does the precedence given to mating by accepted participants. To explain, in both experiments reported here, rejection and control participants did not differ in terms of their interest in mating. It may be that, at baseline, humans are more concerned with securing and maintaining social bonds than they are with mating. Indeed, the reduced interest in mating exhibited by both control and rejected participants (relative to accepted participants), while arguably surprising, seems adaptive (Haselton and Nettle, 2006). For instance, Kenrick and colleagues (2002) state that "[a]n evolutionary perspective implies that some domain-specific goals will take priority over others. For example, one failure of self-protection has greater functional consequences than one failure in mate-seeking" (pp. 350-351). Thus, only when safety needs (and additional coalitional needs) are clearly met would it be most adaptive to pursue mating opportunities. Furthermore, kin and more extended social networks are vital for aiding in the raising of any offspring that result from mating, thus further establishing the importance of groups and interpersonal connection in securing evolutionarily beneficial outcomes such as finding mates and raising offspring to reproductive age.

An important practical implication for rejection research raised by the current findings is that we should be cautious about using acceptance as a baseline or control condition, as it may be driving the observed differences between the two conditions. Future research manipulating social affiliation should be careful to include some form of control condition to establish if social rejection and acceptance have independent and unique effects.

With regard to participants in the social rejection condition, the results of Study 2 appear, at first glance, inconsistent with past findings. Specifically, Maner et al. (2007) found that participants who felt socially rejected reported interest in a social networking

service that could help them make new friends. As seen in Table 1, rejected individuals in Study 2 did rate “making new friends” as more important than did accepted and control individuals, but the individual comparisons between rejection-acceptance and rejection-control were not significant. However, in a comprehensive analysis of situations in which rejected individuals desire and pursue reconnection, Maner et al. (2007) also revealed boundary conditions that moderate whether rejected individuals display affiliative tendencies. Specifically, they found that rejected individuals only displayed affiliative behavior when they believed they would have the opportunity to interact with whoever their behavior was directed toward; if actual social interaction was not possible, rejected individuals no longer displayed affiliative tendencies. Relating this to Study 2, our participants were asked how important “making new friends” currently was to them. It may be that rejected individuals’ responses to this statement varied based on the perceived likelihood that they could actually make new friends; a person who is feeling excluded but believes this can be changed might prioritize initiating friendships, whereas a similarly excluded person who believes reconnection will be difficult or impossible may not report the desire to pursue new friendships. In fact, these individuals may actually report devaluing friendship as a self-protective strategy.

Future directions and conclusion

Although promising in their own right, the current studies also generate a number of interesting future research inquiries. For example, perhaps individuals who are chronically lonely or who experience long-term social isolation will, on average, show less interest in mating than other individuals. Moreover, might socially included and excluded individuals simply differ in their interest in mating, as documented here, or do they also prefer different strategies toward mating based on the amount of resources they have available to invest in the first place? Perhaps included individuals, because their basic survival needs have been met, can afford to pursue more aggressive mating tactics. For example, a potential aggressive mating tactic of socially included individuals might be a greater propensity to endorse mate poaching behaviors because of one’s elevated, entitled status.

In summary, the current research provides novel evidence that social acceptance and group membership have important and unique effects on basic motives such as mating interest. Indeed, humans must constantly balance two fundamental challenges; those related to survival and those related to reproduction (Kaplan and Gangestad, 2005). The present results demonstrate that one’s level of social acceptance appears to be a significant cue to which problem must be most immediately attended to. Inasmuch as the experience of social inclusion, relative to either rejection or baseline functioning, is a proximal indication that one’s basic survival needs have been met, it motivates individuals to reprioritize their motives toward maximizing reproduction. Such an outcome appears consistent with several broad strains of evolutionary thinking, and highlights the centrality of group life and social belonging in pursuit of basic human goals such as survival and reproduction.

Notes

¹ We use the term “social rejection” to refer to rejection, ostracism, and exclusion, given that past research has not distinguished between the various types of exclusion (Williams, 2007).

² The faces were obtained, with permission, from the Productive Aging Lab face database (Minear and Park, 2004), from the Psychological Image Collection at Stirling (PICS; <http://pics.psych.stir.ac.uk/>), and from Jon K. Maner (Maner et al., 2005).

³ Although we were only interested in the effect of condition, we also conducted a 3 (target attractiveness level: high, moderate, low) \times 2 (participant sex: male, female) \times 3 (condition: rejection, acceptance, control) mixed ANOVA on participants' mating interest, with the first factor within-subjects. There was a significant effect of attractiveness level, $F(1.66, 117.55) = 251.08$, $p < .001$, such that mating interest was greater for highly attractive ($M = 4.52$, $SD = 1.95$) than for moderately attractive ($M = 2.78$, $SD = 1.21$) and unattractive ($M = 1.33$, $SD = .58$) targets. Participant sex also significantly affected mating interest, $F(1, 71) = 14.51$, $p < .001$, with males reporting more mating interest ($M = 3.29$, $SD = 1.00$) than females ($M = 2.58$, $SD = 0.74$). This is consistent with research showing that men, compared to women, are more interested in short-term mating and desire more sexual partners (e.g., Schmitt, Shackelford, and Buss, 2001). However, these main effects were qualified by a significant participant sex by target attractiveness interaction, $F(1.66, 117.55) = 59.18$, $p < .001$. Males reported significantly more interest ($M = 5.99$, $SD = 1.76$) in highly attractive targets than females ($M = 3.48$, $SD = 1.31$), $p < .001$. Males also reported significantly more interest ($M = 1.52$, $SD = 0.74$) in unattractive targets than females ($M = 1.20$, $SD = 0.38$), $p < .05$. However, for moderately attractive targets, females reported more interest ($M = 3.06$, $SD = 1.06$) than males ($M = 2.37$, $SD = 1.30$), $p < .05$. Importantly, condition did not interact with any of these variables.

⁴ This analysis was also conducted with participant sex as a factor. A 3 (condition) \times 2 (sex) \times 2 (affiliation type) mixed ANOVA revealed a main effect of affiliation type, $F(1, 44) = 50.47$, $p < .001$, consistent with the reported findings of the 3 \times 2 ANOVA. Additionally, there was a significant interaction between affiliation type and participant sex, $F(1, 44) = 4.12$, $p < .05$, such that females ($M = 6.38$, $SD = .82$) rated friendship as more important than males ($M = 5.46$, $SD = 1.48$; $p < .01$), but males and females did not differ in self-reported importance of dating, $p > .7$. This replicates past research showing that friendship (non-sexual affiliation) is more important to women (Ackerman, Kenrick, and Schaller, 2007; Tamres, Janicki, and Helgeson, 2002; Taylor et al, 2000). However, participant sex did not interact with condition ($p > .8$) nor was there a three-way interaction between sex, affiliation type, and condition ($p > .4$). Thus, participant sex was dropped from the analyses.

Received 26 August 2008; Revision submitted 17 November 2008; Accepted 15 December 2008

References

- Ackerman, J.M., Kenrick, D.T., and Schaller, M. (2007). Is friendship akin to kinship? *Evolution and Human Behavior*, 28, 365-374.
- Barton, R.A., and Dunbar, R.I.M. (1997). Evolution of the social brain. In A. Whiten, and R.W. Byrne (Eds.), *Machiavellian intelligence II: Extensions and evaluations* (pp. 240-263). New York: Cambridge University Press.
- Baumeister, R.F., Dwall, C.N., Ciarocco, N.J., and Twenge, J.M. (2005). Social exclusion impairs self-regulation. *Journal of Personality and Social Psychology*, 88, 589-604.

- Baumeister, R.F., and Leary, M.R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497-529.
- Baumeister, R.F., Twenge, J.M., and Nuss, C.K. (2002). Effects of social exclusion on cognitive processes: Anticipated aloneness reduces intelligent thought. *Journal of Personality and Social Psychology*, *83*, 817-827.
- Bernstein, M.J., Young, S.G., Brown, C.M., Sacco, D.F., and Claypool, H.M. (2008). Adaptive responses to social exclusion: Social rejection improves detection of real and fake smiles. *Psychological Science*, *19*, 981-983.
- Brewer, M.B. (2004). Taking the social origins of human nature more seriously: Toward a more imperialist social psychology. *Personality and Social Psychology Review*, *8*, 107-113.
- Cacioppo, J.T., Hawkley, L.C., and Berntson, G.G. (2003). The anatomy of loneliness. *Current Directions in Psychological Science*, *12*, 71-74.
- Campbell, D.T. (1983). The two distinct routes beyond kin selection to ultrasociality: Implications for the humanities and social sciences. In D. Bridgeman (Ed.), *The nature of prosocial development: Theories and strategies* (pp. 11-39). New York: Academic Press.
- Ellis, L. (1995). Dominance and reproductive success among nonhuman animals: A cross-species comparison. *Ethnology and Sociobiology*, *16*, 257-333.
- Fernald, R.D. (2006). The social control of reproduction: Physiological, cellular, and molecular consequences of social status. In S.M. Platek, J.P. Keenan, and T.K. Shackelford (Eds.), *Evolutionary cognitive neuroscience* (pp. 197-220). Cambridge, MA: MIT Press.
- Gardner, W.L., Pickett, C.L., and Brewer, M.B. (2000). Social exclusion and selective memory: How the need to belong influences memory for social events. *Personality and Social Psychology Bulletin*, *26*, 486-496.
- Gangestad, S.W., and Simpson, J.A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and Brain Sciences*, *23*, 573-587.
- Gintis, H., Smith, E.A., and Bowles, S. (2001). Costly signaling and cooperation. *Journal of Theoretical Biology*, *213*, 103-119.
- Gonsalkorale, K., and Williams, K.D. (2007). The KKK won't let me play: Ostracism even by a despised outgroup hurts. *European Journal of Social Psychology*, *37*, 1176-1186.
- Haselton, M.G., and Nettle, D. (2006). The paranoid optimist: An integrative evolutionary model of cognitive biases. *Personality and Social Psychology Review*, *10*, 47-66.
- Hayden, B. (1996). Feasting in prehistoric and traditional societies. In P. Wiessner and W. Schiefenovel (Eds.) *Food and the status quest: An interdisciplinary perspective* (pp. 127-147). Providence: Berghahn Books.
- Hopcroft, R.L. (2006). Sex, status, and reproductive success in the contemporary United States. *Evolution and Human Behavior*, *27*, 104-120.
- Kaplan, H.S., and Gangestad, S.W. (2005). Life history theory and evolutionary psychology. In D.M. Buss (Ed.), *The handbook of evolutionary psychology* (pp. 68-95). Hoboken, NJ: Wiley.
- Karremans, J.C., and Verwijmeren, T. (2008). Mimicking attractive opposite-sex others: The role of romantic relationship status. *Personality and Social Psychology*

Bulletin, 34, 939-950.

- Kenrick, D.T., Maner, J.K., Butner, J., Li, N.P., Becker, D.V., and Schaller, M. (2002). Dynamical evolutionary psychology: mapping the domains of the new interactionist paradigm. *Personality and Social Psychology Review*, 6, 347-356.
- Kenrick, D.T., Maner, J.K., Li, N.P. (2005). Evolutionary social psychology. In Buss, D. M. (Ed.), *The handbook of evolutionary psychology* (pp. 803-827). Hoboken, NJ: Wiley.
- Kruger, D.J., and Fisher, M.L. (2008). Women's life history attributes are associated with preferences in mating relationships. *Evolutionary Psychology*, 6, 289-302.
- Lakin, J.L., Chartrand, T.L., and Arkin, R.M. (2008). I am too just like you: Nonconscious mimicry as an automatic behavioral response to social exclusion. *Psychological Science*, 19, 816-822.
- Leary, M.R., Tambor, E.S., Terdal, S.K., and Downs, D.L. (1995). Self-esteem as an interpersonal monitor: The sociometer hypothesis. *Journal of Personality and Social Psychology*, 68, 518-530.
- Leary, M.R., Twenge, J.M., and Quinlivan, E. (2006). Interpersonal rejection as a determinant of anger and aggression. *Personality and Social Psychology Review*, 10, 111-132.
- MacDonald, K.B. (1997). Life history theory and human reproductive behavior: Environmental/contextual influences and heritable variation. *Human Nature*, 8, 327-359.
- Maner, J.K., DeWall, C.N., Baumeister, R.F., and Schaller, M. (2007). Does social exclusion motivate interpersonal reconnection? Resolving the "porcupine problem." *Journal of Personality and Social Psychology*, 92, 42-55.
- Maner, J.K., Kenrick, D.T., Becker, D.V., Robertson, T.E., Hofer, B., Neuberg, S.L., Delton, A.W., Butner, J., and Schaller, M. (2005). Functional projection: How fundamental social motives can bias interpersonal perception. *Journal of Personality and Social Psychology*, 88, 63-78.
- Minear, M., and Park, D.C. (2004). A lifespan database of adult facial stimuli. *Behavior Research Methods, Instruments, & Computers*, 36, 630-633.
- Pickett, C.L., and Gardner, W.L. (2005). The social monitoring system: Enhanced sensitivity to social cues as an adaptive response to social exclusion. In K.D. Williams, J.P. Forgas, and W. von Hippel (Eds.), *The social outcast: Ostracism, social exclusion, rejection, and bullying* (pp. 213-226). New York: Psychology Press.
- Pickett, C. L., Gardner, W. L., and Knowles, M. (2004). Getting a cue: The need to belong and enhanced sensitivity to social cues. *Personality and Social Psychology Bulletin*, 30, 1095-1107.
- Salmon, C.A., and Shackelford, T.K. (2007). Towards an evolutionary psychology of the family. In C.A. Salmon, and T.K. Shackelford (Eds.), *Family psychology: An evolutionary perspective* (pp. 3-15). New York: Oxford University Press.
- Schaller, M., Park, J.H., and Kenrick, D.T. (2007). Human evolution and social cognition. In R.I.M. Dunbar, and L. Barrett (Eds.) *The oxford handbook of evolutionary psychology* (pp. 491-504). Oxford: Oxford University Press.
- Schmitt, D.P., Shackelford, T.K., and Buss, D.M. (2001). Are men really more 'oriented' toward short-term mating than women? A critical review of theory and research.

Psychology, Evolution and Gender, 3, 211-239.

- Tamres, L.K., Janicki, D., and Helgeson, V.S. (2002). Sex differences in coping behavior: A meta-analytic review and an examination of relative coping. *Personality and Social Psychology Review*, 6, 2-30.
- Taylor, S.E., Klein, L.C., Lewis, B.P., Gruenewald, T. L., Gurung, R.A.R., and Updegraff, J.A. (2000). Biobehavioral responses to stress in females: Tend-and-befriend, not fight-or-flight. *Psychological Review*, 107, 411-429.
- Warburton, W.A., Williams, K.D., and Cairns, D.R. (2006). When ostracism leads to aggression: The moderating effects of control deprivation. *Journal of Experimental Social Psychology*, 42, 213-220.
- Williams, K.D. (2007). Ostracism. *Annual Review of Psychology*, 58, 425-452.
- Williams, K.D., Cheung, C.K.T., and Choi, W. (2000). Cyberostracism: Effects of being ignored over the Internet. *Journal of Personality and Social Psychology*, 79, 748-762.
- van Beest, I., and Williams, K.D. (2006). When inclusion costs and ostracism pays, ostracism still hurts. *Journal of Personality and Social Psychology*, 91, 918-928.
- Zadro, L., Williams, K.D., and Richardson, R. (2004). How low can you go? Ostracism by a computer is sufficient to lower self-reported levels of belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology*, 40, 560-567.