

## How Self-Evaluations Relate to Being Liked by Others: Integrating Sociometer and Attachment Perspectives

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What is the relation between self-evaluation and being liked by others? Does being liked by others lead to more positive self-evaluations (as in sociometer theory), or do positive self-evaluations lead to being liked more (self-broadcasting)? Furthermore, what might affect the extent to which self-evaluations are influenced by likability (and vice versa)? The purpose of the present study was twofold. First, it used a naturalistic design to test the direction of the effect between social self-evaluations and others' judgments of likability in real relationships. Second, it examined how individual differences in attachment avoidance and anxiety relate to self-evaluations and likability and whether attachment differences moderate the relation between the two. Social self-evaluations, actual interpersonal liking, and attachment were assessed in participants taking part in a longitudinal group study. The findings supported the sociometer theory: Being liked by others led to more positive self-evaluations. Both anxious and avoidant attachment predicted lower self-evaluations, and anxious attachment predicted stronger reactions to others' liking (i.e., potentiated the sociometer). These findings have several implications for research on self-evaluation, adult attachment theory, and the importance of integrating interpersonal processes and individual differences.

*Keywords:* interpersonal perception, self-evaluation, self-esteem, sociometer, attachment

An individual's self-evaluation is not just an isolated, introspective construction; rather, self-evaluations are feelings that are intricately embedded in social relationships and social experience. This close connection has been recognized since the early days of psychology. William James (1890) emphasized that people's feelings about themselves are closely linked to their standing in the eyes of lovers, friends, and neighbors. This link is of no little consequence, for one's lovers, peers, and neighbors are highly attuned social observers, able to form impressions that are quick (Bargh, 1997), meaningful (Ambady & Rosenthal, 1992; Gosling, Ko, Mannarelli, & Morris, 2002), and lasting (Kenny, Horner, Kashy, & Chu, 1992), even from minimal information.

If self-evaluations are indeed closely related to being liked by others, what is the underlying means by which they are connected? One possibility is that individuals' feelings about themselves may affect the way they present themselves to others and, thus, the

reactions they elicit. This argument is consistent with the theory that positive feelings about the self have social benefits (Taylor & Brown, 1988). Another possibility is that individuals' feelings about themselves may be affected by how others feel about them. This has been a central argument of a number of psychological theories of the self, such as the looking-glass self (Cooley, 1902; Mead, 1934) and, more recently, sociometer theory (Leary, Tambor, Terdal, & Downs, 1995).

Furthermore, self-evaluations and likability are not just arbitrary: They vary systematically between individuals. In particular, attachment theory posits that different individuals use different strategies to regulate interpersonal behavior and perceptions of relationships (Bowlby, 1969), which may have important implications for the social dynamics of the self. Individuals with different attachment histories may vary in how they feel about themselves, react to others, or elicit responses from others through their behavior.

In the present study, we tested the interrelations between how much a person is liked by peers and that person's self-evaluation. Specifically, we examined whether being liked by others leads to more positive self-evaluations in the social domain or whether more positive social self-evaluations lead to greater liking by others. We tested these questions using a design that incorporated naturalistic social interactions, that directly measured both self- and interpersonal perceptions, and that made it possible for effects in both directions to occur simultaneously. We also examined the implications of individual differences in attachment for these self-other dynamics.

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### Self-Evaluations and Interpersonal Processes: The Sociometer and Self-Broadcasting Perspectives

Several social psychological theories have addressed whether self-views either affect or are affected by others' views of an individual. In early social psychological work, theories of the "looking-glass self" proposed that individuals adopt others' perspectives in evaluating the self (Cooley, 1902; Mead, 1934). James (1890) argued that reputation is a key component of the self. More recently, the *sociometer hypothesis* (Leary et al., 1995) has suggested that a function of self-esteem is to provide individuals with information about interpersonal belongingness. The sociometer hypothesis is based on the assumption that it is adaptive to be close to others and to be included in social groups. According to the sociometer hypothesis, negative self-evaluations act as an intrapsychic signal, indicating failure to maintain an adaptive level of closeness to others.

In support of the sociometer hypothesis, several studies have shown that when participants in laboratory studies are given direct, explicit feedback from real or imagined social partners, they report lower self-esteem (Leary, Haupt, Strausser, & Chokel, 1998; Leary et al., 1995; Nezlek, Kowalski, Leary, Blevins, & Holgate, 1997). However, participants in laboratory paradigms often receive overt, explicit feedback and have an opportunity to engage in conscious deliberation about others' perceptions. A few naturalistic studies have demonstrated results consistent with the sociometer effect. Using lagged analyses in a diary design, Nezlek (2002) found that within-subject changes in quality of social interactions were followed by changes in self-rated social skills; another diary study found a significant lagged effect of felt acceptance on self-esteem in romantic relationships (Murray, Griffin, Rose, & Bellavia, 2003). However, these studies relied on subjects' own reports of others' evaluations of them, rather than directly measuring others' perceptions; and it could be argued that ratings of social skills are a form of self-knowledge rather than self-evaluation. Murray, Holmes, and Griffin (1996) did find sociometer-like effects in a study that directly measured how much individuals were liked by their romantic partners. One goal of the present study was to expand on the small but important body of evidence for the sociometer in naturalistic interactions.

Several researchers have hypothesized the converse of the sociometer—that an individual's self-evaluations may influence how much others like that individual (Buhrmester, Furman, Wittenberg, & Reis, 1988; Taylor & Brown, 1988; Taylor, Lerner, Sherman, Sage, & McDowell, 2003). We refer to this as the *self-broadcasting* perspective, because it implies that an individual acts out his or her self-evaluations in observable social behavior. The evidence for self-broadcasting effects is mixed, however (e.g., Bond, Kwan, & Li, 2000; Brockner & Lloyd, 1986; Heatherton & Vohs, 2000), and a recent narrative review of the self-esteem literature argued that self-esteem did not have a consistent effect on likability across different studies (Baumeister, Campbell, Krueger, & Vohs, 2003). However, the term *self-esteem* has been used in different ways in the literature, with some researchers defining it as a global self-evaluation and others as a self-evaluation in a particular domain, such as academics or social life. Furthermore, even global self-esteem is contingent on different domains in different individuals, including nonsocial domains (see

Crocker & Wolfe, 2001). In the present study, we measure self-evaluations in the social domain. We believe this affords a more sensitive test of both the sociometer hypothesis and the self-broadcasting hypothesis.

In summary, theory and research on the sociometer hypothesis suggest that positive evaluations by others affect self-evaluations. In addition, mixed evidence suggests that the reverse may be true—that self-evaluations may affect others' liking through self-broadcasting processes. The two views are not mutually exclusive, and thus either one, both, or neither theory might be correct.

### Attachment and the Social Self

Sociometer theory posits a fundamental human need to belong to social groups and to form bonds with others. Similar needs are postulated by attachment theory, which posits that humans possess powerful affective and behavioral regulation systems that maintain bonds and elicit care from others. These regulatory systems work in different ways for different individuals. Brennan, Clark, and Shaver (1998) examined various frameworks for describing individual differences in attachment in adulthood and found that two dimensions captured many of the important individual differences (see also Fraley, Waller, & Brennan, 2000). They labeled the first dimension *anxiety* because it captures the tendency to worry about being rejected or about not being able to get support from others. They labeled the second dimension *avoidance* (Brennan et al., 1998) because it contrasts individuals who tend to approach versus avoid intimacy and closeness with others. As shown in Figure 1, these two dimensions define the four attachment styles presented by Bartholomew and Horowitz (1991) as combinations of high and low anxiety and avoidance: Preoccupied individuals tend to use hyperactivating strategies, dismissing individuals tend to use deactivating strategies, secure individuals tend to use neither strategy, and fearful individuals tend to use both strategies in an arbitrary or disorganized way. In empirical analyses, anxiety and avoidance are distinct dimensions, with a low, near-zero correlation (e.g., Bartholomew & Horowitz, 1991; Brennan et al., 1998; Klohnen & John, 2003). Thus, it is possible that an individual who finds relationships to be distressing (high anxiety) might still value and seek closeness with others (low avoidance), and vice versa.

Research on the structure of individual differences has suggested that adults have different, specific attachment styles for different longstanding relationships but also that individuals may

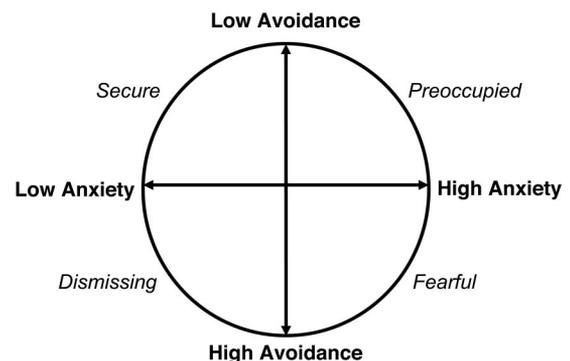


Figure 1. The two attachment dimensions (poles are labeled in boldface) and four attachment styles (in italics).

have a more general attachment style (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; Beer & Kihlstrom, 2004). In the case of a new relationship, for which there is no preexisting specific attachment style, an individual's general relational tendencies may act as a top-down guide for experience and behavior. We conducted the present study in groups of strangers and therefore examine individual differences in general attachment styles.

### *Anxiety and Avoidance: Implications for Self-Evaluations and Likability*

*Self-evaluations.* Several studies have found that individual differences in attachment have direct implications for self-evaluations. In particular, anxiety has been associated with lower global self-esteem (Bartholomew & Horowitz, 1991; Mickelson, Kessler, & Shaver, 1997) and attribution of negative traits to the self (Mikulincer, 1995). Avoidance has been associated with inflated self-evaluations in some studies (e.g., Mikulincer, 1995, 1998); however, the results seem to vary across different domains, with avoidance predicting lower self-evaluations in social domains and higher self-evaluations in competence domains (Brennan & Morris, 1997).

Mikulincer and Shaver's (2003) process model of interpersonal dynamics and individual differences in attachment suggests that the effects of anxiety and avoidance on self-evaluations may stem from different sources. In this model, individual differences in attachment anxiety reflect the tendency to use *hyperactivating strategies* when no attachment figure is available to provide comfort. Hyperactivating strategies involve intense efforts to gain the support of others as well as unusual vigilance to the closeness and availability of others. Individual differences in avoidance reflect a tendency to use *deactivating strategies*. Deactivating strategies involve efforts to protect oneself from the distress associated with lack of support from others, such as asserting one's independence and maintaining physical and psychological distance from others. Anxious individuals' lower self-evaluations relate to attempts to win others' support, whereas avoidant individuals' higher self-evaluations relate to attempts to demonstrate self-reliance (Mikulincer, 1998). Thus, avoidant individuals may rely less on the social domain to derive their sense of self-worth (Park, Crocker, & Mickelson, 2004).

*Likability.* Mikulincer and Shaver's (2003) model also suggests that hyperactivating and deactivating strategies have implications for others' perceptions of an individual. For example, if avoidant individuals strive to maintain social distance (a deactivating strategy), they may be less liked by others. Consistent with this hypothesis, some research suggests that attachment anxiety or avoidance may affect likability. Avoidant individuals self-disclose less to others, whereas anxious individuals tend to self-disclose easily, perhaps too easily (Keelan, Dion, & Dion, 1998; Mikulincer & Nachshon, 1991; Pistole, 1993). Individuals who self-disclose are generally liked better by others (Collins & Miller, 1994), which suggests that more avoidant individuals may elicit less liking from others. Additionally, overdisclosure can impede relationship formation (Collins & Miller, 1994). Thus, it is possible that anxiety and avoidance may both be associated with lower likability: Both hyperactivating and deactivating strategies may lead individuals to stray from a norm of moderate self-disclosure.

### *Anxiety and Avoidance: Implications for Sociometer Processes*

In addition to their direct implications for self-evaluations and evaluations by others, anxiety and avoidance might also have implications for how strongly self-evaluations are linked to others' evaluations—that is, hyperactivating or deactivating strategies might modulate the sociometer. Hyperactivating strategies may potentiate the sociometer, producing a "hair trigger" sociometer for anxiously attached individuals—that is, anxious individuals might react especially strongly to any fluctuations in others' liking. Conversely, deactivating strategies may depotentiate the sociometer, making avoidant individuals relatively insensitive to their social environments.

Several studies support the hypothesis that the attachment system could play a role in potentiating or depotentiating the sociometer. Attachment anxiety is associated with a high degree of vigilance to separation and high, chronic accessibility of attachment-related concepts (e.g., thoughts of proximity or of specific attachment figures), even under conditions in which there is little threat to the attachment system (Hazan & Shaver, 1987; Mikulincer, Birnbaum, Woddis, & Nachmais, 2000; Mikulincer, Gillath, & Shaver, 2002). If the vigilance underlying the sociometer is designed to help maintain closeness, then the sociometer may be especially sensitive for anxious individuals. Individual differences that are conceptually related to anxiety, such as trait self-esteem, have been shown to moderate the effects of social rejection (Nezlek et al., 1997). Avoidant individuals show reduced accessibility of attachment-related concepts, but only in certain circumstances: that is, under low cognitive load and following activation of attachment threat. Thus, avoidance may only depotentiate the sociometer in specific contexts.

### Overview of the Present Study

The present research examined questions about self-evaluations and others' evaluations in a longitudinal study of social interaction among strangers. The purpose of the study was twofold. First, is the relation between self- and others' evaluations in the social domain characterized by the sociometer perspective, the broadcasting perspective, or both? The longitudinal design examined participants as they became acquainted in small groups that met multiple times. This longitudinal design permitted lagged effects analyses that examined whether changes in self-evaluations were followed by changes in others' perceptions or vice versa. If the self-broadcasting prediction is correct, times when the individual has especially positive self-evaluations should be soon followed by times of increased liking by peers. If the sociometer prediction is correct, then times when an individual is especially well liked by peers should be soon followed by especially positive self-evaluations. A key advantage of the longitudinal design was that it allowed us to evaluate the sociometer and self-broadcasting perspectives within the same study design and in the same sample. These two viewpoints are often presented as contrasting explanations (e.g., Baumeister et al., 2003), but, in fact, it is possible that both (or neither) are true. Our study allows us to test both simultaneously within the same design, something that would be impossible in a random-assignment experiment or a cross-sectional correlational study.

Second, do individual differences in attachment directly influence self-evaluations or others' evaluations, and do attachment

differences moderate the relation between the two? Small groups have previously been shown to be a valid context in which to study attachment differences (Rom & Mikulincer, 2003; Smith, Murphy, & Coats, 1999). Previous research suggests that both anxiety and avoidance should be associated with lower self-evaluations and possibly negative evaluations by fellow group members. Additionally, if attachment anxiety is associated with hyperactivating strategies, which increase vigilance of others, then anxiety should increase the effect of others' evaluations on self-evaluations. Conversely, if attachment avoidance is associated with deactivating strategies, which increase social distance between self and other, then avoidance should decrease the effect of others' evaluations on self-evaluations.

## Method

### *Participants and Procedure*

Participants were undergraduates recruited from introductory psychology classes to participate in four weekly group meetings (mean age = 19.0,  $SD = 0.9$ ). The analyses in the present study were restricted to those participants who came to all four sessions of the study ( $N = 151$ ; 72% of the total number of participants who ever attended). Attrition analyses indicated that excluded participants did not differ significantly on attachment dimensions or on gender. At the start of the study, the participants were largely strangers to one another: Ninety-seven percent of all possible pairs reported that they had never met before, 2% indicated they had seen the other person around campus or were briefly acquainted, and fewer than 1% of possible relationships were characterized as preexisting friendships.

Before any group interaction, participants completed self-report individual-differences measures of attachment working models (Time 0). They then interacted in groups for the remainder of that session and for the three subsequent sessions. Groups ranged from 4 to 8 participants (mean group size = 5.5). Fifty-one percent of the total sample was female, and we made efforts to ensure that each group had similar numbers of men and women.<sup>1</sup>

During each of the sessions, an experimenter facilitated interaction by providing activities. These activities consisted of a group "Lost on the Moon" problem-solving exercise (Time 1), a self-disclosure task (Time 2; adapted from Aron, Melinat, Aron, Vallone, & Bator, 1997), a leaderless group discussion (Time 3; adapted from John & Robins, 1994), and the party game *Beyond Balderdash* (Time 4; Hasbro, Pawtucket, RI). Following each session, group members made ratings of themselves and each individual in their group.

### *Measures*

*Individual differences in anxiety and avoidance.* Individual differences in anxiety and avoidance were measured with the four-paragraph measure of attachment (Bartholomew & Horowitz, 1991). For this measure, participants read paragraphs that described four attachment styles and rated how well each paragraph described them on a scale from 1 (*not at all*) to 7 (*extremely*). Composites were computed to assess the two attachment dimensions. As shown in Figure 1, preoccupied and fearful individuals are high in attachment anxiety, and secure and dismissing individuals are low in anxiety. Thus, the anxiety composite consisted of the ratings for preoccupied, fearful, secure (reverse scored), and dismissing (reverse scored). Following similar logic, the avoidance composite consisted of the ratings for dismissing, fearful, secure (reverse scored), and preoccupied (reverse scored). The two dimensions had a low correlation ( $r = .06, p = .47$ ). Both composites were  $z$ -scored between subjects for all analyses.

*Others' liking.* Following each group meeting, participants rated all of their fellow group members on the item, "I like this person." Ratings were

made on a Likert-type scale from 0 ("*disagree very strongly*") to 10 ("*agree very strongly*").

An index of others' liking was computed from the round robin ratings on the basis of Kenny's (1994) social relations model, a theoretical model of interpersonal perception. We used the software program SOREMO (Kenny, 1998) to implement the social relations model analyses. For each participant, SOREMO calculates a target score, which is the aggregate of all other individuals' ratings of that individual, and a perceiver score, which is the aggregate of how the individual views others. In addition, SOREMO removes group differences; as a result, target and perceiver scores are statistically independent of group membership (for details of the analysis, see Kenny, 1994; Kenny & La Voie, 1984).

For present purposes, we were interested in the target scores, which we used as our measure of others' liking. A participant's target score is conceptually like an average of how much everyone else said they liked that participant, but it is more precise than a simple average because it includes a statistical correction to account for the fact that each person is rated by an overlapping but slightly different set of others (each individual's self-rating is excluded from the calculation of his or her target score). Because the target scores are centered within each group, they should be interpreted as indexing how well an individual is liked relative to the others in his or her group. Means were all zero by definition; standard deviations ranged from 0.44 to 0.54. Stability correlations of others' liking between different weeks ranged from .44 to .74.

*Self-evaluations.* In addition to the peer ratings, participants also provided self-reports following each group interaction. Self-evaluations in this study were assessed with the item "I am a likable person." Participants rated this item on a scale from 0 ("*disagree very strongly*") to 10 ("*agree very strongly*"). Mean self-evaluations ranged from 7.13 to 7.60; standard deviations ranged from 1.38 to 1.48. Stability correlations of self-evaluations between different weeks ranged from .55 to .74. We centered self-evaluations around the sample mean for all analyses.

## Results

The present study addresses two questions. First, how are self-evaluations and likability related to one another? To evaluate the basic assertions of the self-broadcasting and sociometer perspectives, we report the results of lagged effects models with no attachment predictors. Second, how do individual differences in attachment influence self-evaluations, others' evaluations, and any relations between them? To evaluate how self-other dynamics vary as a function of attachment styles, we report analyses that include the attachment dimensions as main effects and moderators.<sup>2</sup>

### *The Interpersonal Dynamics of Self-Evaluations and Others' Liking*

The first set of analyses was concerned with the relation between self-evaluations and others' liking. Were individuals who felt good about themselves subsequently liked better by others (i.e., self-broadcasting)? Did being liked by others lead to more

<sup>1</sup> For the purpose of another study, we also formed groups with similar numbers of individuals who scored above and below the median on shyness. We reran all analyses controlling for shyness, and only one effect reported in this article was substantially changed. We note that effect where it occurred.

<sup>2</sup> For all analyses involving attachment dimensions, we conducted follow-up analyses including interactions between the anxiety and avoidance dimensions. None of the interaction terms was significant in those analyses.

positive self-evaluations (i.e., the sociometer hypothesis)? To test these questions, we used cross-lagged regression analyses. Cross-lagged regressions establish directionality by testing whether one variable at one time is related to another variable at another time. They also rule out some alternative causal models, such as those involving contemporaneous correlation between variables (Rogosa, 1995).

This study included multiple time points nested within persons, who, in turn, were nested within groups; therefore, we conducted all analyses as multilevel models (Bryk & Raudenbush, 1992; Singer & Willett, 2003). First, we present in full detail the multilevel model with others' liking as the dependent variable (e.g., the test of the self-broadcasting effect). In subsequent sections, we present only abbreviated descriptions of the models, highlighting aspects of the models that differ from the first analysis.

*Self-broadcasting.* To test whether self-evaluations affected others' liking, we ran a multilevel model with lagged effects. The Level 1 (week-level) model was as follows:

$$other_{ij} = \pi_{0ij} + \pi_{1ij}other_{(t-1)ij} + \pi_{2ij}self_{(t-1)ij} + e_{ij} \quad (1)$$

In this equation, the term *other* denotes how much an individual was liked by others, and *self* denotes the same individual's self-evaluation. Thus,  $other_{ij}$  indicates the others' liking score at time  $t$  for person  $i$  in group  $j$ . Terms with subscript  $(t-1)$  are Lag 1 effects—that is, effects of the prior week.

At Level 2 (person), we controlled for gender differences in likability and also modeled a random effect of the intercept ( $r_{0ij}$ ) to account for individual differences in likability. At Level 3, we included a random effect of the intercept ( $\mu_{00j}$ ) to account for group differences in liking. In the analyses we report here, we treated other effects as fixed effects at Levels 2 and 3. When we ran models that included additional random effects, none of the findings reported in this article changed substantively; however, some of those models had convergence problems because of overparameterization, which led us to use the simpler models reported here.<sup>3</sup>

For Level 2,

$$\pi_{0ij} = \beta_{00j} + \beta_{01j}gender + r_{0ij} \quad (2)$$

$$\pi_{1ij} = \beta_{10j} \quad (3)$$

$$\pi_{2ij} = \beta_{20j} \quad (4)$$

For Level 3,

$$\beta_{00j} = \gamma_{000} + \mu_{00j} \quad (5)$$

$$\beta_{01j} = \gamma_{010} \quad (6)$$

$$\beta_{10j} = \gamma_{100} \quad (7)$$

$$\beta_{20j} = \gamma_{200} \quad (8)$$

Results of the multilevel analysis for others' liking are presented at the top of Table 1. The key test of the self-broadcasting prediction is the lagged effect of self-evaluations, term  $\pi_{2ij}$  in the Level 1 equation. As indicated in Table 1, the effect of self-evaluations on others' liking was estimated as 0.01 ( $p = .55$ ), which indicates that it could not be distinguished from a null effect. Thus, there was not support for the prediction that feeling good about oneself has positive consequences for being liked by others.

Table 1  
*Multilevel Models Predicting Others' Evaluations and Self-Evaluations*

Parameter	Estimate	SE	<i>t</i> test
DV: Others' evaluations			
Gender	0.05	0.02	2.20*
Lag-1 others' evaluations	0.36	0.04	9.23*
Lag-1 self-evaluations	0.01	0.01	0.60
DV: Self-evaluations			
Gender	0.11	0.05	2.13*
Lag-1 self-evaluations	0.62	0.04	17.30*
Lag-1 others' evaluations	0.26	0.10	2.63*

Note.  $N = 151$ . Gender is contrast coded (+1 for women, -1 for men). All other predictors are centered around their grand means.  
\*  $p < .05$ .

*Sociometer.* The sociometer hypothesis was evaluated with a model very similar to that used for the analysis of the self-broadcasting effect, except that now the dependent variable was self-evaluations. The Level 1 equation was as follows:

$$self_{ij} = \pi_{0ij} + \pi_{1ij}self_{(t-1)ij} + \pi_{2ij}other_{(t-1)ij} + e_{ij} \quad (9)$$

Results of this analysis are presented at the bottom of Table 1. The key term for evaluating the sociometer hypothesis is the lagged effect of others' evaluations on self-evaluations,  $\pi_{2ij}$  in the above equation. In this analysis, the effect of being liked by others on self-evaluations was estimated as 0.26 ( $p = .009$ ). This result supports the sociometer hypothesis: Individuals who were particularly well liked by others at one time had more positive self-evaluations at a later time.

An extension of the sociometer hypothesis is the question of whether sociometer effects are mediated by perceived regard. The term *perceived regard* refers to what a person thinks others think of him or her—for example, whether Sally thinks that others like her.<sup>4</sup> In the context of the sociometer hypothesis, mediation by perceived regard would be evidence that the sociometer effect

<sup>3</sup> Because we were using lagged effects as independent variables, a number of analyses produced near-zero variance estimates for the random effects. This is largely an artifact of the lagged modeling approach, because most of the individual- and group-level variance was included in the predictors. For example, in an analysis where self-evaluations are the dependent variable, one would ordinarily expect a substantial person-level variance component, reflecting stable individual differences in self-esteem. However, in a lagged effects model, most of the person-level variance is already accounted for in the fixed effects—that is, the Lag 1 self-evaluation predictor variable. For this reason, the random effects in these analyses are not particularly meaningful. It is possible to estimate both lagged effects and random effects simultaneously in a structural equation model (e.g., Curran & Bollen, 2001), but that approach would have precluded testing for interaction effects—hence, our choice of multilevel modeling for the present study.

<sup>4</sup> *Perceived regard* is the term used by Murray et al. (1996). Other terms used in the literature include *reflected appraisals* (Felson, 1989) and *metaperceptions* (Kenny, 1994).

operates within conscious awareness: People like Sally; therefore Sally (accurately) believes that others like her; therefore she feels better about herself. Most sociometer studies have used experimental procedures that allow for conscious mediation but do not directly test whether perceived regard is a necessary link in the causal chain.

In the present study, we asked participants to rate the item, “This person would enjoy being friends with me,” for each person in their group. By computing a target index on this variable, we were able to create a score for each participant’s perceived regard. We then entered this perceived regard score as a Level 1 predictor (in Equation 9) to test whether perceived regard mediated the sociometer effect. The results of the analysis showed that being liked by others still had a strong and significant effect on self-evaluations (effect = 0.21,  $p = .034$ ), suggesting that perceived regard was not a mediator of the sociometer. Rather, perceived regard had a separate, independent influence on self-evaluations (effect = 0.14,  $p = .002$ ).

*Attachment Influences on Self–Other Dynamics*

The first set of analyses was consistent with the basic sociometer hypothesis. In the next set of analyses, we tested whether individual differences in attachment directly influenced others’ evaluations and self-evaluations and whether attachment moderated the sociometer effect. First, we reran the model predicting others’ evaluations (i.e., the self-broadcasting model), but this time we included main effects of attachment to test whether attachment had direct implications for how much an individual was liked by others. Although we did not hypothesize any interactions, we also included interactions between attachment and self-evaluations. Second, we reran the model predicting self-evaluations (i.e., the sociometer model), but this time we included main effects of attachment as well as interactions between others’ evaluations and attachment. This tested both whether attachment differences related to differences in self-evaluations (main effects) and whether attachment differences potentiated or depotentiated the sociometer (interaction effects).

*Did attachment directly influence others’ liking or moderate self-broadcasting?* To address these questions, in the next analyses we used a model of self-evaluations that included anxiety (*anx*) and avoidance (*avd*) as both main effects and moderators of others’ liking in the Level 2 equations. For Level 1,

$$other_{ij} = \pi_{0ij} + \pi_{1ij}other_{(t-1)ij} + \pi_{2ij}self_{(t-1)ij} + e_{ij} \quad (10)$$

For Level 2,

$$\pi_{0ij} = \beta_{00j} + \beta_{01j}gender + \beta_{02j}anx + \beta_{03j}avd + r_{0ij} \quad (11)$$

$$\pi_{2ij} = \beta_{20j} + \beta_{21j}anx + \beta_{22j}avd \quad (12)$$

The results of this analysis are presented in Table 2. The results indicate that attachment dimensions did not have a direct influence on others’ liking. That is, neither an individual’s level of anxiety, estimated as  $-0.03$  ( $p = .32$ ), nor an individual’s level of avoidance, estimated as  $-0.01$  ( $p = .66$ ), predicted how well others would like that individual.

Table 2  
*Multilevel Model Predicting Others’ Evaluations, With Attachment Dimensions as Predictors*

Parameter	Estimate	SE	t test
Gender	0.07	0.03	2.64*
Lag-1 others’ evaluation	0.29	0.04	7.26*
Lag-1 self-evaluation	-0.00	0.02	-0.16*
Anxiety	-0.03	0.03	-1.02
Avoidance	-0.01	0.03	-0.44
Anxiety × Lag-1 Self-Evaluation	0.03	0.01	2.06*
Avoidance × Lag-1 Self-Evaluation	0.01	0.01	1.04

Note.  $N = 151$ . Gender is contrast coded (+1 for women, -1 for men). All other predictors are centered around their grand means.

\*  $p < .05$ .

However, we did find an unpredicted interaction between self-evaluation and attachment anxiety, with an interaction effect of 0.03 ( $p = .04$ ). To facilitate interpretation, we plotted the interaction in Figure 2. For an average person, self-evaluations had no relation to others’ liking, as shown in the earlier analysis. However, negative self-evaluations appear to have had somewhat different consequences for people who differed in attachment anxiety: Low-anxiety participants seemed to benefit from negative self-evaluations, whereas high-anxiety participants seemed to be harmed by them. We return to possible interpretations of this finding in the Discussion section.

*Did attachment directly influence self-evaluations or moderate the sociometer?* The two remaining questions are whether anxiety and avoidance predicted self-evaluations as well as sensitivity to others’ liking. To address these questions, in the next analyses we used a model of self-evaluations that included anxiety and avoidance as both main effects and moderators of others’ liking in the Level 2 equations. For Level 1,

$$self_{ij} = \pi_{0ij} + \pi_{1ij}self_{(t-1)ij} + \pi_{2ij}other_{(t-1)ij} + e_{ij} \quad (13)$$

For Level 2,

$$\pi_{0ij} = \beta_{00j} + \beta_{01j}gender + \beta_{02j}anx + \beta_{03j}avd + r_{0ij} \quad (14)$$

$$\pi_{2ij} = \beta_{20j} + \beta_{21j}anx + \beta_{22j}avd \quad (15)$$

The main effects of attachment on self-evaluations are presented in Table 3. The results indicate that attachment dimensions had direct influences on self-evaluations. The main effect of anxiety was  $-0.13$  ( $p = .01$ ), and the main effect of avoidance was  $-0.15$  ( $p = .003$ ), which indicates that both anxious and avoidant individuals had more negative self-evaluations.

The final question is whether attachment moderated the relation between self-evaluations and others’ liking. In multilevel models, moderating effects of Level 2 variables (e.g., anxiety and avoidance) on Level 1 variables (e.g., others’ liking) are modeled by using the Level 2 variables as predictors of the Level 1 effects. In this particular case, we did this in the second Level 2 equation listed above (Equation 15). In that equation, the dependent variable is  $\pi_{2ij}$ , which is the Level 1 effect of others’ liking on self-evaluation. Thus, in this analysis, a positive effect of anxiety in the last equation ( $\beta_{21j}$ ) would indicate that increases in anxiety increased the effect of others’ liking on self-evaluations. Similarly, a negative effect of avoidance ( $\beta_{22j}$ ) would indicate that increases in

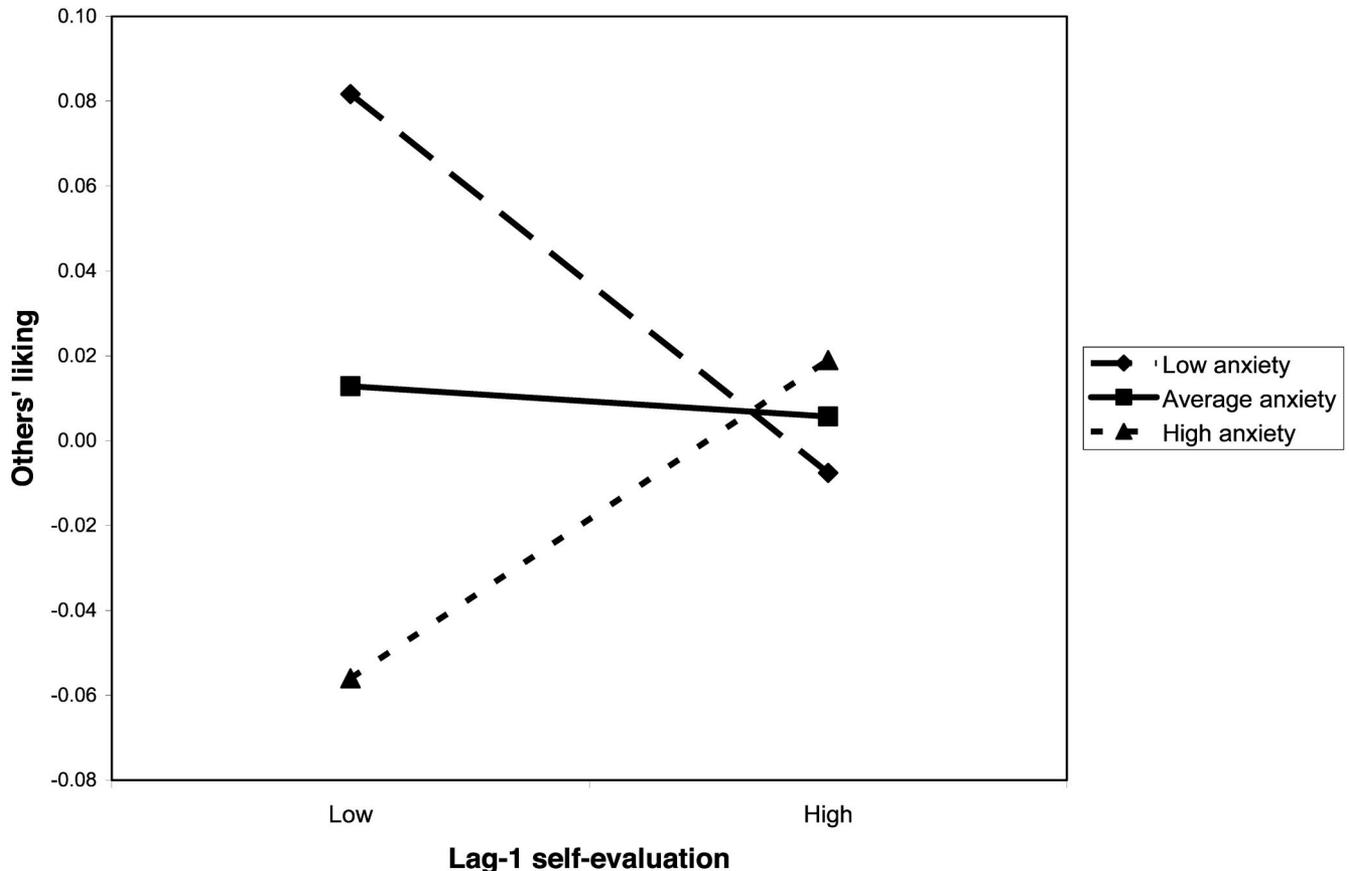


Figure 2. Others' liking as a function of Lag 1 self-evaluations and attachment anxiety, after Lag 1 others' liking was controlled. Low and high values were calculated on the basis of plus or minus one standard deviation.

avoidance decreased the effect of others' liking on self-evaluations. The results of the moderation analyses are presented in Table 3. The interaction between anxiety and others' liking was estimated as 0.24 ( $p = .02$ ), which indicates that attachment anxiety did moderate the sociometer effect.<sup>5</sup> The interaction of avoidance and others' liking was estimated as  $-0.01$  ( $p = .95$ ), showing no moderation. An additional analysis that also added perceived regard and an Attachment  $\times$  Perceived Regard interaction showed that perceived regard had an independent additive

effect (as in the earlier analysis without attachment) and did not interact with the attachment dimensions; in the expanded analysis, the effect of others' liking and its interaction with attachment anxiety remained significant and of similar size.

To aid in interpreting the moderating effect of anxiety on the sociometer, we graphed the interaction (see Figure 3). The solid line represents participants who were average with respect to attachment anxiety and shows the typical sociometer effect reported earlier. For individuals who were especially high in anxiety, the graph shows that the sociometer effect was stronger, as indicated by the steeper line. Conversely, for individuals who were especially low in anxiety, the graph indicates that their self-evaluations were quite high and relatively unaffected by what others thought of them.

Table 3

*Multilevel Model Predicting Self-Evaluations, With Attachment Dimensions as Predictors*

Parameter	Estimate	SE	<i>t</i> test
Gender	0.14	0.05	2.79*
Lag-1 self-evaluation	0.57	0.04	15.22*
Lag-1 others' evaluation	0.27	0.10	2.81*
Anxiety	-0.13	0.05	2.57*
Avoidance	-0.15	0.05	3.01*
Anxiety $\times$ Lag-1 Others' Evaluation	0.24	0.10	2.33*
Avoidance $\times$ Lag-1 Others' Evaluation	-0.01	0.10	0.06

Note.  $N = 151$ . Gender is contrast coded (+1 for women, -1 for men). All other predictors are centered around their grand means.

\*  $p < .05$ .

*Follow-Up Analyses With Gender*

Because our hypotheses were the same for men and women, the analyses reported so far included main effects of gender as a control variable but not interactions between gender and other

<sup>5</sup> The main effect of attachment anxiety was reduced to  $-0.08$  ( $p = .14$ ) when we entered shyness into this analysis. However, the moderating influence of anxiety on the sociometer was still strong and significant, even when we also entered shyness as a Level 2 moderator of the sociometer.

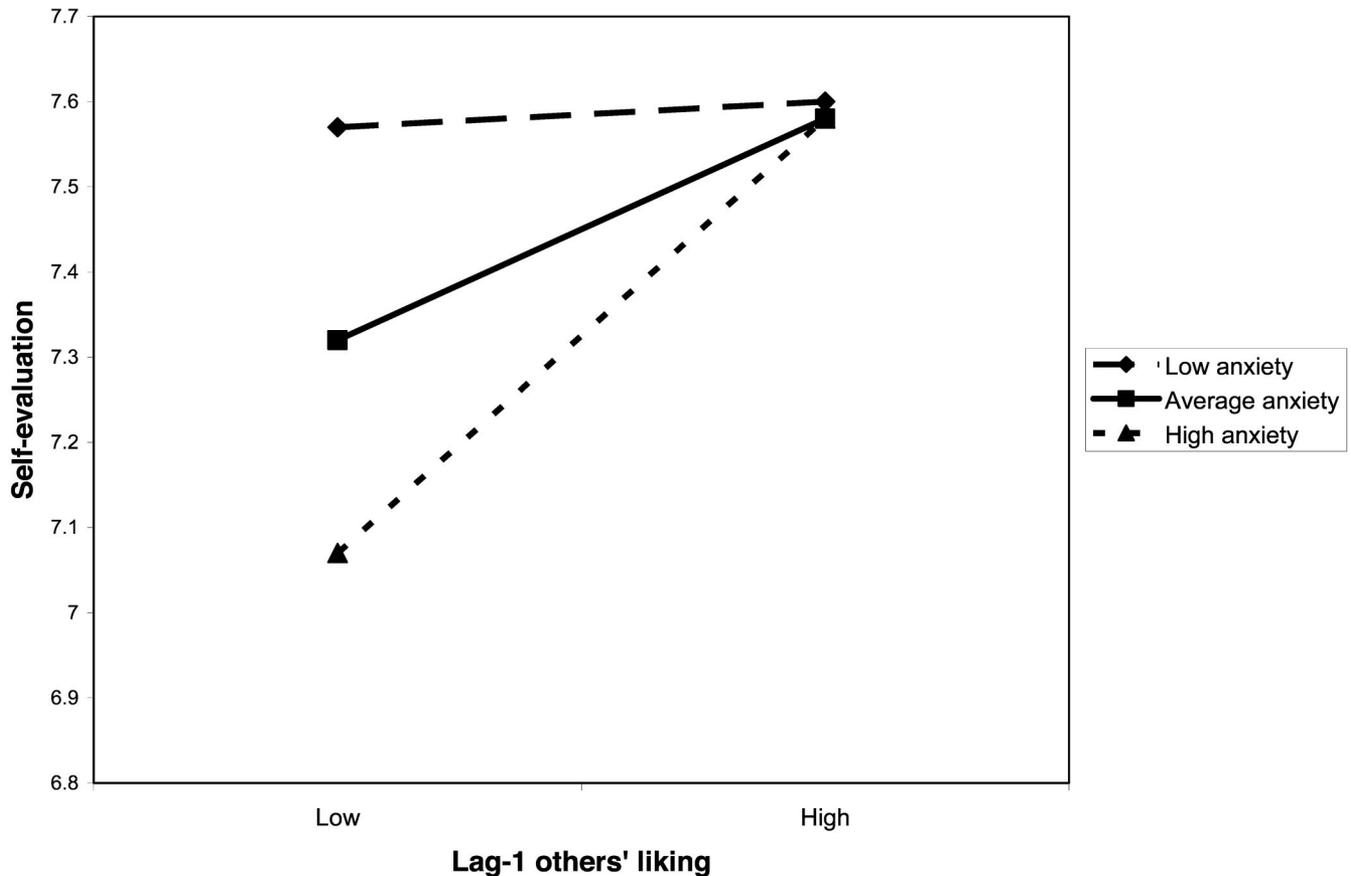


Figure 3. Self-evaluations as a function of Lag 1 others' liking and attachment anxiety, after Lag 1 self-evaluations were controlled. Low and high values were calculated on the basis of plus or minus one standard deviation.

variables. In a series of follow-up analyses, we tested models with interaction terms to see whether the major findings held up for both men and women. The basic sociometer effect was not significantly different for men and women, and the potentiating effect of anxiety on the sociometer also did not differ for men and women (e.g., there was not a significant three-way interaction among gender, anxiety, and others' evaluations in predicting self-evaluation). There was, however, an interesting though unexpected two-way interaction between anxiety and gender in predicting self-evaluations. When we split the sample by gender, we found that the main effect of anxiety on self-evaluations was significant for women ( $-.25, p < .001$ ) but not for men ( $.06, p = .47$ ), which indicates that this finding was only supported among women.

### Discussion

The present study addresses two broad issues. First, does being liked by others lead to more positive social self-evaluations, as predicted by sociometer theory, or do positive social self-evaluations lead to being better liked by others, as indicated by the self-broadcasting view? The results are consistent with the sociometer view but not the self-broadcasting view. Second, how do individual differences in attachment affect self-evaluations and others' liking, and do they moderate the relation between the two?

Higher levels of attachment anxiety and avoidance each predicted lower self-evaluations, though the effect of anxiety was only supported among women in this sample. Furthermore, attachment anxiety potentiated the sociometer: That is, the effect of others' liking on self-evaluations was stronger for those individuals who were more anxiously attached. In the remainder of this article, we discuss the implications for research on self-evaluation and adult attachment. We also discuss the benefits of integrating interpersonal process research with individual-differences approaches.

### The Social Regulation of Self-Evaluation

Although it is often of heuristic value to study individual and social aspects of the self separately (e.g., Sedikides & Brewer, 2001), it is hard to imagine any conceptualization of the self that makes no reference to social life; but how is the self embedded in social contexts? This study examines two possibilities: Self-evaluations affect how others evaluate the individual (i.e., self-broadcasting), and others' evaluations affect self-evaluations (i.e., sociometer hypothesis). These two ideas are not mutually exclusive, but the findings in this study are consistent primarily with the sociometer theory of Leary et al. (1995; Leary & Baumeister, 2000).

Currently, theories of self-evaluation focus on biases that arise from individual motivations, such as self-verification and self-

enhancement (i.e., Sedikides & Strube, 1995; Swann & Schroeder, 1995; Taylor & Brown, 1988). The sociometer hypothesis complements those perspectives by drawing attention back to more traditional views of self-evaluations, which focus on social regulation of the self (i.e., Cooley, 1902; Mead, 1934). In other words, social relationships can change the self. These findings also suggest that the social embeddedness of the self is not necessarily a culturally specific phenomenon. For example, the findings from the present study, which was conducted in an American university context, might not be consistent with theories that associate socially embedded selves with interdependent cultures (Markus & Kitayama, 1991).

One important consideration in interpreting the findings, and a possible limitation, is that we assessed bidirectional influences between self-evaluations and others' liking over a time lag of 1 week. Participants interacted with one another, filled out questionnaires, and then went home; the study tests whether feelings about the self and about others had consequences that were detectable 1 week later. On the one hand, the effects of others' liking on self-evaluations needed to be fairly robust to be evident after such a time interval. On the other hand, conclusions drawn from lagged effects designs are specific to the interval studied, because such designs are not optimized for detecting effects that emerge over substantially shorter or longer intervals. It is possible that there were real and immediate self-broadcasting effects that faded over a week because of forgetting and thus were not detected in this study. Alternatively, it is possible that individuals with negative self-evaluations may make slow, gradual changes to their interpersonal style—too gradual to be detected across a 1-week lag—to rehabilitate their standing in the eyes of others. The latter possibility fits in with the broader functional perspective of sociometer theory: The informational value of low self-evaluations would be useless if individuals did not change their behavior as a consequence.

In the analyses of attachment interactions, we did find conditional evidence for a self-broadcasting effect of sorts, although it was not consistent with the way self-broadcasting is usually conceptualized. On average, there was no self-broadcasting effect. However, individuals unusually high in anxiety appeared to show a conventional self-broadcasting effect, and individuals unusually low in anxiety seemed to show a "reversed" self-broadcasting effect. The plot (see Figure 2) indicates that high- and low-anxiety individuals were most different from one another when they had negative self-evaluations. One possible interpretation is that a negative self-evaluation means different things for people with different attachment styles: For low-anxiety individuals, it may reflect a socially valued form of modesty, whereas for high-anxiety individuals it may be part of a pattern of self-derogation or low social self-efficacy. Such interpretations at this point are speculative, however, and the finding should be replicated before being strongly interpreted.

### *Conscious Mediation and Perceived Regard*

The analysis of perceived regard raises some interesting possibilities with respect to conscious mediation. Our analysis indicates that the effect of others' liking on self-evaluation was not mediated by awareness of others' liking. Rather, thinking others like one and actually being liked had independent influences on self-evaluations. This finding is not pivotal to the test of the sociometer or self-broadcasting hypotheses (neither of which takes an absolute

position on conscious mediation), though it potentially goes some way in explaining how the sociometer works.

However, the finding should be treated with some caution, as the perceived regard item (i.e., "This person would enjoy being friends with me") was not exactly parallel to the item for others' liking (i.e., "I like this person"). It is also possible that the item we used to measure social self-evaluation (i.e., "I am a likable person") was influenced by perceived regard in some way that controlling for the "friends" item did not fully account for. In retrospect, the study would have afforded a stronger test of conscious mediation if we had measured perceived regard with the item, "This person likes me," and computed a target score from it.

Nevertheless, the finding is provocative and warrants further study. If replicated, it would suggest that a person's sense of self can be affected by others' evaluations even when the person does not know what others really think. This suggests that the sociometer effect does not rely on conscious deliberation, though the independent effect of perceived regard suggests that consciously accessible beliefs have a separate impact on the self. Such a finding is consistent with dual-process models in social psychology (Chaiken & Trope, 1999), in which behaviors can be shaped by both nonconscious (automatic) processes and conscious (controlled) processes. Researchers have found nonconscious influences for a number of higher mental processes, including social judgment and self-perception (e.g., Bargh & Ferguson, 2000). Such models often conceptualize nonconscious processes as working like associative networks. The results of the present study are consistent with a dual-process model, and a nonconscious sociometer effect suggests that, in an associationist interpretation, representations of the self can be directly activated or even shaped by others' social behavior.

### *Making Connections to Attachment Theory*

The present study also has implications for research on adult attachment theory. Individual differences in attachment styles directly predicted self-evaluations: Both anxiety and avoidance were associated with more negative self-evaluations. Previous studies have found a relation between attachment anxiety and negative self-evaluations among both men and women (Bartholomew & Horowitz, 1991; Mickelson et al., 1997). The present study supports this effect as well, but only among women.

Previous research on the relation between attachment avoidance and self-evaluations has been mixed. The present study found that avoidance led to lower self-evaluations, but it is important to note that the context was interpersonal and that we measured self-evaluations as self-rated likability. Individuals can base their global self-esteem on many sources (Crocker & Wolfe, 2001), and it may be that when avoidant individuals report high degrees of competence in nonsocial domains, they are compensating for their lower self-worth in the social domain (Brennan & Morris, 1997; Mikulincer, 1998).

The present study also found that anxious individuals had a more reactive sociometer—that is, anxious individuals were more responsive to how much others liked them. The finding that anxiety potentiated the sociometer provides a conceptual link between functionalist accounts of attachment and of the sociometer. Attachment anxiety is theorized to arise from a history of inconsistent caregiving. Inconsistent caregiving may teach individuals to persist in attempts to gain physical proximity and emotional support even at times when proximity and support seem unavailable (Bowlby, 1969). If anxiety does result from such inconsistent

caregiving, then a highly sensitive sociometer could be a functional adaptation: Support is not always be available, so the individual has to be ready to react quickly when it is. By contrast, we found that avoidant individuals were not insensitive to how much others liked them. Previous studies have found that the effects of avoidance on social information processing may only be evident when threats to the attachment system are activated (Mikulincer & Shaver, 2003). It is possible that avoidant individuals did not construe the small group interactions as an attachment-relevant situation and thus had no reason to disengage from the group.

One finding that deserves further examination is the lack of attachment effects on others' liking. One the one hand, we could argue that if the social context created in the present study activated attachment concerns, then such concerns should have guided how individuals engaged in group interactions and thus affected the way they were perceived. However, it is important to keep in mind that participants' relationships with each other were created anew at the beginning of the study. As relationships are starting to form, the overt behavioral markers of attachment—such as seeking physical proximity during times of distress—do not emerge as early as do more subtle aspects of attachment, such as thinking about another as a safe haven (Trinke & Bartholomew, 1997). The effects that we observed were intrapsychic. It is possible that if we had given these relationships time to grow, overt social behavior would have become more strongly affected by differences in attachment styles, as has been found in studies of existing relationships (e.g., Simpson, Rholes, & Phillips, 1997).

*Attachment as a transactional system.* In broader terms, the findings from this study support a transactional view of the attachment system. Specifically, the anxiety effect may be construed as a reactive transaction, because different individuals were reacting to others' dislike in different ways (Caspi & Roberts, 1999). This suggests that different individuals interacting in the same environment were having quite different experiences, even if they were treated similarly by the group. One implication is that low-anxiety individuals may find it easier to interact with a broader range of people, including people who do not necessarily like them. Low-anxiety individuals may be less likely to be adversely affected by others' opinions of them. Anxious individuals, by contrast, might have difficulty maintaining social relationships with people who do not provide them with relatively high levels of acceptance and support.

Murray, Rose, Bellavia, Holmes, and Kusche (2002) reached a similar conclusion about low self-esteem in romantic relationships. They found that, when faced with a partner's negative evaluation, low self-esteem individuals were more likely to view that as a sign that their relationship was in trouble, whereas high self-esteem individuals were buffered against their partners' evaluations. In the longer run, such reactive transactions may lead to yet another kind of transaction, selective transactions. That is, individuals who are particularly vulnerable to others' low evaluations may have difficulty maintaining long-term friendships or partnerships, because they may be more ready to terminate their relationships after a brief or transient lapse in support.

*Attachment and social groups.* Although the primary focus of this study is not group processes, the findings have implications for the small but growing literature on the role of attachment in social groups. For example, the findings support the idea that individual differences in attachment affect group processes. Previous studies of attachment in groups have typically focused on participants' perceptions of their group, such as their attachment to their group

(Smith et al., 1999) or their perceptions of group cohesion (Rom & Mikulincer, 2003). In the present study, we focus on the converse: How participants were perceived by (members of) their group. Future research on attachment and social perception in groups may benefit if researchers treated the group as both a perceiver and a target of perceptions.

*Alternative conceptualizations of attachment dimensions.* Although we relied substantially on a theoretical framework that conceptualizes attachment anxiety and avoidance as reflecting hyperactivating and deactivating strategies, that framework is not the only way that researchers have interpreted these two dimensions. Some researchers have interpreted anxiety as reflecting a threat detection system and avoidance as a behavior regulation system (Fraley & Shaver, 2000). This interpretation is consistent with the finding that anxiety but not avoidance moderated sociometer effects. From this interpretation, one might also predict that avoidance would be more strongly related to likability, as avoidance is thought to regulate proximity-seeking behavior. Thus, the lack of a reliable effect of avoidance on likability complicates such an interpretation, as we have already discussed.

Another interpretation of the attachment dimensions is that anxiety reflects negative versus positive models of self and avoidance reflects negative versus positive models of others (Bartholomew & Horowitz, 1991; Klohnen & John, 1998, 2003). This framework clearly predicts that attachment anxiety should be associated with negative self-evaluations, as we found in the present study. Because this interpretation highlights the connections between anxiety and self-esteem, it also highlights similarities to studies that have found that self-esteem moderated how reactive individuals were to a partner's low regard (Murray et al., 2002). However, under this view, avoidance is interpreted as a general model of others. Such an interpretation also implies that avoidance depotentiates the sociometer, as avoidant individuals are expected to derogate others' evaluations of them, and we did not find evidence for this. Furthermore, avoidance predicted negative self-evaluations, a finding that is difficult to reconcile with this theory.

Approaches to attachment that focus on types or styles rather than dimensions might put the findings in a different light. For example, both secure and dismissing attachment styles are low in attachment anxiety (see Figure 1), but the reasons for their relatively nonreactive sociometer might be very different. Secure people might be able to draw on other (probably internalized) sources of support when a group dislikes them, whereas dismissing people simply may not care what others think of them.<sup>6</sup> The present study was not well-suited to test this possibility, but it would be an interesting hypothesis for future research.

### *The Importance of Integrating Interpersonal Processes and Individual Differences*

A final implication of the present research is the benefits of integrating studies of interpersonal processes with individual-differences approaches. The integration of interpersonal processes and individual differences brings to light several findings that would not have been evident within either paradigm alone. In particular, the results suggest that an interpersonal process previ-

<sup>6</sup> We are grateful to an anonymous reviewer for suggesting this possibility.

ously conceptualized as universal, the sociometer effect, is in fact moderated by individual differences in attachment. The nature of the moderating effect was such that the average person showed a sociometer effect (see Figure 1), but the strength of that effect varied across individuals as a function of attachment anxiety. This finding raises the broader point that research on interpersonal processes could benefit if researchers consider individual differences, and vice versa.

Another important point raised by the findings is that self-evaluations are quite complex. It is certainly not the case that state/situational and trait/stable conceptualizations of self-evaluations are mutually exclusive, and the substantial literature on self-esteem supports the point that an individual's self-evaluation at any moment reflects both situational and stable influences (e.g., Crocker & Wolfe, 2001; Trzesniewski, Donellan, & Robins, 2003). However, the results of this study indicate that situational and stable influences on self-evaluations are not merely additive. Although there may be very good practical reasons for researchers to randomize away individual differences in experimental studies of the self or to aggregate away situational influences in correlational designs, these practical steps make it impossible to detect person-environment interactions. To advance theories of the self, future research on self-evaluations needs to include paradigms outside the neat boundaries of the experimental and correlational traditions.

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