

# Anxiety Doesn't Become You: How Attachment Anxiety Compromises Relational Opportunities

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Although research has shown that attachment anxiety is detrimental to ongoing relationships, less is known about whether and how it affects the earliest stages of relationship initiation. How does attachment anxiety affect an initial interaction with a potential relationship partner? The present investigation explored the interpersonal outcomes associated with attachment anxiety in the context of various relational opportunities, testing a mediational model whereby interpersonal displays characteristic of state social anxiety—social disengagement and manifest anxiety—were proposed as mechanisms of interpersonal failure. In Study 1, participants engaged in speed-dating. In Study 2, participants were videotaped introducing themselves to an attractive, single, preferred-sex confederate who would ostensibly be deciding whether to meet them. In Study 3, participants were videotaped having a semistructured 40-min interaction with an attractive, friendly, single, preferred-sex confederate. Across all 3 contexts, attachment anxiety was associated with negative interpersonal outcomes, mediated by displays of social disengagement (Study 2) and manifest anxiety (Studies 1 and 3). The negative displays and outcomes associated with attachment anxiety were expressed behaviorally as verbal disfluencies and interpersonal awkwardness (Study 3). Overall, attachment anxiety was a robust predictor of interpersonal failure when presented with a relational opportunity. Such failures will reinforce the negative expectations underpinning state social anxiety, making it harder for more anxiously attached individuals to initiate and develop the satisfying relationships that might over time help them overcome their relational insecurity.

**Keywords:** attachment anxiety, interpersonal behavior, initial interactions, relationship initiation, speed-dating

It is a truth universally acknowledged, that a single man in possession of a good fortune must be in want of a wife.

—Jane Austen, *Pride and Prejudice*

With apologies to Austen, this truth about desiring a mate is nearly universally acknowledged for men and for women, regardless of their fortune (cf. DePaulo & Morris, 2005). Humans have a fundamental need for social connectedness; in adulthood our close friendships and

especially our romantic relationships are key resources in satisfying this need (Baumeister & Leary, 1995). These relationships are founded on some initial interaction between two potential relationship partners—a relational opportunity. Successfully navigating a relational opportunity is the first hurdle we must overcome to initiate the challenging process of relationship formation.

In the present research we sought to apply attachment theory (Bowlby, 1969/1982)—one of the most popular theories for investigating the subsequent stages of relationship development and maintenance—to the context of initial interactions and relationship initiation. Specifically, we were interested in whether individual differences in chronic attachment security and insecurity would affect people's behavior in initial interactions and whether patterns of behavior characteristic of insecurity would compromise the possibility for relationship initiation. As detailed below, we hypothesized that the anxious form of attachment insecurity would be particularly problematic when navigating a relational opportunity. By integrating attachment theory with the self-presentational theory of social anxiety (Leary, 2010; Schlenker & Leary 1982), we developed a mediational model whereby attachment anxiety compromises relational opportunities via characteristic behavioral displays during these interactions.

## Attachment Theory

Attachment theory (Bowlby, 1969/1982) proposes that we develop mental models of the self and others in relationships based on early experience with primary caregivers, and that these mental models guide our behavior, cognitions, and motivations through-

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Data collection, analysis and manuscript preparation were supported by fellowships to M. Joy McClure from the Social Sciences and Humanities Research Council (SSHRC) of Canada, the Fonds québécois de recherche sur la société et la culture, and McGill University, as well as by an SSHRC grant to John E. Lydon. We thank Jessica Brown, David Canella, Christine Gros, Sylviane Houssais, Kirstie Kellman-McFarlane, Carolyne Lee, Andrew MacMillan, Alora Martin Downie, Steve Menard, Alla Muldanov, Victoria Timmermanis, Simcha Samuel, Amélie Zonato, and other research assistants too numerous to name for their efforts at various stages of data collection. We thank the Lydon, Bolger, and Shrout lab members for their feedback at various stages, particularly Niall Bolger, Chris Crew, Sean Lane, Sara Quinn, Pat Shrout, and Joy Xu.

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out the lifespan (Ainsworth, Blehar, Waters, & Wall, 1978; Hazan & Shaver, 1987, 1994; Mikulincer & Shaver 2003, 2007a). Depending on the reliability and availability of our significant others as sources of support, we develop individual differences in the functioning of these mental models: If these others are responsive to our needs, and are a reliable source of support that we can turn to in times of distress, we develop a sense of attachment security. If others are unresponsive or unreliable, we develop a sense of attachment insecurity. Depending on the particular relational contexts we encounter, this insecurity can take on two forms: If others are consistently unsupportive, we develop attachment avoidance, conceptualized as a discomfort with closeness and dependence (Brennan, Clark, & Shaver, 1998). People who are high in attachment avoidance disdain others as a source of security and are instead compulsively self-reliant (Fraley & Shaver, 1997; Mikulincer, Dolev, & Shaver, 2004). By contrast, if others are inconsistent sources of support, we develop attachment anxiety, which is conceptualized as a fear of abandonment and rejection (Brennan et al., 1998). Individuals who are high in attachment anxiety rely on others for security, seeking dependence and merging; they are preoccupied with their relationships due to their chronic fears that the other will leave them. Despite their strong motivation to bond with others, they tend to experience relationship dissatisfaction and dissolution (Collins & Read, 1990; Hazan & Shaver, 1987; Mikulincer & Shaver, 2007a).

Although originally formulated typologically in the developmental literature, current work in adult attachment conceptualizes individual differences in attachment as existing in a continuous plane described by the two dimensions of avoidance and anxiety (Brennan et al., 1998; Fraley, Waller, & Brennan, 2000). The present investigation follows this conceptualization. An enormous body of literature has detailed the various ways in which attachment security and insecurity affect ongoing adult relationships (for a review, see Mikulincer & Shaver, 2007a). This includes many studies that have sustained the tradition of observing actual interpersonal behavior that was established in early attachment research (e.g., Campbell, Simpson, Boldry, & Kashy, 2005; Collins & Feeney, 2000). However, much less is known about how the attachment system operates during relational opportunities (Creasey & Jarvis, 2008; Finkel & Eastwick, in press; Mikulincer & Shaver, 2007a). In the following sections we develop our theoretical framework for studying how individual differences in attachment affect behavior and outcomes in relationship initiation contexts.

### Attachment Theory in the Relationship Initiation Context

Previous attachment research has focused on relationships with specific partners with whom one has a rich history of important relational experiences, called attachment figures (Hazan & Shaver, 1994; Mikulincer & Shaver, 2007a). An interaction with a potential partner, with whom one may or may not someday form and develop a relationship, is obviously different from an interaction with an attachment figure, but there are two important reasons why we would still expect the attachment system to be activated and potentially influence behavior. First, Bowlby (1969/1982) highlighted that one of the particular utilities of our attachment mental models was that they could be generalized; that is, when faced with

novel relational situations, they provide top-down heuristics to guide our behavior and help us achieve the goal of felt security (see also Brumbaugh & Fraley, 2006; Collins & Read, 1994; Thompson, 1999). Indeed, as Mikulincer and Shaver (2007a, p. 286) suggest, in an initial interaction with a potential partner, about whom we have so little information and no pattern of previous interaction upon which to draw, we are likely to “detect the purest effects of chronic working models on relational behavior.” Second, theory clearly states that the attachment system is activated by the perception of either physical or psychological threat to the self (Bowlby, 1969/1982; Mikulincer, Birnbaum, Woddis, & Nachmias, 2000; Mikulincer & Shaver, 2003). Inherent to the context of relationship initiation are the threats of social evaluation and of potential rejection, which are among the most fundamental psychological threats to the self (MacDonald & Leary, 2005). Thus, we propose two reasons why the attachment system influences behavior in relationship initiation contexts: The generalizability of attachment models to novel situations and the threat-triggered activation of the attachment system.

Given that there are differences in how the two forms of attachment insecurity affect attachment system activation, it becomes apparent that the anxious form of insecurity is especially likely to be problematic when meeting a potential partner whereas the avoidant form of insecurity may be less of an issue. High attachment avoidance is associated with chronic deactivation of the attachment system (Cassidy & Kobak, 1988; Mikulincer & Shaver, 2003); consequently, people high in attachment avoidance may be unlikely to refer to their attachment mental models to guide behavior unless attachment system activation is strongly indicated. Moreover, the characteristic response to threat for people high in attachment avoidance is to down-regulate, devalue the threat and deactivate the system (Cassidy & Kobak, 1988; Mikulincer & Shaver, 2003). Therefore, even in the face of a threat that triggers initial activation (e.g., the possibility of rejection), activation may not persist long enough to engender characteristic patterns of behavior for people high in avoidance. By contrast, high attachment anxiety is associated with chronic hyperactivation of the attachment system (Cassidy & Kobak, 1988; Mikulincer & Shaver, 2003) as well as with hypervigilance for and heightened sensitivity to the threat of rejection (Downey & Feldman, 1996; Murray, Holmes, & Collins, 2006)—an up-regulation instead of the down-regulation associated with avoidance. Therefore, when individuals higher in attachment anxiety are faced with a relational opportunity, because of chronic hyperactivation and hypervigilance to threat, attachment system activation is not only likely but may be potentially intrusive and problematic.

### Attachment Anxiety, the Motivation–Expectation Mismatch, and Social Anxiety

One of the key issues that might arise from this intrusive activation of more anxiously attached individuals’ sensitive and vigilant attachment systems is a mismatch between motivation and expectation that would make relational opportunities especially distressing. On one hand, people higher in attachment anxiety are desperately motivated to form strong interpersonal connections, and have heightened desires for closeness and even merging with others (Brennan et al., 1998; Mikulincer & Shaver, 2003). On the other hand, they are unlikely to believe that their efforts to connect

will succeed, instead expecting rejection (Downey & Feldman, 1996).

This mismatch between the motivation to connect and the expectation of being rejected are precisely the conditions identified by Leary and colleagues as leading to the experience of social anxiety (Leary, 2010; Schlenker & Leary 1982). Social anxiety arises when we are motivated to present ourselves in a desired way (e.g., as an appealing prospective relationship partner) but we doubt our potential to do so, anticipating that we will be rejected or otherwise devalued. Anyone might feel socially anxious in an initial interaction with a desired potential relationship partner—everyone wants to be accepted, and only the most confident among us would be completely assured of his or her own appeal. However, people high in attachment anxiety are likely to be especially susceptible to social anxiety because relationship initiation contexts potentiate a chronic ambivalence between their hopes of acceptance and fears of rejection (McClure, Bartz, & Lydon, 2013; Mikulincer, Shaver, Bar-On, & Ein-Dor, 2010). As will become clear in the following section, it is useful to unpack the intrapsychic states (cognitions, motivations, and affective states) that may arise in this context and that may be exacerbated by attachment anxiety before we proceed to the interpersonal displays that will be the mechanisms of success or failure (cf. Shaver & Mikulincer's, 2011, model of attachment and interpersonal behavior).

Drawing the connection between attachment anxiety and social anxiety may seem intuitive or nearly tautological. Indeed, we are not the first to do so: For example, Vertue (2003) proposed a detailed integration of various theories of social anxiety and social phobia under a broader attachment theory framework. Nonetheless, we are not aware of any work that has examined how these intrapsychic constructs (i.e., the trait-like mental models associated with attachment anxiety and the state of social anxiety) influence actual interpersonal behavior and therefore lead to negative interpersonal outcomes in relational opportunity contexts. This may be because, as Vertue noted, “traditionally, social anxiety has been investigated in nonintimate relationships, and attachment theory has been applied primarily to intimate relationships” (Vertue, 2003, p. 177). The context of relationship initiation, which begins with an initial interaction between two potential intimates, seems like an ideal context for further exploration.

### Interpersonal Displays as Mechanisms of Failure

The present research joins the recent movement to advance social and personality psychology as a study of observable, meaningful behavior (Baumeister, Vohs, & Funder, 2007; Furr, 2009). In the context of an initial interaction, any intrapsychic state can only affect interpersonal outcomes to the extent that it is made manifest in some behavioral display, be it obvious and lasting or subtle and fleeting—our potential partners are not mind-readers. Previous work in the context of speed-dating has suggested that people higher in attachment anxiety are found unappealing by potential partners after an initial interaction (Luo & Zhang, 2009; McClure, Lydon, Baldwin, & Baccus, 2010), but the mechanisms by which attachment anxiety is having its effect are still unknown. What interpersonal behaviors are people high in attachment anxiety displaying to their potential partners to compromise the relational opportunity?

We expect, given the characteristic motivations and cognitions associated with attachment anxiety, and especially the mismatch between their hopes for acceptance and fears of rejection, that people higher in attachment anxiety will have problematic interpersonal displays consistent with a state of social anxiety. More specifically, we expect them to have displays of social disengagement and of manifest anxiety (Schlenker & Leary, 1982). In the social anxiety literature, social disengagement arises in an effort to avoid or minimize the aversive social situation, and to distance the self from expected negative outcomes (Leary, 2010; Schlenker & Leary, 1982). Interestingly, this would be inconsistent with the predictions that one might make based on attachment theory alone, wherein the hyperactivation strategies associated with attachment anxiety would intensify proximity seeking and attempts to connect. Previous research examining how attachment anxiety and similar forms of insecurity affect social engagement or disengagement in initial interactions and relationship initiation contexts is mixed. Overall, findings are more consistent with disengaged and disaffiliative behaviors (e.g., reticence in making contact to set up a date, Eastwick & Finkel, 2008a; low warmth and sociability, Stinson, Cameron, Wood, Gaucher, & Holmes, 2009; inhibition, Vorauer, Cameron, Holmes, & Pearce, 2003) than with engagement (although see Brumbaugh & Fraley, 2010). Moreover, some findings that seem initially consistent with engagement (i.e., heightened self-disclosure, Mikulincer & Nachshon, 1991) reflected a preoccupation with the self and insensitivity to and disengagement from the interaction partner. Displays of social disengagement would not be well received by potential partners because it works against the reciprocity of liking effect (Beckman & Secord, 1959; Miller, 2012) and potential partners do not correct for others' feelings of insecurity when judging their inhibition (Vorauer et al. 2003).

We also predict that more anxiously attached people will overtly manifest their internal state of social anxiety (Schlenker & Leary, 1982). That is, there will be leakage of the internal affective state arising from the motivation–expectancy mismatch. Previous research has linked attachment anxiety to preoccupation, nervousness, and rumination in the face of a relational opportunity, as measured by self-report and cognitive interference (Bartz & Lydon, 2006) and by observer ratings (Brumbaugh & Fraley, 2010). We are not aware of any research linking manifestations of anxiety to negative relationship initiation outcomes per se, but positive affect and attitudes are foundational to interpersonal attraction (Huston & Levinger, 1978; Miller, 2012). Processes such as mood contagion (e.g., Neumann & Strack, 2000) or the overgeneralizing of traits from emotions (e.g., Montepare & Dobish, 2003) would mean that a potential partner perceiving manifest anxiety would neither feel good nor form a positive impression. In the context of their existing relationships, more anxiously attached people might use manifestations of anxiety as suboptimal but successful strategies to engage the attention and care of an inconsistently responsive attachment figure. However, attachment and other theories of relationship development (Altman & Taylor, 1983; Holmes & Rempel, 1989) predict that the display of manifest anxiety is inappropriate and maladaptive in the context of an initial interaction, and should be down-regulated.

We think that it is important to consider each of these two different displays of social anxiety to better understand the particular interpersonal problems that more anxiously attached people

are experiencing. As we have described, although they arise from the same intrapsychic state of social anxiety, the interpersonal processes that link the displays to failure are likely to be different (e.g., “She didn’t seem to want to talk to me; I don’t like her.” versus “She seemed really anxious; that was unappealing.”). Moreover, other situational and dispositional factors may exacerbate or attenuate one display or the other. For example, interacting with a particularly friendly, sociable partner may overcome disengagement, or interacting with a very warm, accepting partner could mitigate anxiety. It is also possible that the hyperactivated connection motive associated with attachment anxiety could enable more anxiously attached people to overcome the impulse to disengage, even though their underlying insecurities might still be overtly displayed (similar to what was found by Brumbaugh & Fraley, 2010). Gaining a better understanding of the varied ways in which the internal state of social anxiety might be externally manifested across different relational opportunities is key to understanding the negative interpersonal consequences that follow.

### The Present Research

We conducted the present research to systematically explore how individual differences in attachment security and insecurity—particularly anxious insecurity—affect behavior and outcomes during the earliest stages of relationship initiation. We proposed and tested a mediational model, illustrated in Figure 1. We expected that more anxiously attached people would experience interpersonal failure when presented with a relational opportunity (the *c* path), and that they would be especially prone to problematic interpersonal displays characteristic of a state of social anxiety (the *a* path), and that these interpersonal displays would contribute to their negative outcomes (the indirect effect, *ab*). Because relational opportunities might be found in any number of situations (e.g., a bar or party, online, at work or school, etc.), we tested the model in a variety of initial interactions: Engaging in speed-dating (Study 1), introducing oneself to an attractive, available member of the preferred sex who is deciding whether or not to interact with you (Study 2), and interacting with a friendly, attractive, available member of the preferred sex while working on a collaborative

laboratory task (Study 3). These three highly impactful contexts allowed us to examine interpersonal outcomes and interpersonal behavior directly without having to rely on retrospective or hypothetical self-reports. Moreover, by using these three very different initial interaction paradigms, we were able to look for converging evidence for our model across contexts. Although we expect to see similar patterns of results across the three contexts, it is nonetheless possible that differences will emerge. We will be open to cautiously discussing these contextual differences, especially as they may suggest future directions for ameliorating the behavior or outcomes of more insecure people.

In each study we also examined the avoidant form of attachment insecurity, although, as described above, we thought it would be less likely to inform behavior and outcomes in these initial interactions. Previous research has shown null and negative effects for attachment avoidance on speed-dating outcomes (Luo & Zhang, 2009; McClure et al., 2010) and mixed effects on interpersonal displays in a relational opportunity context (Brumbaugh & Fraley, 2010). Whether attachment avoidance will affect outcomes in the relational opportunity context, and if so, through what sorts of displays and behaviors, are open questions that we can begin to explore in these studies.

Finally, in Study 3 we sought to complement the more holistic, impressionistic interpersonal displays with a more granular examination of interpersonal behavior with intensive exploratory coding. More specific identification of the behaviors associated with unappealing interpersonal displays would be an initial step toward finding bottom-up avenues for intervention to improve negative relationship initiation outcomes.

### Study 1: Speed-Dating

In the first study, we examined attachment anxiety and relationship initiation using a real-world paradigm: speed-dating. Speed-dating is an event attended by single people who rotate through brief interactions—typically 5 min or less—with each of the other participants (in our studies) of the other sex. At the end of the event, participants indicate to the organizers whether they are interested in pursuing further contact with any of the people they met; if both participants are interested, they have made a “match” and receive each other’s contact information. Speed-dating is an excellent source of data, as it involves numerous systematic dyadic interactions with actual relational consequences (Eastwick & Finkel, 2008b).

We supplemented the basic speed-dating procedure with additional measurements throughout the event that allowed us to look at participants’ interpersonal displays in the speed-dating context, and to relate the displays to actual interpersonal outcomes. We hypothesized that individuals higher in attachment anxiety would have undesirable interpersonal displays, which would lead to more rejection by their speed-dating partners.

Given that physical attractiveness is a powerful filter for initial interpersonal attraction, we wanted to control for “objective” physical attractiveness as a predictor of speed-dating success. However, we also explored the provocative possibility that attachment anxiety might compromise perceptions of attractiveness, even within a 3-min speed date. Although previous research (McClure et al., 2010; Tidwell, Reis, & Shaver, 1996) has not shown an association between physical attractiveness and attachment, these ratings were

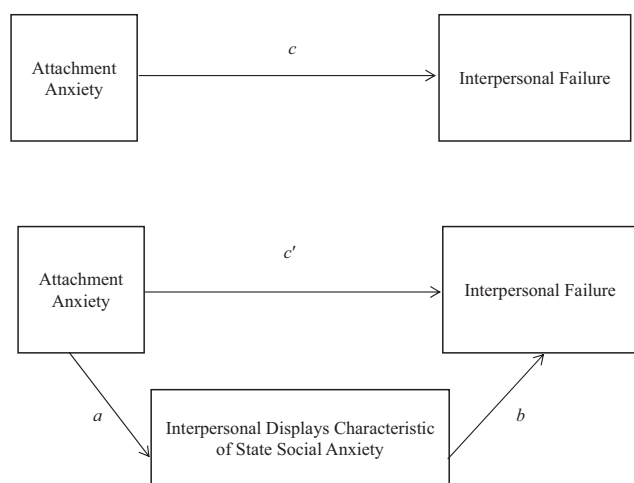


Figure 1. General form of the proposed mediation model.



made by research assistants, for whom the targets' attractiveness had no interpersonal implications. Ratings of attractiveness made by speed-dating partners seem different: If more anxiously attached participants are less popular at speed-dating, we might expect this to be reflected in partner's perceptions of their attractiveness, above and beyond what is perceived by objective raters. We also hypothesize that such biases in speed-dating partners' attractiveness ratings would be due to the unappealing interpersonal displays emitted by more anxiously attached participants during their speed dates.

## Method

**Participants.** We collected data from 74 participants 18–30 years of age (36 female,  $M$  age = 21.2,  $SD$  = 2.55) in two samples.<sup>1</sup> The first sample consisted of 16 males and 16 females, and the second sample consisted of 22 males and 20 females. As compensation, participants received two free movie passes at the end of the speed-dating event, as well as a \$10 gift certificate from Amazon.ca after completing follow-up web-survey questionnaires, which were not part of the present investigation.

**Procedure.** We recruited participants for a genuine speed-dating event to which we added questionnaire and observation components. One week before the event, participants were e-mailed a link to a web-survey to be completed prior to the speed-dating event. This survey included the 36-item Experiences in Close Relationships scale (ECR; Brennan et al., 1998), which consisted of an 18-item subscale for attachment anxiety ( $\alpha$  = .92) and an 18-item subscale for attachment avoidance ( $\alpha$  = .93). The speed-dating event proceeded as follows: As participants arrived and signed in for speed-dating, a group of four (Sample 1) or five (Sample 2) research assistants (RAs) made unobtrusive ratings of participants' attractiveness from 1 to 10 (higher numbers indicate higher attractiveness). Intraclass correlations<sup>2</sup> (ICCs; Shrout & Fleiss, 1979) were .82 for Sample 1 and .78 for Sample 2, indicating moderate to substantial reliability (Shrout, 1998). Participants were given a booklet in which to make ratings of their speed-dating partners. The ratings were made on a 7-point Likert scale, on several dimensions, with the first descriptor at 1 and the second at 7. Participants rated face valid items representing the hypothesized interpersonal displays of social disengagement (*Withdrawn-Friendly*; ICCs for each sample for female partners: .83 and .72 and for male partners: .86 and .70) and manifest anxiety (*Anxious-Relaxed*; ICCs for each sample for female partners: .86 and .87 and for male partners: .81 and .65), and our partner-rated attractiveness outcome (*Unattractive-Attractive*; ICCs for each sample for female partners: .82 and .91 and for male partners: .90 and .94) as well as other ratings not pertinent to the present investigation.<sup>3</sup> Finally, participants checked "yes" or "no" to being put in contact with the person they met.

After receiving an introduction to the speed-dating event and study procedures the actual speed-dating began. Participants were seated at tables in male-female pairs according to their randomly assigned speed-dating number. They had 3-min interactions with each of their speed-dating partners. At the end of each interaction, participants were asked to turn away from each other, and were given approximately 30 s to complete their ratings of their partner, and indicate their interest in further contact with their partner for future dates. Males then rotated to the next table; females remained

seated. Halfway through the event there was a 15-min break. At the end of the event, participants returned their booklets; we tabulated the matches made and e-mailed participants with their matches' contact information.

## Results

**Structure of the data set.** The speed-dating paradigm generates complex multilevel data, which can be conceptualized using an actor-partner interaction framework (Kenny, Kashy, & Cook, 2006): The focal participant, or actor, is the upper level unit, and their speed-dates with each of their potential partners are the lower level units. The data set is constructed such that each actor has a separate row of data for each speed-date (between 16 and 23 rows per participant). Another way to think of this is that a given speed-date, for example, between Tommy and Gina, is represented on two rows of data: One row where Tommy is the actor and Gina the partner, with Tommy's Level 2 data (e.g., his attractiveness, his attachment anxiety) and Gina's ratings of him at Level 1, and one where Gina is the actor and Tommy is the partner, with Gina's Level 2 data and Tommy's ratings of her at Level 1.

**Analysis overview.** Before proceeding with the multilevel mediation analyses, to get a preliminary understanding of the potential relationships between our variables of interest, we examined the zero-order correlations amongst the actor's attachment anxiety and avoidance, the actor's attractiveness as rated by the research assistants, the mean ratings of the displays received by the actor, and the actor's mean speed-dating outcomes (see Table 1). Actors higher in attachment anxiety were seen on average as more manifestly anxious but not more socially disengaged. Attachment anxiety and both displays were associated with less favorable speed-dating outcomes on average. Although the association between attachment anxiety and RA-rated attractiveness was not significant, consistent with previous work (McClure et al., 2010;

<sup>1</sup> These represent two of the four samples reported in McClure et al. (2010), specifically the "recruited" samples. Because we were gaining access to the "found" samples through the auspices of the organization running those speed-dating events, we were not able to administer the additional measures of the interpersonal displays and partner-rated attractiveness in the McClure et al. study. That study examined the popularity and selectivity of the anxiously attached, but did not examine interpersonal displays. Because we are looking at a subsample, the findings reported here are neither a replication of, nor directly comparable to those in the McClure et al. study; conceptually, though, popularity is the average of a participant's "yeses" from their potential partners (i.e., the further contact outcome examined in a multilevel analysis in the present article) and is highly correlated with the partner-rated attractiveness outcome.

<sup>2</sup> Throughout the article, we use ICC(3,  $k$ ), where  $k$  is the number of people (i.e., research assistants, potential partners) making the rating (Shrout & Fleiss, 1979).

<sup>3</sup> In an earlier unreported exploratory study we considered Phony-Genuine as a potential correlate of attachment anxiety but did not find evidence for such a relation. We retained this dimension in subsequent studies but still did not find correlations with attachment anxiety. We also assessed submissiveness because of its potential association with attachment anxiety, but we did not expect submissiveness to be a reliable deterrent to initial interpersonal success (Gilbert, 2001; Simpson, Gangestad, & Biek, 1993). Indeed, although attachment anxiety was associated with submissiveness across the three studies, it did not predict negative outcomes. Given that our interest was in the mechanisms whereby more anxiously attached people were experiencing social failure, and that submissiveness does not predict failure, we do not report on it further in the present manuscript.

Table 1  
Correlations Among Attachment Anxiety, the Average Interpersonal Display Ratings Received by the Actor, and Averaged Speed-Dating Outcomes (Study 1)

Variable	1	2	3	4	5	6	7
1. Attachment anxiety <sup>a</sup>	—						
2. Attachment avoidance <sup>a</sup>	-.23	—					
3. RA-rated attractiveness <sup>a</sup>	-.13	.16	—				
4. Mean social disengagement <sup>b</sup>	.14	-.02	.00	—			
5. Mean manifest anxiety <sup>b</sup>	.25	-.16	-.23	.55	—		
6. Mean further contact <sup>b</sup>	-.29	.17	.72	-.32	-.32	—	
7. Mean partner-rated attractiveness <sup>b</sup>	-.33	.21	.85	-.19	-.44	.85	—

Note.  $N = 74$ . RA = research assistant.

<sup>a</sup> Variables measured at the between-persons level for each actor-participant. The correlation between anxiety and avoidance is significant ( $p < .05$ ), but the correlations between the attachment dimensions and RA-rated attractiveness are not ( $p > .28$  for anxiety and  $p > .19$  for avoidance). <sup>b</sup> Variables measured at the within-persons level of the speed-date and aggregated at for each actor-participant at the between-persons level. Because there were interactions between participants, these aggregates are not independent. Accordingly, we present these correlations for descriptive purposes only, without tests of significance.

Tidwell et al., 1996), and partner-rated attractiveness was highly correlated with RA-rated attractiveness, higher attachment anxiety was associated with lower partner-rated attractiveness.

We hypothesized that a participant's attachment anxiety (a Level 2 variable) would predict their speed-dating outcomes (a Level 1 variable), mediated by their interpersonal displays of social disengagement and manifest anxiety (Level 1 variables). Accordingly, our predictor is at Level 2 and our mediator and outcome are at Level 1 resulting in a 2-1-1 multilevel mediation model (Krull & MacKinnon, 2001; Zhang, Zyphur, & Preacher, 2009). We used SAS 9.3 to conduct the multilevel regressions that form our mediational model.<sup>4</sup>

**Outcomes.** For the first step in building our mediation model we examined the effect of attachment anxiety on the speed-dating outcomes. For the dichotomous further contact outcome, we ran a multilevel logistic regression, with desiring further contact as the reference category (coded as 1; not desiring further contact was coded as 0). For the partner-rated attractiveness outcome we ran a multilevel linear regression.<sup>5</sup> Our primary predictors for both the logistic and linear regression were attachment anxiety, gender (coded as  $-0.5$  for females and  $0.5$  for males), and the two-way interaction. We included attachment avoidance as a covariate; given that we had found a restriction of range in avoidance at speed-dating, such that these speed-dating participants were significantly less avoidant than participants in other social psychology studies (see McClure et al., 2010) we do not present models including interactions with avoidance as their interpretation would be unclear.<sup>6</sup> We also covaried for the ratings of attractiveness made by the research assistant observers and the sample from which participants were drawn. All predictors and covariates were grand mean centered. Finally, we included three random intercepts in the model, one for the actor, one for the partner, and one for the particular speed-date.<sup>7</sup>

The intercept and slope estimates for the fixed effects are presented in Table 2, as are the variances associated with the random effects. Attachment anxiety was negatively associated with both the contact outcome and the partner-perceived attractiveness outcome: Partners were less likely to want to pursue further contact with participants higher in attachment anxiety; a one-unit increase in anxiety nearly halves their chances (the estimate in the logistic regression corresponds to an odds ratio of .51). Also, more anxiously attached indi-

viduals were rated as less attractive by their partners; this effect is above-and-beyond their attractiveness as rated by research assistant observers.

Consistent with the correlation between RA-rated attractiveness and mean partner-rated attractiveness reported in Table 1, speed-dating partners were more interested in dating people who RAs had rated as more attractive. Gender did not significantly predict the contact outcome, but it did predict partner-perceived attractiveness such that, adjusting for observers' ratings of attractiveness, male participants were perceived as less attractive by their partners whereas female participants were perceived as more attractive.

**Interpersonal displays.** Second, we tested the associations between attachment anxiety and the two interpersonal displays. We ran separate regressions for each display. As in the models for the speed-dating outcomes, our primary predictors were attachment anxiety, gender, and the two-way interaction; we again covaried for avoidance, attractiveness, and sample; these were all grand mean centered. We used the same random intercepts as in the models for the speed-dating outcomes.

The results for each model are presented in Table 3. For the display of social disengagement, there were no significant effects. For the display of manifest anxiety, actor's anxiety predicted their partners' perceptions, with more anxious individuals appearing more manifestly anxious, but this effect was qualified by an interaction with gender. Decomposing the interaction showed that the effect of anxiety was stronger and more reliable for males ( $b =$

<sup>4</sup> The SAS code used for the analyses below is available from the authors upon request.

<sup>5</sup> We did not investigate participants' speed-dating matching, as it was tangential to the present question of whether more anxiously attached people are less appealing to their potential partners. In McClure et al. (2010), being unpopular decreased matches for anxiously attached men but was offset by a lack of selectivity in anxious women.

<sup>6</sup> We did examine the interactions between attachment anxiety, avoidance, and gender; none were significant. The main effects of anxiety remained significant in all cases when the avoidance interactions were added to the model.

<sup>7</sup> We also tested all of the models with a mean of the ratings given by the partner instead of the random intercept for the partner; our findings were essentially the same.

.32,  $SE = .11$ , 95% CI [.11, .54]) than for females ( $b = -.02$ ,  $SE = .11$ , 95% CI [-.23, .19]).<sup>8,9</sup> Because we believe the displays of social disengagement and manifest anxiety to be related but distinguishable, we reran the regression for each display including the other display as a covariate. Covarying for social disengagement did not appreciably change the results for manifest anxiety (across both genders:  $b = .15$ ,  $SE = .08$ ,  $p = .06$ ; for males only:  $b = .32$ ,  $SE = .11$ ,  $p < .01$ ); covarying for manifest anxiety did not uncover an effect for social disengagement ( $b = .09$ ,  $SE = .06$ ,  $ns$ ).

**Mediational models.** Based on the above findings showing that attachment anxiety was associated with the speed-dating outcomes of being pursued less often for future dating contact, and being found less attractive by partners, and with the interpersonal display of manifest anxiety, we next sought to test our mediational model connecting attachment to the speed-dating outcomes via this display. We examined the mediation using a regression model with both attachment anxiety and the manifest anxiety display predicting the speed-dating outcome, covarying for gender, attachment avoidance, research-assistant-rated attractiveness, and sample (all grand-mean centered). The effect of attachment anxiety on the speed-dating outcomes was not moderated by gender, but there was evidence of anxiety by gender interactions predicting the display of manifest anxiety. In any case, we did not have sufficient power to effectively test moderated multilevel mediation. Accordingly, we calculated the effect estimates for the mediation models without the gender by anxiety interaction, still covarying for gender, attachment avoidance, research-assistant-rated attractiveness, and sample. We followed up with exploratory analyses for the mediation via manifest anxiety split by gender. Although this splitting does not test moderation by gender directly, and moreover decreases our power to detect the unmoderated indirect effects, we thought it would be informative nonetheless.

As recommended by Zhang et al. (2009, which is an update of Krull & MacKinnon, 2001), we split the mediating display into its between-persons component—that is, the mean rating the actor received on that display, grand-mean centered—and its within-person component—that is, the deviation from the actor's mean for the given speed-date. Because we were interested in what more anxiously attached people were doing consistently wrong in each of their speed-dates, we focused on the between-persons component in our mediation model.<sup>10</sup> We used Selig and Preacher's (2008) online Monte Carlo simulation utility for assessing mediation, with the default 20 thousand repetitions (as recommended by Preacher & Selig, 2010, in the text of their online Monte Carlo simulation utility for 1-1-1 multilevel mediation).<sup>11</sup>

The results of the mediation analyses are presented in Table 4 and Figures 2 and 3. For both outcomes, the indirect effect of attachment anxiety via the display of manifest anxiety was marginal (for the further contact outcome:  $ab = -.11$ ,  $SE = .06$ , simulated 95% CI [-.25, .005]; for the partner-rated attractiveness outcome:  $ab = -.04$ ,  $SE = .02$ , simulated 95% CI [-.09, .002]). Our exploratory gender-split mediations showed that for males, the indirect effect of attachment anxiety on the further contact outcome was significant ( $ab = -.24$ ,  $SE = .12$ , simulated 95% CI [-.52, -.04]); for the partner-rated attractiveness outcome it was marginal ( $ab = -.06$ ,  $SE = .04$ , simulated 95% CI [-.15, .001]). For females the indirect effects were nonsignificant ( $abs < .01$ ).

## Discussion

In this first study, we found support for our hypotheses that more anxiously attached individuals would experience negative outcomes: Attachment anxiety predicted being pursued by fewer potential partners. Moreover, higher levels of attachment anxiety predicted lower attractiveness ratings from potential partners, above-and-beyond assessments of attractiveness made by research assistant observers. We also found partial support for our hypotheses that attachment anxiety would be associated with characteristic interpersonal displays of social disengagement and of manifest anxiety, and that these displays would carry the effect of attachment anxiety to the outcomes: More anxiously attached participants were seen as more manifestly anxious but this was moderated by gender such that the effect of attachment anxiety was stronger and more reliable for males being rated by females than for females being rated by males. Nonetheless, we found marginal mediation via the display of manifest anxiety for both outcomes and significant mediation whereby more anxiously attached men were failing at speed-dating because they appeared more manifestly anxious to their female partners.

Although our relatively small sample size makes us cautious in interpreting null findings conclusively, there are interesting speculative explanations. The null result for the social disengagement display may be attributable to contextual effects or to self-selection. That is, speed-dating is explicitly designed as an opportunity to connect with potential partners, and so the norms of the speed-dating context may dampen social disengagement or the people who attend speed-dating may be those who have overcome social disengagement. As to why we found that attachment anxiety reliably predicted the manifest anxiety display for males but not for females, we believe that the speed-dating context may be

<sup>8</sup> To decompose the interaction, we reran the model once with an uncentered dummy code for female (i.e., female = 1, male = 0) and again with an uncentered dummy code for male (i.e., male = 1, female = 0). The former gives the anxiety slope for males and the latter the anxiety slope for females.

<sup>9</sup> We also examined whether the associations between attachment anxiety and the interpersonal outcomes, and between anxiety and the interpersonal displays could be explained by the Big Five personality factor of neuroticism, which is reliably associated with attachment anxiety (Mikulincer & Shaver, 2007a). We used the Ten-Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003), which includes two items for neuroticism ( $\alpha = .66$ ). Neuroticism did not explain the association between attachment anxiety and speed-dating success for either outcome: When we added neuroticism as a covariate, it did not explain additional variance and attachment anxiety was still significant. We then turned to the interpersonal display that was associated with attachment anxiety, namely, manifest anxiety: Neuroticism was a marginal predictor of manifest anxiety, above and beyond attachment anxiety ( $b = .11$ ,  $p = .053$ ); the interaction between gender and anxiety predicting manifest anxiety remained significant covarying for neuroticism. For males, when both attachment anxiety and neuroticism were included in the same model, both neuroticism and anxiety dropped to trends (anxiety:  $b = .22$ ,  $p = .14$ ; neuroticism:  $b = .16$ ,  $p = .11$ ).

<sup>10</sup> We think that it is entirely plausible to hypothesize that attachment anxiety might also affect the within-person component—for example, that higher attachment anxiety would be associated with higher reactivity and more variable behavior across speed-dates—but that is a question for future research.

<sup>11</sup> Although bootstrapping techniques are recommended (Preacher & Hayes, 2008; Shrout & Bolger, 2002) and are becoming the norm for testing mediation, we are not currently aware of any programs to bootstrap the  $ab$  effect in a 2-1-1 multilevel mediation model.



Table 2  
*Multilevel Regressions Testing Whether Anxiety Predicts the Speed-Dating Outcomes (Study 1)*

Effects	Estimate	SE	<i>t</i> <sup>a</sup>	Z	CI <sub>95</sub>	
					Lower	Upper
Further contact outcome						
Fixed effects (intercept, slopes)						
Intercept	−0.67***	0.18	−3.67		−1.04	−0.31
Attachment anxiety	−0.28*	0.11	−2.43		−0.51	−0.05
Gender	−0.51	0.38	−1.36		−1.27	0.24
Anxiety × Gender	−0.19	0.23	−0.85		−0.65	0.26
Attachment avoidance	0.01	0.12	0.12		−0.22	0.25
RA-rated attractiveness	0.89***	0.11	8.05		0.67	1.11
Sample	−0.66 <sup>†</sup>	0.38	−1.76		−1.41	0.09
Random effects (variances) <sup>b</sup>						
Actor	0.48***	0.16		3.01		
Partner	1.49**	0.36		4.19		
Speed-date	0.12	0.18		0.69		
Partner-rated attractiveness outcome						
Fixed effects (intercept, slopes)						
Intercept	4.61***	0.08	56.39		4.45	4.78
Attachment anxiety	−0.19***	0.05	−3.86		−0.28	−0.09
Gender	−0.39*	0.17	−2.35		−0.73	−0.06
Anxiety × Gender	−0.12	0.10	−1.27		−0.31	0.07
Attachment avoidance	−0.01	0.05	−0.12		−0.10	0.09
RA-rated attractiveness	0.57***	0.04	13.07		0.49	0.66
Sample	−0.11	0.17	−0.69		−0.45	0.22
Random effects (variances)						
Actor	0.10	0.03		3.75		
Partner	0.32	0.06		5.11		
Speed-date	0.11	0.04		2.99		
Residual	0.82	0.05		17.39		

Note. CI<sub>95</sub> = 95% confidence interval; RA = research assistant.

<sup>a</sup> *df* = 67. Degrees of freedom were calculated using the number of independent units (i.e., the actor-participants) and the number of between-person explanatory variables (Bolger & Laurenceau, 2013). <sup>b</sup> For logistic regression, the value for the residual is assumed to be 1 (Agresti, 2007).

† *p* < .10. \* *p* < .05. \*\* *p* < .01. \*\*\* *p* < .001.

obscuring the signal of attachment anxiety for female actors. Although both genders must navigate the dual challenges of presenting themselves well and of evaluating the presentation of potential partners, in the context of speed-dating, men may be slightly more focused on the former and women on the latter. Men tend to be less selective at speed-dating (e.g., McClure et al., 2010). Part of this may be attributable to an artifact of the traditional speed-dating paradigm (Finkel & Eastwick, 2009): More selective norms and cognitions are activated by being in the role of the person being approached (i.e., the females who remain seated) as compared to the person doing the approaching (i.e., the males who rotate from partner to partner). This also could be attributed to different evolutionary pressures acting to make women relatively more selective than men (Buss & Schmitt, 1993). As a result, male partners may be less attentive to the signal of anxiety in female actors than would be female partners in male actors, because the males may be more preoccupied with their own self-presentation while females would be more preoccupied with evaluating potential partners. It is important to note, though, that male partners did not appear to be completely inattentive to attachment anxiety—both males and females were less attracted to and less interested in pursuing further contact with more anxiously attached participants, and the interactions between attachment anxiety and gender were not significant for these outcomes. In

sum, we found links between attachment anxiety and the speed-dating, and between attachment anxiety and the display of manifest anxiety; in the next studies looked to replicate these results and provide clearer findings for the mediation model as a whole.

## Study 2: Video Introductions

For our second study we approached the question of how attachment anxiety affects self-presentation during a relational opportunity from a different direction, that is, using a controlled laboratory paradigm. Single, heterosexual participants filmed brief videos introducing themselves. To ensure the activation of the more anxiously attached participants' chronic relational insecurities, participants were told that another attractive, single peer of the preferred sex would ostensibly be deciding whether to have a face-to-face interaction based on their introduction. This paradigm may appear lower in ecological validity relative to speed-dating, but we believed it to have a real-world analogue in online dating, wherein one develops a static profile of the self to present to prospective partners. This paradigm allowed us to maintain a high level of psychological impact while strictly controlling any potential interpersonal variability (i.e., partner and interaction effects) so as to maximize the influence of intrapersonal forces, such as attachment anxiety. We hypothesized that the participants high in



Table 3  
*Multilevel Regressions Testing Whether Attachment Anxiety Predicts Each of the Interpersonal Displays (Study 1)*

Effects	Estimate	SE	<i>t</i> <sup>a</sup>	Z	CI <sub>95</sub>	
					Lower	Upper
Display of social disengagement						
Fixed effects (intercept, slopes)						
Intercept	5.51***	0.10	56.91		5.31	5.70
Attachment anxiety	0.09	0.06	1.42		−0.03	0.21
Gender	−0.22	0.20	−1.11		−0.62	0.18
Anxiety × Gender	0.11	0.12	0.90		−0.13	0.35
Attachment avoidance	0.01	0.06	0.16		−0.11	0.13
RA-rated attractiveness	−0.04	0.06	−0.69		−0.15	0.07
Sample	0.04	0.20	0.21		−0.35	0.44
Random effects (variances)						
Actor	0.18***	0.04		4.13		
Partner	0.43***	0.08		5.13		
Speed-date	0.04	0.05		0.84		
Residual	1.19***	0.07		17.46		
Display of manifest anxiety						
Fixed effects (intercept, slopes)						
Intercept	5.12***	0.11	46.20		4.90	5.34
Attachment anxiety	0.15 <sup>†</sup>	0.08	1.98		0.00	0.30
Gender	0.07	0.23	0.31		−0.39	0.54
Anxiety × Gender	0.35*	0.15	2.29		0.04	0.65
Attachment avoidance	−0.01	0.08	−0.10		−0.16	0.15
RA-rated attractiveness	−0.11	0.07	−1.55		−0.25	0.03
Sample	0.13	0.23	0.57		−0.32	0.58
Random effects (variances)						
Actor	0.30***	0.07		4.45		
Partner	0.49***	0.10		5.06		
Speed-date	0.09 <sup>†</sup>	0.06		1.51		
Residual	1.44***	0.08		17.41		

Note. CI<sub>95</sub> = 95% confidence interval; RA = research assistant.

<sup>a</sup> *df* = 67. Degrees of freedom were calculated using the number of independent units (i.e., the actor-participants) and the number of between-person explanatory variables (Bolger & Laurenceau, 2013).

<sup>†</sup> *p* < .10. \* *p* < .05. \*\*\* *p* < .001.

attachment anxiety would again be disliked based on their introductions, and that this would be due to interpersonal displays of social disengagement and manifest anxiety.

## Method

**Participants.** Ninety-two single, heterosexual participants (41 female), ages 18–26 years (*M* age = 20.3, *SD* = 1.92) were recruited from the university's Social Psychology Paid Participants Pool for a 1-hr study about how people introduce themselves and get to know each other. Participants had already completed a recruitment web-survey, which included a premeasure of their attachment anxiety and attachment avoidance (the ECR; Brennan et al., 1998). We sought to recruit approximately equal numbers of participants high and low in anxiety based on this premeasure. Participants received \$10 as compensation for their time. Seven participants were dropped due to suspicion, leaving 85 participants in the analyses.

### Procedure.

**Video collection.** Upon arrival, the experimenter brought the participant into the testing room, seating them at a desk. On the opposite side of the room were a computer, a digital camera, and a digital camcorder. The experimenter introduced the study to the

participant as an investigation of how people introduce themselves and get to know each other in situations where differing amounts of information are available with which to form a first impression. The experimenter told the participant that they were one of a pair, and that the other participant ("Julie" for male participants or "Eric" for female participants) was sequestered in another room, having been asked to arrive at an earlier time to ensure that the two did not meet. In reality there was no second participant.

The experimenter explained that there were two conditions in the study: A photograph condition and a video condition. The participant was told that their partner had been randomly assigned to the photograph condition, while they had been randomly assigned to the video condition. The participant would receive a photograph of their partner, while their partner would receive a video introduction from them. Their partner would be watching the video and then deciding whether they would like to have a face-to-face interaction with the participant. After asking if the participant understood how the study worked, the experimenter obtained the participant's informed consent. The participant then received an initial questionnaire package, which concluded with the ECR measure of attachment ( $\alpha$  = .91 for anxiety and  $\alpha$  = .94 for avoidance). As the participant began the questionnaires, the ex-

Table 4  
*Multilevel Regressions for the Mediation Analyses Connecting Attachment Anxiety to the Speed-Dating Outcomes via the Manifest Anxiety Display*

Effects	Estimate	SE	<i>t</i> <sup>a</sup>	Z	CI <sub>95</sub>	
					Lower	Upper
Further contact outcome						
Fixed effects (intercept, slopes)						
Intercept	−0.75 <sup>***</sup>	0.19	−3.91		−1.14	−0.37
Manifest anxiety (between)	−0.71 <sup>***</sup>	0.17	−4.14		−1.05	−0.37
Manifest anxiety (within)	−0.44 <sup>***</sup>	0.07	−6.63		−0.57	−0.30
Attachment anxiety	−0.21 <sup>†</sup>	0.11	−1.90		−0.42	0.01
Attachment avoidance	0.00	0.11	0.01		−0.22	0.22
Gender	−0.52	0.39	−1.32		−1.31	0.26
Objective attractiveness	0.87 <sup>***</sup>	0.11	8.22		0.66	1.08
Sample	−0.59	0.40	−1.50		−1.38	0.19
Random effects (variances) <sup>b</sup>						
Actor	0.36 <sup>*</sup>	0.14		2.53		
Partner	1.87 <sup>***</sup>	0.44		4.27		
Speed-date	0.12	0.19		0.62		
Partner-rated attractiveness outcome						
Fixed effects (intercept, slopes)						
Intercept	4.60 <sup>***</sup>	0.08	59.96		4.45	4.76
Manifest anxiety (between)	−0.24 <sup>**</sup>	0.07	−3.36		−0.38	−0.10
Manifest anxiety (within)	−0.19 <sup>***</sup>	0.02	−9.14		−0.23	−0.15
Attachment anxiety	−0.15 <sup>**</sup>	0.05	−3.22		−0.24	−0.06
Attachment avoidance	0.00	0.05	−0.07		−0.09	0.09
Gender	−0.37 <sup>*</sup>	0.16	−2.36		−0.69	−0.06
Objective attractiveness	0.55 <sup>***</sup>	0.04	13.07		0.47	0.63
Sample	−0.09	0.16	−0.56		−0.40	0.23
Random effects (variances)						
Actor	0.09 <sup>***</sup>	0.02		3.66		
Partner	0.29 <sup>***</sup>	0.06		5.07		
Speed-date	0.10 <sup>**</sup>	0.04		2.89		
Residual	0.77 <sup>***</sup>	0.04		17.36		

Note. CI<sub>95</sub> = 95% confidence interval.

<sup>a</sup> *df* = 67. Degrees of freedom were calculated using the number of independent units (i.e., the actor-participants) and the number of between-person explanatory variables (Bolger & Laurenceau, 2013). <sup>b</sup> For logistic regression, the value for the residual is assumed to be 1 (Agresti, 2007).

<sup>†</sup> *p* < .10. \* *p* < .05. \*\* *p* < .01. \*\*\* *p* < .001.

perimeter took the digital camera and said that they were going to the other room to take the photograph of the partner.

After a delay, the experimenter returned and ostensibly uploaded the photograph to the computer while the participant completed their questionnaires. Once the participant had finished, the experimenter brought them to the computer to view the photograph, which showed a preferred-sex other rated as attractive in pilot testing. The experimenter also gave the participant a demo-

graphics sheet, which indicated that the partner was single. Participants completed additional measures including their impression of the partner while the experimenter prepared the digital camcorder.<sup>12</sup>

Before filming, the experimenter reminded the participant of the supposed rest of the procedure: Their partner would be choosing whether to have a face-to-face meeting after watching the video. The experimenter gave the participant a moment to prepare, and then when the participant indicated they were ready, recorded their introduction. Participants were free to take as much or as little time as they wanted; videos were on average 36 s long (*SD* = 19 s).

The experimenter then unplugged the camera and said that they would take it into the other room to show the partner, and gave the participants some additional questionnaires. After a 5-min delay, the experimenter returned and explained that the study was over,

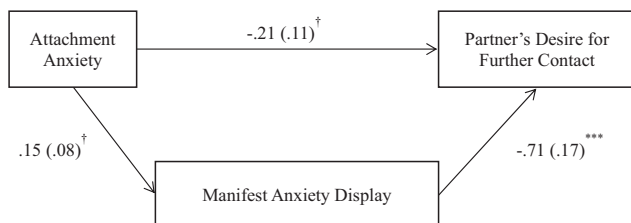


Figure 2. Mediation model linking attachment anxiety to the partner's desire for further contact via manifest anxiety (Study 1). Standard errors in parentheses. <sup>†</sup> *p* < .10. \*\*\* *p* < .001.

<sup>12</sup> Participants' ratings of how appealing they found the confederate were not associated with their attachment anxiety, their own likeability outcome, or their displays of disengagement or anxiety. The ratings of confederate appeal did not interact with attachment anxiety in predicting the interpersonal appeal outcome or the displays.

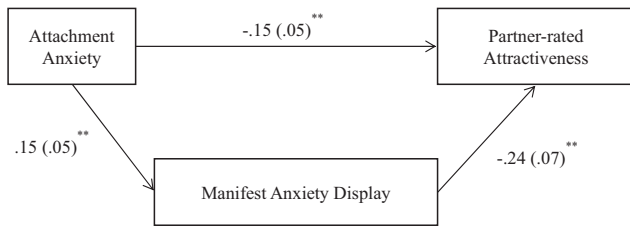


Figure 3. Mediation model linking attachment anxiety to partner-rated attractiveness via manifest anxiety (Study 1). Standard errors in parentheses. \*\*  $p < .01$ .

conducted a funneled suspicion probe and debriefing, and confirmed participants' consent to use their video.

**Video ratings.** After data collection, eight undergraduate volunteers rated the videos for 31 descriptors, listed alphabetically, on a 9-point Likert scale. We generated the list of descriptors based on similar measures from Wiggins (1979) and from Simpson et al. (1993). We then combined these descriptors to form several composite variables, including the variables of interest (see Appendix A): An *interpersonal appeal* outcome ( $ICC = .71$ ) and the interpersonal displays of *social disengagement* ( $ICC = .85$ ) and *manifest anxiety* ( $ICC = .79$ ). ICCs indicated moderate to substantial reliability (Shrout, 1998).

## Results

**Interpersonal appeal outcome.** We first examined whether attachment anxiety compromised the impression presented in the introduction. We conducted a hierarchical linear regression of the interpersonal appeal composite onto attachment anxiety, attachment avoidance, and gender in the first step, the two-way interactions in the second step, and the three-way interactions in the third step, having mean-centered anxiety, avoidance, and gender (with females coded as  $-0.5$  and males coded as  $0.5$ ). Only the first step was significant ( $R^2 = .26$ ,  $F = 9.63$ ,  $p < .01$ ;  $R^2$  change for subsequent steps  $< .01$ ). The results of this first step are presented in Table 5. Attachment anxiety decreased interpersonal appeal. There was also a main effect of gender showing that women were rated as less appealing than men. Neither avoidance in this first step, nor any of the interactions in subsequent steps were significant. The attachment anxiety by gender interaction in particular was estimated as  $b = -.13$ ,  $SE = .14$ ,  $t(79) = -.39$ ,  $p = .36$ .

Table 5  
Regression Testing Whether Attachment Anxiety Predicts the Interpersonal Appeal Outcome (Study 2)

Predictors	<i>B</i>	<i>SE</i>	<i>t</i> <sup>a</sup>	<i>CI</i> <sub>95</sub>	
				Lower	Upper
Intercept	5.61**	0.07	82.57	5.47	5.74
Attachment anxiety	−0.15*	0.07	−2.19	−0.29	−0.01
Attachment avoidance	−0.10	0.07	−1.46	−0.23	0.04
Gender	−0.69**	0.14	−4.96	−0.97	−0.42

Note. *CI*<sub>95</sub> = 95% confidence interval.

<sup>a</sup>  $df = 81$ .

\*  $p < .05$ . \*\*  $p < .01$ .

**Interpersonal displays.** We next examined whether attachment anxiety predicted the interpersonal displays of social disengagement and manifest anxiety. Both displays were correlated with attachment anxiety: More anxiously attached individuals were more disengaged,  $r(83) = .31$ ,  $p < .01$ , and anxious,  $r(83) = .37$ ,  $p < .01$ . We conducted linear regressions of each display composite onto attachment anxiety, attachment avoidance, and gender in the first step, the two-way interactions in the second step, and the three-way interaction in the third step. Again, only the first step of these regressions was significant ( $R^2$ s  $> .14$ ,  $F$ s = 4.33,  $ps < .01$ ;  $R^2$  change for subsequent steps  $< .03$ ; see Table 6). More anxiously attached individuals appeared more socially disengaged and more manifestly anxious. Males appeared more socially disengaged than females, but gender did not predict display of manifest anxiety. Neither avoidance nor any of the interactions were significant. The attachment anxiety by gender interactions in particular were estimated as  $bs < -.19$ ,  $SEs > .19$ ,  $ts < 1.01$ ,  $ps > .32$ .

Although we expected the displays to be related but distinguishable, they were much more highly correlated than in Study 1,  $r(83) = .71$ ,  $p < .01$ . We nonetheless examined the unique associations between attachment anxiety and each display. Running the regression models described above, we found that covarying for manifest anxiety rendered the association between attachment anxiety and the display of social disengagement nonsignificant ( $b = .06$ ,  $SE = .07$ ,  $ns$ ); covarying for social disengagement reduced the association between attachment anxiety and the display of manifest anxiety ( $b = .13$ ,  $SE = .07$ ,  $p = .07$ ).

We then examined whether the displays themselves predicted interpersonal appeal, and found significant correlations for social disengagement,  $r(83) = -.74$ ,  $p < .01$ , and manifest anxiety,  $r(83) = -.47$ ,  $p < .01$ . Additional regression analyses did not show any significant interactions between the displays and gender in predicting liking. We also examined whether either display uniquely predicted interpersonal appeal using partial correlations. Adjusting for the display of manifest anxiety, the display of social disengagement was still associated with decreased appeal,  $sr(82) = -.65$ ,  $p < .01$ . However, when we adjusted for the display of

Table 6  
Regression Testing Whether Attachment Anxiety Predicts Each of the Interpersonal Displays (Study 2)

Predictors for each display	<i>B</i>	<i>SE</i>	<i>t</i> <sup>a</sup>	CI <sub>95</sub>	
				Lower	Upper
Social disengagement					
Intercept	5.59**	0.09	62.97	5.41	5.76
Attachment anxiety	0.30**	0.09	−3.18	−0.47	−0.11
Attachment avoidance	0.11	0.09	−1.31	−0.29	0.06
Gender	0.53*	0.18	−2.90	−0.89	−0.17
Manifest anxiety					
Intercept	4.09**	0.09	45.42	3.91	4.27
Attachment anxiety	0.33**	0.09	3.60	0.15	0.52
Attachment avoidance	0.09	0.09	1.00	−0.09	0.26
Gender	0.08	0.19	0.45	−0.29	0.45

Note. *CI*<sub>95</sub> = 95% confidence interval.

<sup>a</sup>  $df = 81$ .

\*  $p < .05$ . \*\*  $p < .01$ .

social disengagement the association between manifest anxiety and appeal was rendered nonsignificant, and even began to reverse direction,  $sr(82) = .11, p = .30$ .<sup>13</sup>

**Test of mediation models.** Next, we tested whether the interpersonal displays of social disengagement and manifest anxiety were mediating the negative relationship between attachment anxiety and the interpersonal appeal outcome in a multiple mediation model. We used the bootstrapping technique recommended by Shrout and Bolger (2002; see also Preacher & Hayes, 2008). To run the analysis, we used the Preacher and Hayes (2008) SPSS macro, with 5,000 resamples. We included both attachment avoidance and gender as covariates. The various direct and indirect effects are presented in Figure 4. The indirect effect via the display of social disengagement was significant ( $b = -.16, SE = .05, p < .01$ ); the indirect effect via the display of manifest anxiety was not ( $b < .01, SE = .03, ns$ ). These indirect effects were significantly different from each other ( $b = -.16, SE = .07, p < .01$ ). Thus, it appears that the negative effect of attachment anxiety on interpersonal appeal was carried by the display of social disengagement.

## Discussion

The findings of this second study supported our hypotheses, replicating and extending many of the findings from Study 1. First, we found that increased attachment anxiety was associated with lower interpersonal appeal. Second, more anxiously attached individuals showed both of the interpersonal displays that we had hypothesized based on our integration of attachment theory and the self-presentational model of social anxiety: Increased attachment anxiety was associated with displays of social disengagement and of manifest anxiety. This association between attachment anxiety and social disengagement, which we thought might have been obscured by the speed-dating context, is of particular note. Third, we again showed a link between displays of social disengagement and manifest anxiety and a negative interpersonal outcome. Finally, problematic interpersonal displays were a mechanism by which more anxiously attached participants were failing. Although in separate tests, each display mediated the link between attachment anxiety and interpersonal outcome ( $ps < .05$ ), the multiple mediational model revealed that social disengagement was stronger

and sufficient in mediating the relationship between anxiety and decreased likeability. Unlike in Study 1, none of these effects were qualified by significant gender interactions. Moreover, these effects occurred in half a minute—an even shorter time frame than speed-dating.

## Study 3: Confederate Interaction

We sought to combine the unique strengths of the first two studies into a new paradigm that incorporated both the real-time face-to-face dyadic interaction of Study 1 and the experimental control of Study 2. Accordingly, we engineered lab sessions wherein participants were presented with a relational opportunity in the form of a semistructured interaction with an attractive, friendly, ostensibly available member of the preferred sex. We employed trained confederates for the interactions, and research assistants reviewed videotapes to rate the outcomes and displays as in Study 2. Moreover, we conducted exploratory coding to identify potential behavioral mechanisms contributing to social failure.

This new paradigm afforded us two major advantages over both speed-dating and the videotaped introductions. First, we were able to increase the length of the interaction compared to Studies 1 and 2. Increasing the length of the initial interaction provides us with a larger sample of participants' relationship initiation behaviors, which will improve measurement (although people do form surprisingly accurate perceptions of others from "thin slices" of behavior; cf. Ambady, Bernieri, & Richeson, 2000). Having a larger sample of behavior may be especially helpful in distinguishing between the display of social disengagement and the display of manifest anxiety as it may allow observers to distinguish specific nuances that were not apparent in thinner slices of behavior. Moreover, in a longer initial interaction, especially one in which the potential partner is friendly, individuals high in attachment anxiety may have the opportunity to down-regulate their state of social anxiety, thereby gradually engaging with the partner and manifesting less anxiety.

Second, we were able to present participants with a partner who would not be concerned with their own relationship initiation outcomes—namely, a trained confederate. We were especially interested in presenting participants with a relatively less evaluative, less threatening interpersonal situation than in the previous studies, to see if more anxiously attached participants would manifest unappealing interpersonal displays even when circumstances were relatively favorable. Accordingly, our confederates were not

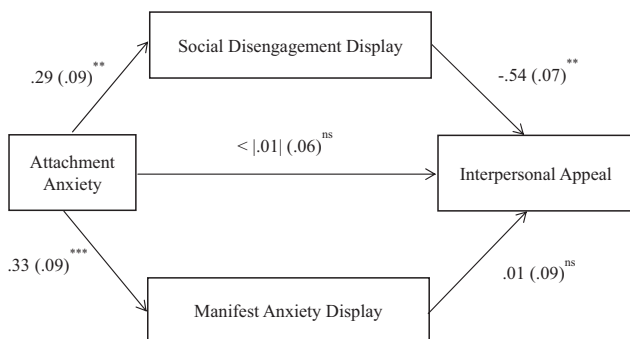


Figure 4. Multiple mediation model linking attachment anxiety to the interpersonal appeal outcome via manifest anxiety and social disengagement (Study 2). Standard errors in parentheses. \*\*  $p < .01$ . \*\*\*  $p < .001$ .

<sup>13</sup> We again tested whether neuroticism was an alternative explanation for our results. Neuroticism was measured using six items from Costa and McCrae's (1985) five-factor personality scale ( $\alpha = .84$ ). Attachment anxiety and neuroticism were indeed correlated,  $r(83) = .49, p < .01$ . Neuroticism was not significantly correlated with the interpersonal appeal outcome,  $r(83) = -.17, p = .12$ ; when added as a covariate it did not significantly predict the outcome above and beyond the effect of attachment anxiety ( $b = -.10, p = .46$ ), although it reduced the effect of anxiety ( $b = -.12, p = .14$ ). Neuroticism was significantly correlated with each of the displays. We then tested the regression models for each of the displays including neuroticism as a covariate. For the social disengagement display, neuroticism was not significant ( $b = .24, p = .19$ ) and anxiety remained significant ( $b = .22, p = .04$ ). For the manifest anxiety display, both anxiety and neuroticism were significant (for anxiety:  $b = .21, p < .05$ ; for neuroticism:  $b = .40, p = .03$ ).



merely attractive; they were also selected and trained to be warm and friendly. However, previous research by Baldwin and Kay (2003) using a social cognitive paradigm found that the chronic rejection sensitivity (Downey & Feldman, 1996; Mikulincer & Shaver, 2003) associated with attachment anxiety is resistant to priming with acceptance cues. Therefore, we expected that even in this longer, lower threat interaction, more anxiously attached participants would continue to have negative social outcomes and unappealing interpersonal displays, and we expected that these displays would mediate the relationship between attachment anxiety and failure.

## Method

**Participants.** We recruited single, heterosexual participants from paid and extra-credit participant pools to participate in a 1-hr lab session for \$10, a movie pass, or course credit. Participants completed attachment premeasures so we could recruit approximately equal numbers of participants in each of the four quadrants represented by the dimensions of anxiety and avoidance and to ensure neither anxiety nor avoidance were confounded with gender or the identity of the confederate.

There were 110 participants in total, however 9 were excluded due to technical problems, and 15 were excluded due to suspicion about the confederate or why the confederate did not return at the end of the study. The analyses were conducted on the remaining 86 participants (49 female), ages 18–27 years ( $M$  age = 19.3,  $SD$  = 1.59). There were no significant differences in attachment between these participants and those who were excluded.

### Procedure.

**Video collection.** Participants came into a lab furnished like a living room and interacted with another participant—in fact an attractive, friendly, ostensibly single, preferred-sex confederate—for approximately 40 min. The interaction was filmed with their knowledge and consent. Confederates were hired based on their attractiveness and interpersonal skills and attended several training sessions. Although they did not have a detailed script for the interaction, the confederates were instructed to be interpersonally warm and told that their goal was for the participant to have a positive interaction with them. They were instructed to greet the participant in a warm manner at the beginning of the interaction. The confederates were instructed not to appear too assertive or too familiar with the study procedures and materials; their instructions included asking the experimenter a scripted question to clarify the procedure of the laboratory task and they were told to first ask the participant how he or she wanted to proceed then suggest sharing or turn-taking as appropriate.

At the beginning of the session, the experimenter verbally collected demographic information, allowing participants to hear that the confederate was ostensibly single. After receiving the introduction to the study—that the researchers were investigating how people might together form an impression of a third party—the participant and confederate sat quietly and independently completed several questionnaires. These included a 29-item version of the ECR (modified from Brennan et al., 1998, by N. L. Collins, personal communication, April 21, 2005), consisting of 14 items measuring attachment anxiety ( $\alpha$  = .93) and 15 items measuring attachment avoidance ( $\alpha$  = .88), each rated from 1 (*disagree strongly*) to 7 (*agree strongly*).

Next, the confederate and the participant were asked to select three interview clips from a list of nine recordings of television interview programs. After this discussion, they provided their choices to the experimenter and began watching the interviews. After each clip, they discussed and came to a consensus about their impression of the interviewee on a provided form. To create a realistic, engaging, generally positive interaction, for the first and third clips the confederate was instructed to select ratings towards the mid-point of the scale, and move towards agreement with the participant and to engage in friendly disagreement and persuasion for the second clip.

Upon completion, they notified the experimenter, who explained that they would next be asked to provide their impressions of each other and that they would be taken to separate rooms to do so. The confederate was instructed to react in a natural but positive way, looking over at the participant and smiling nervously to acknowledge the awkwardness of the situation, but not reorienting away from the participant on the couch. The participant and confederate were left alone briefly before the confederate was led away. The participant completed their ratings of the confederate. When they finished, the experimenter turned the camera off and conducted a funneled probe for suspicion, then sensitively debriefed and compensated the participant.

**Ratings of impressions and interpersonal displays.** Three male and three female peer research assistants rated the interaction videos for each of the participants of the other sex. The interaction was rated in segments and as a whole; we focus on the earliest part of the interaction here, approximately 10 min in duration, up to the point when the participant and confederate had discussed and selected which celebrity interviews to watch.<sup>14</sup>

**Interpersonal appeal outcome.** In this study we constructed a more complex interpersonal appeal outcome, made up of two components:

1. *Impression ratings.* The research assistants made ratings of the participants on a set of 2 social impressions (*How much would you like to be friends with/date the participant?*) on a 9-point Likert scale, from *not at all* (1) to *very much* (9). ICCs for the average impression ranged from .65 to .70.
2. *Attractiveness.* Before watching any of the interaction, research assistants rated participants' attractiveness at baseline using a freeze-frame from the beginning of the video. They made this rating on a double-anchored scale from *unattractive* (1) to *attractive* (10; ICC = .71 for female RAs and .77 for male RAs). They also rated attractiveness after watching the first minutes of the interaction, using a single item on a double-anchored scale from *unattractive* (1) to *attractive* (7; ICC = .74 for

<sup>14</sup> The RAs additional ratings included single-item ratings of the displays for each of the consensus rating discussions, as well as a set of ratings considering the interaction as a whole using the same items described here. As might be expected, the single-item ratings were lower in reliability than the ratings presented here, but they nonetheless showed the same pattern of results. The ratings considering the whole interaction were of comparable reliability to the ratings presented here and again, the pattern of results linking attachment anxiety to negative impressions via manifest anxiety were the same. More details about these ratings and results are available upon request.

female RAs and .81 for male RAs). We created a mean for each rating by averaging across RAs. The ratings were highly intercorrelated,  $r(84) = .88$ . At baseline, the attractiveness rating is uninformed by the interaction; this is analogous to the research-assistant-rated attractiveness in Study 1. By contrast, during the first minutes the attractiveness rating is potentially informed by the participant's behavior; this rating is analogous to the partner-rated attractiveness in Study 1. Accordingly, for the analyses below these attractiveness rating from the first minutes is included in the interpersonal appeal outcome, while the baseline attractiveness rating is included as a covariate.

The impression ratings and the attractiveness ratings at baseline and after the first minutes were highly intercorrelated ( $r_s > .63$ ). We standardized the impression ratings and the attractiveness ratings after the first minutes and averaged them to create an *interpersonal appeal* outcome. The interrater reliability of the interpersonal appeal outcome was moderate (Shrout, 1998; ICC = .78 for female raters and .76 for male raters).

**Interpersonal displays.** Research assistants rated participants' interpersonal displays of social disengagement (ICC = .76 for female RAs and .80 for male RAs) and manifest anxiety (ICC = .65 for female RAs and .67 for male RAs) using the same descriptive adjectives as in Study 2 (see Appendix A).

## Results

**Overview.** Below, we begin with regression analyses for the interpersonal appeal outcome, and then for the interpersonal displays, and concluding with the mediation model. Gender is coded  $-0.5$  for females and  $0.5$  for males; all predictors and covariates are mean-centered. Finally, having examined our models linking attachment anxiety to decreased interpersonal appeal via the interpersonal displays—paralleling the analyses for Studies 1 and 2—we went a step further, with exploratory coding and analyses examining potential behavioral mechanisms linking attachment anxiety to unappealing interpersonal displays and negative outcomes.

**Interpersonal appeal.** As in Study 2, we conducted a hierarchical linear regression of the interpersonal appeal outcome onto attachment anxiety, attachment avoidance, and gender in the first step, the two-way interactions in the second step, and the three-way interaction in the third step. Differently from Study 2, we added baseline attractiveness as a covariate in step 1. Note that baseline physical attractiveness was not associated with attachment anxiety,  $r(84) = -.07$ , *ns*, consistent with Study 1 and with Tidwell et al. (1996). Only the first step of this regression was significant ( $R^2 = .65$ ,  $F = 36.9$ ,  $p < .01$ ;  $R^2$  change for subsequent steps  $< .02$ ,  $ps > .09$ ). The results for this step are presented in Table 7. More anxiously attached participants were less appealing. Also, men elicited more positive impressions than women did. Note that these effects were above and beyond baseline physical attractiveness at Time 1, which was itself strongly predictive of interpersonal appeal. There was no main effect of avoidance, and there were no significant interactions.<sup>15</sup>

**Interpersonal displays.** We then examined the interpersonal displays of social disengagement and manifest anxiety. We conducted a hierarchical linear regression of each display onto attachment anx-

Table 7

*Regression Testing Whether Attachment Anxiety Predicts the Interpersonal Appeal Outcome (Study 3)*

Predictors	<i>B</i>	<i>SE</i>	<i>t</i> <sup>a</sup>	CI <sub>95</sub>	
				Lower	Upper
Intercept	0.03	0.05	0.57	-0.07	0.12
Attachment anxiety	-0.08*	0.04	-2.03	-0.17	0.00
Attachment avoidance	-0.05	0.05	-0.93	-0.16	0.06
Gender	0.87***	0.13	6.92	0.62	1.12
Baseline Attractiveness	0.45***	0.04	11.43	0.37	0.53

Note. CI<sub>95</sub> = 95% confidence interval.

<sup>a</sup> *df* = 81.

\*  $p < .05$ . \*\*\*  $p < .001$ .

iety, attachment avoidance, and gender in the first step, the three two-way interactions in the second step and the three-way interaction in the third step. For social disengagement, there were no significant effects for any step in the model. For manifest anxiety, only the first step was significant ( $R^2 = .10$ ,  $F = 2.94$ ,  $p < .05$ ;  $R^2$  change for subsequent steps  $< .01$ ,  $ps > .83$ ). More anxiously attached participants displayed more anxiety; there were no effects of avoidance or gender. The results of this step are presented in the top of Table 8.

As before, we expected the displays to be related but distinguishable. They were indeed correlated,  $r(84) = .54$ ,  $p < .01$ , but at a level comparable to Study 1 rather than the problematically high correlation of Study 2. Accordingly, we examined whether attachment anxiety would predict the display of manifest anxiety above and beyond the display of social disengagement by adding disengagement as a covariate to the first step of the model described above. Covarying for disengagement did not appreciably change the association between attachment anxiety and the display of manifest anxiety ( $b = .16$ ,  $SE = .06$ ,  $p < .01$ ).

We next examined whether the displays were predicting the interpersonal appeal outcome. Manifest anxiety compromised interpersonal appeal,  $r(84) = -.41$ ,  $p < .01$ . Social disengagement was also negatively associated with interpersonal appeal,  $r(84) = -.47$ ,  $p < .01$ , but, as described above, in this study it was not reliably associated with attachment anxiety and therefore is not a candidate for mediation.

**Tests of mediation.** We accordingly proceeded to test whether the display of manifest anxiety mediated the relationship between attachment anxiety and the interpersonal appeal outcome. We again used the Preacher and Hayes (2008) SPSS bootstrapping macro, with 5,000 resamples, and covaried for gender, avoidance, and baseline attractiveness. The display of manifest anxiety mediated the relationship between attachment anxiety and interpersonal appeal, with an indirect effect estimate of  $-.06$ ,  $SE = .03$ , 95% CI  $[-.11, -.01]$ . The model, with the estimates and standard errors of the direct effects, is presented in Figure 5. Within the first minutes of the interaction, more

<sup>15</sup> There was a marginal anxiety by avoidance interaction ( $b = .49$ ,  $p = .06$ ) and a marginal anxiety by avoidance by gender interaction ( $b = .40$ ,  $p = .09$ ). We also tested models including potential interactions with Time 1 attractiveness and did not find evidence of moderation by baseline attractiveness.

anxiously attached individuals appeared unappealing as a result of appearing manifestly anxious.<sup>16</sup>

**Exploratory coding of behavioral mechanisms.** We conducted follow-up exploratory coding of the videotaped interactions to identify potential behavioral mechanisms leading more anxious people to present a more negative impression. In essence, we hoped to replace the more holistic, impressionistic interpersonal display mediator with more granular coding of behavior. Although potential partners are more likely to be consciously processing interpersonal displays—presumably aggregating specific behaviors at some implicit level—it is the specific behaviors that are more likely to be targeted by interventions. In combination, these two complementary levels of analysis provide a more complete picture of how attachment anxiety is manifested in the context of a relational opportunity.

Given that manifest anxiety was consistently identified across all studies as a mechanism of failure at the level of the interpersonal displays, we focused on identifying the specific behaviors that give rise to this impression of anxiety. We singled out the 20 Study 3 videos that were rated either highest or lowest in manifest anxiety. Three new research assistants, who were blind to the previous ratings and to attachment, extensively reviewed the first 10-min segment of these videos. The research assistants independently generated both exhaustive descriptive notes and notes specifically focusing on the particular behaviors that might be indicative or counterindicative of anxiety. These notes were then condensed into a concrete list of behaviors. Using this list, one of the aforementioned research assistants then reviewed the notes again, this time explicitly comparing participants high and low in manifest anxiety so as to identify the behaviors that were especially diagnostic.

Based on these diagnostic behaviors as well as preliminary coding trials we developed and refined a final coding scheme with 16 items to be examined in two rounds: Vocal mechanisms (see Appendix B) and full-modal mechanisms (see Appendix C). Three new research assistants were recruited and trained on the coding scheme using the 15 videos that had been discarded due to suspicion. The research assistants then reviewed the 86 videos each in a different random order. The reliabilities are presented in Table 9.

Table 8  
*Regressions Testing Whether Attachment Anxiety Predicts Each of the Interpersonal Displays (Study 3)*

Predictors for each display	<i>B</i>	<i>SE</i>	<i>t</i> <sup>a</sup>	CI <sub>95</sub>	
				Lower	Upper
Social disengagement					
Intercept	5.26***	0.11	46.81	5.03	5.48
Attachment anxiety	0.06	0.10	0.61	−0.13	0.25
Attachment avoidance	0.19	0.13	1.47	−0.07	0.44
Gender	−0.10	0.23	0.43	−0.55	0.36
Manifest anxiety					
Intercept	3.83**	0.08	47.78	3.67	3.99
Attachment anxiety	0.18*	0.07	2.68	0.05	0.32
Attachment avoidance	0.11	0.09	1.24	−0.07	0.29
Gender	0.04	0.16	0.23	−0.29	0.36

Note. CI<sub>95</sub> = 95% confidence interval.

<sup>a</sup> *df* = 82.

\* *p* < .05. \*\* *p* < .01. \*\*\* *p* < .001.

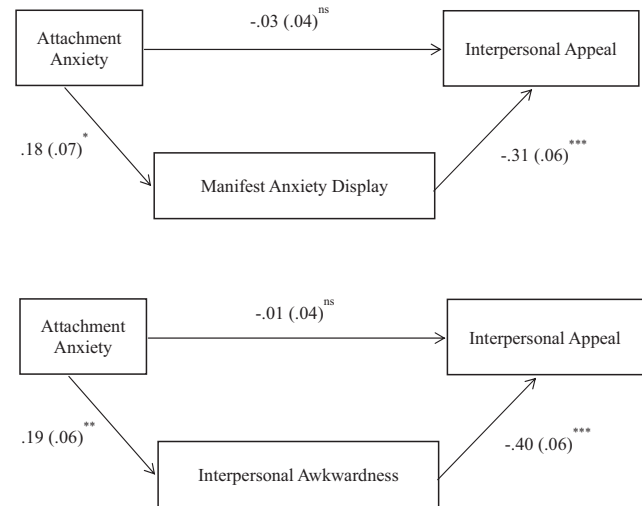


Figure 5. Mediation models linking attachment anxiety to the interpersonal appeal outcome via the manifest anxiety display and via the interpersonal awkwardness behavioral composite (Study 3). Standard errors in parentheses. \* *p* < .05. \*\* *p* < .01. \*\*\* *p* < .001.

**Vocal mechanisms.** As shown in Table 10, two of the tallies and one of the ratings in the vocal modality were correlated with attachment anxiety. More anxiously attached participants had more instances of unclear speech, more awkward silences, and less steadiness of voice. As expected, each of these behaviors was correlated with the display of manifest anxiety, but they were not correlated with the interpersonal appeal outcome. Given that these three behavioral codes were low in reliability, we sought to optimize our efforts by standardizing and combining them into a vocal disfluency composite (i.e., instances of unclear speech + awkward silences + reversed steadiness of voice). This composite is also presented in Tables 9 and 10. It was of higher reliability than the individual codes, although still low. Consistent with its component parts, vocal disfluency was associated with attachment anxiety and the manifest anxiety display, but it was not directly associated with interpersonal appeal.

**Full-modal mechanisms.** As shown in Table 10, three of the full-modal behavioral ratings were associated with attachment anxiety. More anxiously attached participants were more awkward, lower in social skills, and had a more poorly synchronized interaction with the confederate. Each of these behavioral ratings were associated with the manifest anxiety display and the interpersonal appeal outcome. We again sought to optimize our efforts and accordingly created an interpersonal awkwardness composite by standardizing and aggregating awkwardness, social skills (reversed) and synchronization (reversed). This composite is also

<sup>16</sup> We also examined whether the pattern of results found in the first minutes of the interaction changed when the research assistants considered the interaction as a whole. In the interests of space we do not present the full details of these analyses. Overall, participants became more engaged and less anxious as the interaction proceeded, but their appeal didn't change. The effect of attachment anxiety on the displays and appeal did not change over the course of the interaction (i.e., the effects persisted), but interestingly more avoidant participants became significantly less appealing when considering the interaction as a whole.

presented in Tables 9 and 10. Consistent with its component parts, the composite was associated with attachment anxiety, the display of manifest anxiety, and the interpersonal appeal outcome.

**Mediation by behavioral mechanisms.** Based on the preceding analyses, we focused on testing a mediational model whereby attachment anxiety is associated with higher interpersonal awkwardness, which in turn compromises interpersonal appeal.<sup>17</sup> We covaried for attachment avoidance, gender, and baseline physical attractiveness. We again used the Preacher and Hayes (2008) bootstrapping macro in SPSS with 5,000 resamples. The results of the analysis are summarized at the bottom of Figure 5: More anxiously attached individuals exhibited more interpersonally awkward behavior, which lead them to be found unappealing; the estimate of the indirect effect was  $-.08$ ,  $SE = .03$ , 95% CI  $[-.14, -.02]$ .

## Discussion

In this third study, we sought to offer participants a high quality relational opportunity. Compared to the rapid-fire context of speed-dating and the explicitly evaluative context of the videotaped introductions, simply meeting a warm, friendly potential partner in a longer, more structured, and task-oriented interaction seems less likely to provoke social anxiety. However it was still problematic for more anxiously attached participants. Attachment anxiety again predicted negative interpersonal outcomes, whereby more anxiously attached participants were found unappealing, above and beyond their baseline physical attractiveness. Moreover, attachment anxiety predicted a display of manifest anxiety, which

Table 9  
*Reliabilities for the Behavioral Mechanisms (Study 3)*

Behavioral mechanism	Reliability
Sound-focused	
Binary	
Participant interrupted confederate	0.50
Tallies	
Unclear speech	0.36
Self-disclosure	0.67
Awkward silences	0.34
Brief facilitating comments	0.51
Ratings	
Speed	0.60
Volume	0.84
Steadiness	0.35
Amount	0.82
Composite	
Verbal disfluency	0.57
Sound and video	
Ratings	
Awkwardness	0.46
Posture orientation	0.73
Confederate-directed gaze	0.74
Active vs. passive	0.72
Reciprocity	0.62
Social skills	0.69
Synchronization	0.7
Composite	
Interpersonal awkwardness	0.75

Note. For the binary mechanism, reliability was assessed with  $\kappa$  (Cohen, 1960); for all others, it was assessed with an intraclass correlation (3, 3).

Table 10

*Correlations Between the Verbal Disfluency and Interpersonal Awkwardness Behavioral Mechanisms and Attachment Anxiety, the Manifest Anxiety Display, and the Interpersonal Appeal Outcome (Study 3)*

Behavioral mechanism	Attachment anxiety	Manifest anxiety	Interpersonal appeal
Vocal mechanisms			
Tallies			
Unclear speech	0.41**	0.35**	-0.14
Awkward silences	0.30**	0.26*	-0.09
Ratings			
Steadiness	-0.33**	-0.37**	0.09
Composite			
Verbal disfluency	0.40**	0.43**	-0.12
Full-modal mechanisms			
Ratings			
Awkwardness	0.37**	0.46**	-0.37**
Social skills	-0.36**	-0.54**	0.46**
Synchronization	-0.22*	-0.47**	0.36**
Composite			
Interpersonal awkwardness	0.34**	0.56**	-0.45**

Note.  $N = 85$ .

\* $p < .05$ . \*\* $p < .01$ .

mediated the relationship between attachment anxiety and the negative interpersonal outcomes. This pattern of results was apparent within the first 10 min of the interaction and when considering the interaction as a whole. We no longer find the significant association between attachment anxiety and social disengagement—this is consistent with Study 1 but not with Study 2. If the effect of attachment anxiety on social disengagement is small, then we may not have had sufficient statistical power to find it. We will return to the pattern of results for social disengagement across the three studies in the General Discussion.

We also explored the potential behavioral mechanisms whereby attachment anxiety was leading to negative interpersonal outcomes using more fine-grained coding to complement the more holistic, impressionistic interpersonal displays. We found that attachment anxiety was associated with specific negative, off-putting behaviors, which could be grouped together as vocal disfluencies and interpersonal awkwardness. Although vocal disfluencies were a part of the display of manifest anxiety, it appeared that it was interpersonally awkward behavior that contributed directly to negative outcomes.

This initial exploration was not without limitations. In particular, certain behaviors were difficult to code reliably. It is important, though, to acknowledge a particular strength, namely, that the set of research assistants doing the coding of the behaviors was completely different from the set of research assistants who coded the displays and outcomes. The coding of behavior is time consuming and labor and personnel intensive, but we think it is important and valuable data to collect, and

<sup>17</sup> Interpersonal awkwardness also mediates the association between attachment anxiety and the display of manifest anxiety; in the interests of space we do not report this model and instead focus on the mediation of the downstream outcome.



hope that this exploration might offer some initial direction for future research.

Finally, unlike the previous two studies, we found significant effects of attachment avoidance. As with our other null findings, it is possible that the effects of avoidance are small and so we were generally underpowered to find them. Another intriguing possibility suggested by these findings is that in addition to adding more participants, future researchers interested in how avoidance affects relationship initiation might consider adding more time—the effects of avoidance may emerge over the course of a longer interaction. In contrast to anxious attachment models, which are chronically hyperactivated, it may take some time for avoidant attachment models to overcome chronic deactivation and to influence interpersonal behavior in initial interaction contexts.

### General Discussion

In three different, high-impact relationship opportunity contexts, attachment anxiety was a reliable, robust predictor of interpersonal failure and this was apparent within the first minutes of an initial interaction. Specifically, we found that more anxiously attached individuals had fewer partners interested in pursuing contact with them at speed-dating and were rated as less attractive than their physical appearance would merit (Study 1); they were also found to be interpersonally unappealing (Studies 2 and 3). These effects were above and beyond objective physical appearance, which was itself not associated with anxiety (Studies 1 and 3). This is especially impressive given that appearance-based attractiveness is highly salient and is highly predictive of being pursued as a potential dating partner.

Attachment anxiety was associated with characteristic interpersonal displays of social disengagement and of manifest anxiety, which we proposed based on the integration of attachment theory and the self-presentational theory of social anxiety (Leary, 2010; Schlenker & Leary, 1982; Vertue, 2003). These displays then acted as the mechanisms of relational failure. However, the particular display that was driving the effects varied across studies. We believe that these variations were not due to noise, but to meaningful effects of context—that is, individuals high in attachment anxiety behaved both in accordance with their internal states and with the demands of the situation (Arriaga, Agnew, Cappelz, & Lehmler, 2008; Kelley et al., 2003).

The display of manifest anxiety was associated with attachment anxiety across all three studies. It was also a consistent predictor of negative interpersonal outcomes across all three studies and mediated the relationship between attachment anxiety and the outcomes. It would appear that, at least across the three different contexts we looked at here, displays of manifest anxiety are consistently problematic for anxiously attached individuals. In an ironic self-fulfilling prophecy, manifest anxiety over anticipated rejection leads to rejection.

The social disengagement display, like the manifest anxiety display, was a consistent predictor of negative interpersonal outcomes, but the association between attachment anxiety and social disengagement was only found in Study 2. Although we cannot rule out that these between-study differences are due to chance variation, we nonetheless want to consider potential interpretations.<sup>18</sup> One possibility is that although people high in attachment anxiety may be particularly likely to experience the motivation–

expectation conflict that underlies social anxiety, their hyperactivated motivation to connect can overcome the tendency to disengage in certain contexts. Study 2 differed from Studies 1 and 3 in that it did not involve a live interaction with the potential partner—only a self-presentation to that partner via videotape and the prospect of an interaction if that self-presentation was deemed acceptable. In this situation, wherein the partner is desirable but distant and relatively abstract (cf. Eastwick, Finkel, & Eagly, 2011), and evaluation apprehension is high, more anxiously attached participants may adopt a disengagement strategy to preempt painful rejection. It is possible that the face-to-face presence of the potential partner engaging in the interaction is sufficient to overcome this social disengagement, which was not something afforded to Study 2 participants. This lack of a physically present potential partner is not the norm in relationship initiation, but it is part of the online dating paradigm. Although it may seem intuitive that the increasingly popular world of online dating would be helpful to more anxiously attached people, providing a lower pressure situation that would allow them to overcome their insecurities and would mitigate their state social anxiety, it may instead be ironically problematic. The lack of live interaction may lead anxious individuals to be more inhibited (similar to their reticence to send an e-mail overture in Eastwick & Finkel, 2008a). However, a physically present partner might not guarantee engagement. Consider, for example, being unexpectedly introduced to someone by a friend who is trying to encourage your romantic life: “Have you met Ted?” When presented with a live interaction with overt romantic potential (unlike Study 3) that they are unprepared for (unlike Study 1) more anxiously attached people might still freeze or pull away.

Across the three studies, the displays were moderately to highly correlated with each other. Indeed, we propose that they are two different external consequences of the same underlying internal state of social anxiety. It is important to consider that in the real world, potential partners may not be systematically processing particular independent displays, but instead perceive a gestalt impression. Moreover, potential partners may make rapid, binary, approach/avoid decisions, rather than locating their judgment along a dimension. It is nonetheless important to understand the

<sup>18</sup> We tested the hypothesis that the effect in Study 2 was larger than the effect in Studies 1 and 3 using the formula

$$t = \frac{\left[ \hat{\beta}_2 - \frac{1}{2}(\hat{\beta}_1 + \hat{\beta}_3) \right]}{\sqrt{SE_2^2 + \frac{1}{4}(SE_1^2 + SE_3^2)}}.$$

We used the regression coefficients and standard errors reported in the manuscript, standardizing them within each study using the standard deviations of attachment anxiety and of social disengagement (for Study 1 we used the standard deviation of mean social disengagement; N. Bolger, personal communication, May 20, 2013). This gave us an estimate of .21 (equivalent to a standardized regression coefficient, with  $SE = .14$ ) for the difference between Study 2 and the average of Studies 1 and 3, with a 95% CI of  $[-.06, .48]$ . Given that we thought the effect in Study 2 might be larger than the effects in Studies 1 and 3, we conducted a one-tailed test using pooled degrees of freedom,  $t(76) = 1.53$ ,  $p < .07$ . Although the majority of the range of possible values is consistent with the proposed difference, we emphasize that our conceptual speculation about this difference should be interpreted with caution.

component pieces that are leading to the negative impressions anxiously attached people are presenting.<sup>19</sup> Even if the details might not matter to the potential partner, the details are important when it comes to creating interventions to improve relationship initiation outcomes, as discussed further below. Although one would have the longer term goal of alleviating the internal state of social anxiety, in the short-term one might focus on correcting problematic behaviors. However, an intervention that sought only to address social disengagement without addressing the display of manifest anxiety would not be successful—as we show in our studies, even when more anxiously attached people were not significantly more socially disengaged they were nonetheless failing because of their manifest anxiety.

### Strengths, Limitations, and Future Directions

The present research is empirically strong, as all of our mediator and outcome measures were based on the observation of participants' behavior. The use of retrospective or hypothetical self-reports is not uncommon in attachment research and the question of how attachment anxiety is associated with behaviors and outcomes could have been investigated using these methods. Instead, we elected to observe behavior and outcomes in initial interactions directly. Although this presented certain challenges (e.g., necessitating the additional step of coding video tapes, the logistic complexity of conducting research in the field) the reward is that conclusions drawn about behaviors and outcomes in the abstract are in fact based on the observation of behaviors and outcomes that actually occurred.

By contrast, a limitation of the present research would be a near-Skinnerian lack of cognitive or affective data. Although we carefully apply attachment theory and the self-presentational theory of social anxiety to work through the intrapsychic precursors to our predicted interpersonal displays, all of the reported findings occur extrapsychically. Still, it is not one's thoughts or feelings that are the proximal mechanism of failure in an initial interaction with a potential partner, it is the ways in which those thoughts and feelings are made manifest in one's behavior for a potential partner to perceive. Future research should work to provide a better understanding of the particular intrapsychic states that are contributing to negative behaviors.

One of the ways in which it would be helpful to have a more detailed understanding of the underlying cognitions and emotions is to differentiate between attachment anxiety and other constructs. The present research could suggest that attachment anxiety acts like a disposition rather than as a more relational construct (Pietromonaco & Feldman Barrett, 2000). A more traditional dispositional variable that is associated with attachment anxiety would be neuroticism; they are consistently correlated around .40 (see Mikulincer & Shaver, 2007a, Chapter 13, for a review; see also Nofle & Shaver, 2006; Shaver & Brennan, 1992). In the first two studies we measured neuroticism, and although it was consistently correlated with attachment anxiety it was less consistently correlated with interpersonal outcomes and interpersonal displays. This is consistent with previous work which describes attachment anxiety and neuroticism as naturally and theoretically intertwined (Nofle & Shaver, 2006; Shaver & Brennan, 1992). In contrast to neuroticism—which appears to have a biological foundation (Larsen & Buss, 2010) and could predispose one to developing

attachment anxiety—attachment anxiety is founded on experience, and as such can happen to anyone. Even chronically secure or avoidant people have relationships in which they experience high degrees of attachment anxiety and therefore have anxiety schemas available in memory (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996). Certain situations (e.g., meeting a potential partner who calls to mind an ex-partner to whom one was anxiously attached; Brumbaugh & Fraley, 2006) could invoke the motivation–expectation mismatch characteristic of attachment anxiety and state social anxiety. In focusing on attachment anxiety and the principles of attachment theory more generally, as well as integrating work on the self-presentational model of social anxiety, this research is applicable beyond general individual differences.

Having demonstrated that attachment anxiety is detrimental to behavior and outcomes in initial interpersonal interactions, what possibilities exist to ameliorate these effects? From the attachment theory perspective, the type of intervention that is typically pursued is priming felt security. Most people, even the chronically anxiously attached, have had some relationships wherein they experienced felt security and so have secure schemas available even if they are not ordinarily activated (Baldwin et al., 1996). There is a large literature in which researchers have used various priming techniques to increase the accessibility of felt security (see Mikulincer & Shaver, 2007b, for a review). However, in the context of a relational opportunity the potential partner may be such a salient feature of the situation as to overwhelm any subtle priming effects. One way to maximize the effectiveness of a felt security prime would be to embed it in the situation using transference techniques (Berk & Andersen, 2000). Making the potential partner seem similar to someone who acts as a secure attachment figure to a chronically anxious individual would both make the partner themselves the security prime, and would decrease the perceived risk of their rejection. This would be similar to work by Stinson et al. (2009), wherein features of the interaction partner were manipulated to alleviate participants' rejection concerns.

Considering the question of whether individuals high in attachment anxiety would benefit from cognitive, upstream interventions or would require more situationally embedded, downstream, interventions also suggests the question of what it is in particular that the anxious are doing wrong at the level of discrete behavior. Our exploration of behavioral mechanisms in Study 3 offers two initial avenues for further investigation: First, it appears that the vocal modality is an important channel through which manifest anxiety is being communicated. This is especially interesting as this may be a modality over which it is difficult to exert conscious control. Second, it appears that more anxious participants are demonstrating poor social skills, and having awkward, poorly synchronized

<sup>19</sup> We conducted a principal components analysis of the adjective ratings that were aggregated into our displays of social disengagement (eight items) and manifest anxiety (five items), combining the data from Study 2 and Study 3 so as to maximize our sample size ( $N = 171$ , participant-to-item ratio of slightly over 13:1). Using an oblimin rotation we obtained two components with eigenvalues greater than 1 (7.50 and 2.72, which explained 58% and 21% of the variance, respectively). The two components were correlated,  $r(171) = .31, p < .01$ . Examining the structure matrix, the components were consistent with our proposed displays of social disengagement and manifest anxiety, with 12 of the 13 items loading as expected (loadings  $> .79$  on the expected component; loadings on the other component were at least .36 lower).

interactions. Although problematic, these behaviors may be malleable and amenable to coaching, potentially more easily than are the underlying mental states.

We have focused in the present research on interpersonal behaviors that lead to failure in the face of relational opportunities, but the reverse is an equally interesting question: How can one successfully capitalize on a relational opportunity? Social psychological research has highlighted several variables as keys to attraction and liking in initial interactions: Physical attractiveness (e.g., McClure et al. 2010; Walster, Aronson, Abrahams, & Rottman, 1966), reciprocity of liking (e.g., Beckman & Secord, 1959; Eastwick, Finkel, Mochon, & Ariely, 2007), and similarity (e.g., Byrne, 1961; Klohnen & Luo, 2003). Evolutionary theories have also focused on physical attractiveness, as well as warmth and status (e.g., Fletcher, Simpson, Thomas, & Giles, 1999; Li, Bailey, Kenrick, & Linsenmeier, 2002). The self-presentation literature would offer the constellation of behaviors involved in ingratiation: Conforming with and enhancing the other as well as strategic self-presentation (e.g., Jones, 1975, 1990). The displays and behaviors that we found to be associated with attachment anxiety would compromise all of the above: Disengaging is not pursuing ingratiation. Disengagement is antithetical to warmth and would not allow one to communicate similarity or reciprocated liking. Being manifestly anxious would likewise communicate neither liking nor status, and awkward, socially unskilled behavior that is uncoordinated with the partner would not facilitate ingratiation. Finally, our findings in Studies 1 and 3 were above and beyond the effects of physical attractiveness—indeed, the findings suggest that perceptions of attractiveness are negatively distorted by anxious, awkward behavior.

Finally, a consideration that has not been addressed in the present research is how the attachment style of the potential partner might affect relationship initiation. Research has started to examine attachment effects on attraction and partner choice (Birnbaum & Reis, 2012; Frazier, Byer, Fischer, Wright, & DeBord, 1996; Klohnen & Luo, 2003), testing hypotheses about complementarity (e.g., anxious-avoidant pairing) and similarity (e.g., anxious-anxious pairing) as well as more general effects of security or insecurity. We did not pursue the dyadic question as it was not directly relevant to our present investigation of how attachment anxiety leads to interpersonal failure. Of the studies presented here, only the speed-dating data set would include information about the attachment of the potential partner. We speculate that speed-dating a secure partner would be similar to the interactions with our warm, friendly confederate in Study 3—that is, less helpful in enabling anxiously attached people to overcome their insecurities than we might hope. Ideally, as relationship initiation research continues to expand, it will become more dyadic, similar to the progression made by research on established relationships.

## Conclusion

The present research presents ugly—and ironic—truths for individuals high in attachment anxiety: When presented with a relational opportunity, they will most likely fail. They are seen as less appealing and less attractive than they might objectively deserve, and they are less often pursued as potential partners. Unfortunately, these negative relationship initiation outcomes are likely to reinforce and exacerbate the negative expectations underpinning their state social anxiety and will keep individuals high in

attachment anxiety from developing the new, satisfying relationships that might help them to overcome their relational insecurity.

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## Appendix A

### Formulae for Composites in Studies 2 and 3

Interpersonal appeal = likeable + nice + attractive (Study 2 only).

Manifest anxiety = anxious – enjoying themselves + tense + worried.

Social disengagement = aloof – approachable + distant – expressive – friendly + inhibited – outgoing + subdued.

*Note.* Social disengagement was originally conceived of as two composites during the design of Study 2: affiliation and inhibition; these were combined for parsimony, as they were highly intercorrelated,  $r(83) = -.84, p < .001$ .

## Appendix B

### Coding Form for Vocal Mechanisms in Study 3

Behavior	Tally	
Stammering or mumbling, unclear speech		
Self-disclosure (i.e. provides self-relevant information; unprompted; DOES NOT include simply answering question but DOES include elaborating beyond minimum answer to question)		
Moments of awkward silence		
Brief facilitating comments (e.g. uh-huh, yeah, go ahead, right, wow).		

Interrupts or cuts off confederate?	0	1
	No	Yes

Speed	-3	-2	-1	0	1	2	3
	Very slow			Average			Very fast
Volume	-3	-2	-1	0	1	2	3
	Very quiet			Average			Very loud
Steadiness of voice	-3	-2	-1	0	1	2	3
	Very unsteady, variable			Average			Very even and regular
Amount	-3	-2	-1	0	1	2	3
	Very little (very little talking, primarily one-word answers, very concise)			Average amount of talking--neither very concise nor very talkative			Very much (uses many words, very talkative)

*Note.* Sound-focused (i.e., watch with both sound and video, but focus on sound).

(Appendices continue)

## Appendix C

## Coding Form for Full-Modal Mechanisms in Study 3

Did the participant act in a way that was awkward (e.g. awkward laughter, joke that wasn't funny, awkward body language, etc.)?	-1 No	0 Average	1 Yes
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Overall orientation of posture (tilt & twist relative to neutral objects; 0 = form)	-3	-2	-1	0	1	2	3
	Mostly away from confederate		Mostly straight ahead or neutral		Mostly towards confederate		

Confederate-directed gaze: How much did the participant look at the confederate? (use orientation of head to assist; relative to neutral objects; 0 = form)	-3	-2	-1	0	1	2	3
	Away from confederate (never looks at confederate)		Average (glances over at confederate to facilitate the task progression, but is clearly only interested in confederate as a partner for this task)			Primarily confederate (does not take eyes off confederate)	

How active versus passive was the participant?	-3	-2	-1	0	1	2	3
	The participant was extremely passive		The participant was balanced between active and passive		The participant was extremely active		

How much reciprocity was there in the interaction?	1	2	3	4	5	6	7
	There was very little reciprocity, the interaction was one-sided (either on the part of the participant or the confederate)				There was excellent reciprocity, the interaction was well-balanced between both people		

Rate the participant's social skills (e.g. listening, attention to non-verbal cues, clear communication)	1	2	3	4	5	6	7
	Poor; the participant was socially unskilled			Average	Excellent; the participant was highly socially skilled		

Synchronization	1	2	3	4	5	6	7
	Poor; the interaction was choppy and poorly-coordinated (awkward silence, cutting-off)			Not painful, but also not necessarily pleasant; average level of coordination	Good; the interaction was smooth and perfectly-coordinated (smooth, flowing, clear attention to communication signals and cues; anticipates when partner will stop talking, and know when to begin talking; facilitating comments at correct times without cutting off or producing awkwardness)		

*Note.* Sound and video.

Received September 16, 2012  
Revision received July 22, 2013  
Accepted July 25, 2013 ■