**PLEASE STOP RUBBING YOUR RELATIONSHIP IN MY FACE(BOOK):
AN INVESTIGATION OF ONLINE ROMANTIC SOCIAL COMPARISON**

by

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Abstract

It is well-documented that social networking sites such as Facebook set the stage for social comparison. Such comparison has been linked to a number of negative outcomes including envy, negative moods, and lower self-esteem. The present research aims to extend current understanding of online social comparison by investigating how it pertains to romantic relationships. I hypothesized that for individuals high in attachment anxiety (compared to those low in this construct), online romantic social comparison might be related to negative consequences—which, in the current project, was operationalized as lower mood/affect and state self-esteem. Further, I hypothesized that there would be an interaction between attachment anxiety and relationship insecurities on these negative outcomes, such that the expected difference of attachment anxiety would be more pronounced under conditions priming relationship insecurities, relative to a control condition. Two experiments were conducted, one of which focused on single individuals, and the second focusing on individuals who were themselves in dating relationships. The paradigms of each entailed experimental manipulation of a key relationship-related variable (for single individuals, pessimism for future relationships; for dating individuals, the presence or absence of rejection threat), subsequent exposure to romantic content from Facebook, and finally, measures of affect and state self-esteem. I discovered partial support for the hypothesis that some single individuals—particularly those with higher, rather than lower, attachment anxiety—do indeed report feeling more negative moods and lower state self-esteem following exposure to romantic online content, in contrast to single individuals who had instead viewed neutral online content. The association between attachment anxiety and negative outcome was especially pertinent if individuals had been primed to believe that their own future romantic prospects were grim, or if attention had been drawn to their singleness. Among dating individuals, less support for hypotheses was found; however, exploratory post-hoc analyses revealed a promising (albeit weak) trend indicating that reinvestigation of the current hypotheses would be prudent.

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Chapter 1

Introduction

The society in which we live boasts connectivity. With a mere tap or click, we are able to connect with family, friends, or even strangers—due largely to the advent of social networking sites (SNSs). We can chat in real time with someone half way across the globe on Skype, peruse the photographs of others’ artfully-arranged meals on Instagram, keep tabs on the career trajectories of colleagues on LinkedIn, and monitor the obscure thoughts of friends condensed into 140 characters on Twitter. However, arguably the most notable of all social networking sites is Facebook. With over 936 million daily active users and 1.44 billion monthly active users, this site is touted as the world’s largest social networking site (Facebook, 2015). The prominence of Facebook has led to a growing body of literature concerning its use. The utility of SNSs in creating and maintaining connections appears undebatable. However, does the constant connectivity come at a cost?

Social Media and Social Comparison

According to Festinger (1954), social comparison is the process by which individuals evaluate themselves based on how they measure against others. Two comparison types have since been identified: downward and upward. While the former pertains to comparisons made with someone worse off, the latter entails comparing oneself to someone better off (Wills, 1981). In relating social comparison to social media, consider that SNSs set the stage for social comparison. It is easier now than it ever has

been to access enough information about other people in order for comparisons to be drawn with friends, acquaintances, or strangers.

Further, SNSs offer users the ability to self-select information posted on their personal profiles. For example, Facebook users can strategically customize and control any information posted about them, thus allowing for the ability to present and maintain certain personas to the public (Chen & Marcus, 2012; Christofides, Muise, & Desmarais, 2009). In general, individuals have a tendency to highlight positive attributes for self-enhancement purposes (Schlenker & Pontari, 2000), and recent research has found that this pertains also in online environments: an individual's Facebook profile will often emphasize positive attributes and filter out the negative (Bazarova, Taft, Choi, & Cosley, 2013; Chou & Edge, 2012; Gonzales & Hancock, 2011; Lee-Won, Shim, Joo, & Park, 2014; Qui, Lin, Leung, & Tov, 2012). Not only does this tendency affect the formation of interpersonal relationships, but viewing one's own carefully-constructed profile afterwards has been shown to enhance self-esteem (Gonzales & Hancock, 2011). Given these findings, it would stand to reason that a majority of the content SNS users come across is positive in nature—and as a consequence, one is less likely to engage in downward social comparison and more likely to engage in upward social comparison when viewing others' pages. Such a conjecture has been validated in the literature. It has been shown that increased Facebook use leads to more upward, rather than downward, social comparison (Midgley, 2013). Indeed, users perceive others as leading happier and more successful lives than themselves (Chou & Edge, 2012). Online social comparisons of this nature are related a number of consequences, including: envy, especially if one is just passively browsing others' profile, which is subsequently linked to lower life

satisfaction (Krasnova, Wenninger, Widjaja, & Buxmann, 2013), depressive symptoms (Tandoc, Ferruci, & Duffy, 2015), lower self-esteem and feeling worse about oneself (Midgley, 2013), and negative moods and emotions (Fardouly, Diedrichs, Vartanian, & Halliwell, 2015; Fox & Moreland, 2015; Lee, 2014).

Social Media and Romantic Relationships

Social networking sites are aptly named—they are meant to facilitate social endeavours, and allow people to foster, maintain, and form interpersonal relationships through an online environment created exclusively to promote interaction with others. By being able to control how one presents oneself online, users can indirectly influence the formation of interpersonal relationships (Gonzales & Hancock, 2011). Further, by providing ample opportunities for socialization and interactions with others, Facebook and similar SNSs have been linked to enhanced social self-esteem (Ellison, Steinfield, & Lampe, 2007; Valkenburg, Peter, & Schouten, 2006), increased social trust (Valenzuela, Park, & Kee, 2009), and can allow for relationship maintenance (McEwan, 2013).

Investigations into how SNS use factors into romantic relationships are fewer in quantity, albeit not altogether absent. From such investigations, it has been revealed that SNS use can impact romantic relationships by increasing opportunities for excessive surveillance of a partner's online activity, which subsequently promotes romantic jealousy (Billedo, Kerkhof, Finkenauer, 2015; Utz & Beukeboom, 2011) particularly among individuals high in attachment anxiety (Fox & Warber, 2014; Marshall, Bejanyan, Di Castro, & Lee, 2013). The consequences of this online surveillance and subsequent jealousy can be quite severe: a number of studies have discovered SNS/Facebook use to

be a significant predictor of romantic dissatisfaction, conflict, cheating, and even divorce (Clayton, Nagurney, & Smith, 2013; Fox Osborn, & Warber, 2014; Valenzuela, Halpern, & Katz, 2014). SNS use can even delay emotional recovery following the termination of a relationship, by allowing for surveillance of ex-partners, which has been shown to increase breakup distress (Lukacs & Quan-Haase, 2015).

In speaking to factors that influence or are influenced by romantic content posted on SNSs, it has been revealed that certain variables—namely, an individual’s attachment orientation and relationship security—affect how willing someone is to publically display or announce his/her relationship online. In particular, having high attachment anxiety and relationship insecurities both lend themselves to fostering a higher desire for relationship visibility, for the purposes of impression management (Emery, Muise, Dix, & Le, 2014). Despite this finding, posting relationship information on Facebook is not necessarily related to poor outcome; in fact, the opposite has been demonstrated, with higher relationship satisfaction reported by individuals whose profile pictures were of themselves and their romantic partner, relative to individuals whose profile pictures did not include their partner (Saslow, Muise, Impett, & Dubin, 2013). Taken together, these studies indicate that, for the individuals involved in the relationship in question, there is an interplay between personal attributes that influence whether relationship visibility online is desired, and in turn, the correlates of visibility on the relationship.

The growing body of literature clearly indicates that Facebook and SNS use can be strongly associated with the health and success of one’s romantic relationships. However, consider that by posting material online, the relationship becomes privy to more than just the two individuals that comprise the couple: a third party, the viewers, enters the

equation. Even less investigation has been conducted from the perspective of the viewers. Although Emery, Muise, Alpert, and Le (2014) were able to demonstrate that viewers draw inferences about the quality of the romantic relationships they view on Facebook and the likeability of the individual posting the romantic content, there has been no exploration into whether the audience may be affected by viewing relationship-related information on social media.

The Present Study: Romantic Social Comparison on Social Media

In tying the two above-mentioned themes together, consider that one mechanism through which the external viewers might be affected by others' romantic online content is social comparison. If users' tendency to put forth a positive self-presentation extends also to a romantic domain, which there is reason to believe is true (Emery, Muise, Dix, & Le, 2014), then the stage for upward romantic social comparison is set. Indeed, if a viewer is prone to social comparison and is convinced—because of the carefully-crafted and hand-picked information he is confronted with on Facebook—that almost everyone is involved in a happy romantic relationship except for him, then it stands to reason that viewing such information may be detrimental. Interestingly, romantic social comparison, even offline and in the “real” world environment, has only been sparsely investigated. Most research in this area focuses on comparisons drawn between the individuals within a given relationship; less has been conducted on comparisons drawn against others in an external relationship. The small amount of research that has been conducted, however, indicates that relative to general social comparison, romantic comparisons have been demonstrated to evoke more negative feelings about oneself (Salovey & Rodin, 1986).

Further, it has been revealed that comparing one's own relationship against the relationship of someone else strongly influences relationship satisfaction, in that perceiving one's relationship to be better off than the relationships of others can be related to higher satisfaction (Buunk & VanYperen, 1989). Given the sparseness of research in this area, and the fact that SNSs foster an environment where individuals are exposed to many potential triggers for romantic envy and romantic social comparison, this line of questioning has important implications. In the current program of research, I investigated whether there is indeed a subset of people for whom viewing romantic content on Facebook (and by extension, other SNSs) yields negative effects. I further wished to explore whether certain personal variables and characteristics played a moderating role on how impactful viewing others' romantic content might be. Some of these variables are outlined below.

Attachment orientation. First described by Bowlby (1969), attachment orientations are said to develop in infancy and lay the foundation for all subsequent interpersonal relationships the infant will eventually foster, including romantic relationships. Specifically, the responsivity and consistency of care that one receives as an infant from the primary caregiver subsequently influences how much one feels worthy of love and affection, and whether he/she feels comfortable depending on others (Simpson, 1990). Originally, three primary attachment styles were identified: anxious, avoidant, and secure (Ainsworth, Blehar, Waters, & Wall, 1978). Now, attachment orientation is better conceptualized as comprising two continuous dimensions: anxiety and avoidance. Specifically, individuals who are low on both dimensions—and thus deemed to have secure attachment—experience healthier and more stable relationships.

On the other hand, anxious and avoidant attachment orientations are comparatively less conducive to healthy romantic relationships. Those high in attachment anxiety are often highly dependent and fear rejection and abandonment, while high attachment avoidance is characterized by partner mistrust and trying to distance oneself from others (Feeney & Noller, 1990). Given the differences between the various attachment orientations, it is likely that relative to those low in anxious attachment, individuals higher in attachment anxiety are most likely to be affected by viewing others' romantic content: these are the individuals who are subject to relationship insecurities and need constant reassurance from partners. As such, viewing information that suggests that others are having (seemingly) happier relationships than they are may exacerbate such insecurities.

Relationship-contingent self-esteem. Research has shown that an individual's sense of self—and tied to it, self-esteem—can be contingent on perceived success or performance on a domain he/she identifies with (Crocker & Wolfe, 2001). In particular, individuals high in relationship-contingent self-esteem are those whose self-definition is influenced by the relationships in their lives to an unhealthy extent (Knee, Canevello, Bush, & Cook, 2008). Much of their self-evaluation depends on the perceived authenticity and security of their relationships. As such, these individuals are heavily influenced by relationship-related events in their lives. I hypothesize that because they are more attuned to relationships in general, individuals high in relationship-contingent self-esteem will be more affected by others' romantic content and draw comparisons, relative to individuals who are low in relationship-contingent self-esteem.

Fear of being single. This is a recently introduced construct measuring the extent to which an individual experiences anxiety or distress about not having a romantic

partner (Spielmann et al., 2013). The anxiety or distress experienced can be either current (i.e., when the individual is experiencing concern about his/her current state of singleness) or prospective (i.e., when the individual is currently in a relationship, but exhibits anxiety about potentially losing the current partner, thus resulting in singleness). Individuals with a high fear of being single have been shown to settle for less satisfying relationships (Spielmann et al., 2013). In the context of the current study, I hypothesize that, compared to those who report less of such a fear, individuals who have a high fear of being single will be more impacted by viewing others' romantic content. Presenting these individuals with examples of others' happy relationships might provoke negative mood and lower self-esteem by priming their insecurities concerning singleness.

Tendency to engage in social comparison. After the phenomenon of social comparison was first documented by Festinger (1954), it became a commonly-held belief that the tendency to engage in comparisons in order to learn more about the self was universal and fundamentally human. Indeed, the extensive literature on social comparison that has accumulated since 1954 validates the claim that virtually all humans engage in social comparison. In fact, some have proposed that social comparison may have roots very early on in human phylogeny (Gilbert, Price, & Allan, 1995). However, more recent research has revealed that although all humans engage in social comparison, the extent to which people do so varies from individual to individual (Gibbons & Buunk, 1999). In applying this finding to the current investigation, it would be prudent to acknowledge that individual differences in the tendency to engage in social comparison exist. Because my hypothesis is that social comparison will be the mechanism through which negative consequences follow from viewing online romantic content, any observable effects may

be moderated by this variable such that those who are not prone to social comparison will be less affected by the content than those with a higher tendency to engage in social comparison.

Trait self-esteem. By definition, trait self-esteem is a global, stable, and enduring perception of one's own self-worth (Leary, 1999). This is to be distinguished from state self-esteem, which is a momentary evaluation of self-worth that is prone to fluctuation (Heatherton & Polivy, 1991). In the context of the current study, trait self-esteem is an important variable to consider, given its documented correlations with other variables of interest. For example, trait self-esteem is negatively correlated with attachment anxiety (Roberts, Gotlib, & Kassel, 1996), can be conceptualized as a “baseline” against which to measure state self-esteem (Heatherton & Polivy, 1991), and can help partly account for differences in individuals' subjective experiences of romantic love (Dion & Dion, 1975). Consequently, trait self-esteem should hypothetically account for some of the variance that I might observe in negative reactions to online romantic content.

Summary of Hypotheses

My primary hypothesis is that, for a subset of individuals, viewing the romantic content of others posted online will have negative consequences—which I have operationalized as lower mood and state self-esteem. I predict two main effects, as follows. First, I hypothesize that single individuals who are pessimistic about finding their own romantic partner in the future will be more impacted, relative to single individuals who are optimistic. Second, dating individuals who have had threats

introduced in their relationship will be more impacted than dating individuals who feel secure in their relationship.

I further hypothesize that the extent to which people experience negative consequences will either be attenuated or exacerbated by individual difference variables. Specifically, I predict that interactions with attachment anxiety will emerge, such that the state self-esteem and mood of individuals high in attachment anxiety will be more impacted than that of individuals who are low in attachment anxiety. Indeed, the link between attachment anxiety and romantic insecurities is well-documented and supported by a large body of literature (Brennan & Shaver, 1995; Campbell, Simpson, Boldry, & Kashy, 2005; Hazan & Shaver, 1987; Simpson, 1990). As a consequence, it logically follows that these romantic insecurities will still be present in the online environment.

Although other individual difference variables will be measured in the current investigation, they will be incorporated into analyses in an exploratory manner. The reason underlying such a decision is that these individual difference variables are either not as explicitly linked to romantic concerns (social comparison orientation, trait self-esteem) or much newer constructs not as well-established in literature (relationship-contingent self-esteem, fear of being single). Although these variables may also play into the relationship between the experience of negative consequences and viewing others' romantic content, I hypothesize that attachment anxiety will be strongly correlated with them (positively with each of relationship-contingent self-esteem, fear of being single, and social comparison orientation, and negatively with trait self-esteem), such that multicollinearity concerns would arise should I simultaneously look at them alongside attachment anxiety. Regardless, if it is true that such correlations do indeed exist, then it

can be reasoned that observable trends would not differ greatly as a function of which individual difference variable is conceptualized as a continuous predictor.

Finally, I hypothesize that beyond affecting viewers' personal mood and self-esteem, the interaction of the above-named variables might also predict how viewers react to the female individual who posted the content, perhaps by influencing whether they form positive or negative impressions of her. Research has shown that, when one's own self-image is threatened, derogating others may be a means to affirm the self and increase self-esteem (Fein & Spencer, 1997). In the context of the current study, if negative consequences are indeed incurred as a result of viewing online romantic content, then I hypothesize that participants will also form negative impressions of the viewed individual.

Chapter 2

Study One

The first study served as an initial test of my hypothesis that, for a subset of people, negative consequences are associated with viewing online romantic content. I chose to operationalize such consequences as lower mood and state self-esteem, and tested this hypothesis by investigating whether those viewing romantic content would report more negative moods and lowered state self-esteem in contrast with those viewing romantically-neutral content—and that whether this effect would be especially apparent for participants with high levels of certain individual difference variables (attachment orientation, relationship-contingent self-esteem, and fear of being single).

For the current study, I focused exclusively on single individuals—those who were not involved in romantic relationships of any sort at the time of study participation. I reasoned that the types of comparisons a single individual might draw while viewing romantic online content would vary substantially from the comparisons drawn by individuals who are themselves in a relationship. Indeed, a single individual might be prompted to reflect on the fact he/she currently does not have a romantic partner, while a dating individual would instead be prompted to reflect on how his/her current relationship matches up against the depicted relationship. Further, for single participants, perceived likelihood of finding one's own romantic partner in the future may also factor into any observable effects, such that individuals who are optimistic about their own romantic prospects will be less negatively affected than those who are pessimistic, because they may find the romantic content to induce hope. Because of these hypothesized differences between single and dating individuals, I chose to investigate these populations separately

in Study One (singles) and Study Two (daters). The paradigm of Study One followed a 2 (social comparison condition: neutral or romantic) by 3 (manipulation of pessimism for future relationships: pessimistic, optimism or control) between-subjects design.

Finally, online romantic content was operationalized in this study as a series of photographs taken from a female individual's Facebook page, with her express consent.¹ Although Facebook does allow for transmission of other types of content as well (i.e., status updates, wall posts, etc.), photographs are not unique to only Facebook; instead, they are a shared feature across all social networking sites, thus allowing for broader conclusions about SNSs in general to be drawn from results found in the current study. Furthermore, pictures are often more salient and effective at conveying content in contrast to text-based content (Plaue, Miller, & Stasko, 2004).

Participants

Participants were 235 female undergraduate students attending Queen's University and enrolled in a first-year introductory psychology course. The average age of participants was 18.33 years ($SD = 1.38$). To be eligible for the study, participants had to self-report to be single, either via email a week prior to participation, or upon arrival to the lab. Extra course credit was provided to participants as compensation.

Of the 235 participants who participated, a total of 201 were included in analyses. The remaining 34 participants were excluded because they had not completed the

¹ This individual was chosen partly because of her geographical location outside of Canada; this was to ensure that none of the participants would know her and thus be unduly affected by their relationship with her. She is mixed-race, and self-identifies as both Caucasian and Chinese—the two ethnicities that (anecdotally) comprise a vast majority of students enrolled in the first-year psychology course from which I recruited. In most of the photographs chosen for use in this study, this female individual was approximately 20 to 22 years of age.

prescreening battery of questionnaires. This battery is administered at the beginning of the school year to all students enrolled in the introductory psychology course, and comprises a variety of standardized measures—several of which were crucial in the current study.

The rationale underlying the decision to study only women is partly logistic in nature: women comprise the vast majority of students who take introductory psychology at Queen's University. Additionally, in the laboratory where this study occurred, it has been anecdotally reported that the relatively low proportion of men who do take this course tend to shy away from participating in studies pertaining to relationships. As a result, I believed it was unlikely to have been able to recruit enough men to provide a reasonable test of gender differences. Furthermore, there is a literature to suggest that the self-construals of women are more focused on relationships compared to those of men (Guimond, Chatard, Martinot, Crisp, & Redersdorff, 2006), so men may perhaps be less affected by social comparisons of a romantic nature.

Procedure and Measures

Prescreening measures. At the beginning of the school year, students filled out the prescreening battery of questionnaires, which included measures of attachment anxiety, trait self-esteem, relationship-contingent self-esteem, fear of being single, and the tendency to engage in social comparison. These individual difference variables were later used as predictor variables in the analyses. Questionnaires used to measure these variables are described below, and can be found in Appendix B.

Rosenberg Self-Esteem Scale (RSE). This is a 10-item questionnaire meant to measure participants' general feelings towards themselves. Participants rated the extent to which 10 statements were representative of themselves, on a scale from 1 (*completely disagree*) to 7 (*completely agree*). An example of one of the statements that comprise the RSE is "I feel that I have a number of good qualities". The attitudes and feelings measured by this questionnaire have been shown to be largely static, or trait-like (Rosenberg, 1965). The RSE scale scores demonstrated excellent reliability in the current sample ($\alpha = .90$).

Scale for Social Comparison Orientation. This is an 11-item scale meant to measure the degree to which a participant has a propensity for comparing himself/herself to other people (Gibbons & Buunk, 1999). For example, participants were presented with a statement such as, "I always like to know what others in a similar situation would do", and asked to rate how much they agree with the statement. Answers were given along a 7-point scale, from 1 (*I strongly disagree*) to 7 (*I strongly agree*). Internal consistency of scale scores in the current sample was good ($\alpha = .86$).

Experiences in Close Relationships-Revised (ECR-R). This scale is a measure of attachment orientation, and provides a gauge of how securely attached an individual is in his/her relationships. Half of the 36 items pertain to attachment anxiety, while the remaining items pertain to attachment avoidance (Fraley, Waller, & Brennan, 2000). An example of an item relating to attachment anxiety is "I often worry that my partner doesn't really care about me", and an example of an item relating to attachment avoidance is "I prefer not to show a partner how I feel deep down". Participants rated the extent to which they identified with each item along a Likert scale ranging from 1

(*strongly disagree*) to 7 (*strongly agree*). The reliabilities for both attachment anxiety ($\alpha = .93$) and avoidance ($\alpha = .93$) scale scores were excellent in the current sample.

Fear of Being Single Scale. This is a 6-item scale used to assess an individual's fears (or lack thereof) concerning the prospect of not having a romantic partner, and the extent to which he/she desires one (Spielmann et al., 2013). An example of one of the items on this scale is: "I feel it is close to being too late for me to find the love of my life". For each item, participants rated how much they agreed with the presented statement, on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Reliability for this scale's scores was good in the current sample ($\alpha = .85$).

Relationship-Contingent Self-Esteem Scale. This is a 10-item scale designed to measure the extent to which one bases their self-worth on his/her relationships (Knee, Canevello, Bush, & Cook, 2008). For example, one of the four statements on this scale is: "My feelings of self-worth are based on how well things are going in my relationship". Participants rated the extent to which they identified with each statement along a 7-point Likert scale ranging from 1 (*I strongly disagree*) to 7 (*I strongly agree*). In the current sample, reliability for this scale's scores was good ($\alpha = .83$).

Ethics. Upon arrival to the lab, participants' dating status was confirmed, and they were provided with a letter of information and consent form to sign (see Appendix A for all ethics documents), both of which were presented electronically on SurveyMonkey. They were advised that the purpose of the current study was to investigate their attitudes towards content posted on social networking websites such as Facebook.

Manipulation of pessimism for future relationships. Participants were assigned to one of three groups: pessimistic, optimistic, or control. Assignment was randomized by

means of an online computer program by the name of “Research Randomizer” (www.randomizer.org) that generated multiple sets of numbers, where each set comprised a fixed amount of numbers in random sequence. Each number was associated with a specific group. Consequently, participants were assigned to the next available group in the generated sequence. All participants were told to read a short magazine article, with content in concordance with group assignment. In particular, the optimistic group read an article suggesting that the prospects of finding a romantic partner in the future are bright, while the pessimistic group read an article suggesting the opposite—that the prospects are bleak (adapted from Spielmann, MacDonald, & Wilson, 2009). These two magazine articles were entirely fabricated, but made to sound convincing. Finally, participants in the control condition were not persuaded one way or another about romantic prospects, as they instead read an article completely unrelated to romantic relationships; this article compared the health benefits of soy and almond milk.

Social comparison condition (photographs). After participants finished reading their assigned articles, they were told that they would be presented with personal photographs taken from the Facebook profile of a female individual. They were instructed to peruse these photographs for approximately five minutes, taking time to form an impression of the individual presented in them. The actual photographs viewed by participants varied depending on preassigned social comparison condition. Those in the romantic condition viewed 10 photographs of the female individual, of which five depicted her with her boyfriend. The remaining five photographs were pictures of the individual with platonic friends. Those in the neutral condition also viewed 10 photographs of the same individual, but none of these photographs showed the

individual's romantic partner, nor did they suggest in any way that she might have been in a dating relationship. As such, they viewed the same five photographs of the individual with platonic friends, but the remaining five were solo photographs of the individual.

In-lab questionnaires. Finally, participants completed several questionnaires pertaining to their current mood, state self-esteem, and fear of being single. Participants were also asked to share their impressions of the female person whose pictures they viewed. Several personality-related adjectives were presented (i.e., warm, vain, hard-working, fake, etc.), and participants indicated the extent to which they agreed each adjective described her from 1 (*very slightly or not at all*) to 5 (*extremely*). The validated measures of mood and state self-esteem are described below, and complete questionnaires can be found in Appendix D.

State Self-Esteem Scale (SSES). This scale comprises 20 items and is posited to measure a participant's self-esteem at a specific point in time. In contrast to the Rosenberg Self-Esteem Scale, this scale allows for a measurement of self-esteem that is more fluid and susceptible to change (Heatherton & Polivy, 1991). Some items include “I feel concerned about the impression I am making”, and “I feel inferior to others at the moment”. Participants rate the extent to which they presently identify with each statement on a scale from 1 (*not at all*) to 5 (*extremely*). Four scores can be extracted from this scale: a measure of overall state self-esteem, as well as measures of social, performance, and appearance state self-esteem. Given that Facebook browsing relates to interpersonal relationships, social state self-esteem is of particular interest. In contrast, the performance and appearance state self-esteem scores produced by the SSES are of less interest, given that the former focuses heavily on scholastic ability and the latter

focuses on body image concerns—neither of which are explicitly relevant to romantic relationships. As a consequence, only overall and social state self-esteem was incorporated into subsequent analyses as dependent variables. I predicted that these two scores would both be impacted by romantic social comparison, but more extremely so in the case of social state self-esteem rather than for overall state self-esteem (because the latter is attenuated by the influence of performance and appearance state self-esteem). In the current study, the SSES scores demonstrated strong internal consistency for the overall scale ($\alpha = .93$), as well as for the social state self-esteem subscale ($\alpha = .87$).

The Positive and Negative Affect Schedule (PANAS). This scale seeks to measure a participant's mood by assessing how closely he/she identifies with 20 different emotion words (i.e., Interested, Guilty, Proud, Alert, etc.). Participants are asked to indicate along a scale from 1 (*very slightly or not at all*) to 5 (*extremely*) how much they currently feel each emotion. This scale yields both a positive affect score and negative affect score, and can be used to assess either momentary or long-term mood. For the purposes of the current study, I measured participants' momentary affect (Watson, Clark, & Tellegen, 1988). Internal consistency of the PANAS scores was good in the current study, with $\alpha = .84$ for the 10 items that comprise the negative affect score, and $\alpha = .90$ for the 10 items that comprise the positive affect score.

Results

Data analytic strategy. Data analysis for Study One entailed several general linear models (GLMs), with a model for each of the dependent variables of interest: overall state self-esteem, social state self-esteem, negative affect, and positive affect. For

all models, two categorical independent variables were identified: social comparison condition (neutral or romantic) and pessimism manipulation (pessimistic, optimistic, or control). Attachment anxiety (centered) was identified as a continuous independent variable.² All main effects and possible interactions were included in each model. The other continuous individual difference variables (trait self-esteem, relationship-contingent self-esteem, social comparison orientation, fear of being single) were treated as potential covariates. Separate analyses, each identifying a different covariate, were run; however, it was found that general trends remained the same, regardless of the covariate variable. Consequently, the following analyses will present models that specified trait self-esteem as a covariate, because this variable was most strongly correlated with dependent variables of interest. In the presence of any significant interactions, the data were decomposed and simple slopes analyses were conducted (Aiken & West, 1991).

Beyond affecting viewers' mood and state self-esteem, I was further interested in whether social comparison condition, pessimism manipulation, and attachment anxiety would interact to predict how viewers perceived the individual whose content was presented. As such, factor analysis was used to explore factors/broad dimensions that existed within the 10 personality adjectives participants had been asked to rate the viewed female individual on. These factors guided the creation of 3 different "impression" variables, which were then specified as dependent variables in GLMs similar to those described above.

² Attachment avoidance was not included, as the already-limited sample size would be too underpowered to detect any four-way interactions. Further, attachment avoidance was not hypothesized to be related to romantic social comparison.

Preliminary analyses. Prior to conducting inferential statistics, preliminary analyses were conducted on the dataset. As seen in Table 1, the means of each of the continuous variables of interest in the study were in an acceptable range within their respective scales, in that no extreme values were observed. Standard deviations associated with each mean also appeared to be acceptable. The only exception was the mean for negative affect, for which the sample mean (15) was substantially closer to the lower limit of the scale range (10) than the upper limit (50), suggesting the presence of a positive skew. The skewness value associated with this variable further verified this suspicion.³ As a result, a log transformation was performed on the negative affect variable. However, because subsequent analyses using this transformed variable did not change results substantially, the following sections document results observed using the unaltered negative affect variable. Also of note is that a positively-skewed negative affect distribution is consistent with typical PANAS responses, and the mean momentary negative affect scores provided by the scale's developers of 14.8 ($SD = 7.2$).

Additionally, given hypothesized influences of condition/group assignment on dependent variables, means and standard deviations of affect and state self-esteem for each experimental group have also been provided (Table 2), as opposed to being collapsed across groups (as in Table 1). The 3 (manipulated pessimism for future relationships) by 2 (social comparison condition) design of this study resulted in a total of six experimental groups.

³ Skewness values were assessed using guidelines provided by Bulmer (1979), suggesting that a skewness statistic with an absolute magnitude of 0.5 or smaller is considered fairly symmetrical, while anything larger than this suggests the presence of skew. Absolute values of 1 or greater are considered highly skewed.

Table 1

Descriptive Statistics of Independent and Dependent Variables.

Measure	<i>M</i>	<i>SD</i>	<i>n</i>	Range	Skew	Kurtosis
Attachment Anxiety	3.91	1.16	201	1 - 7	-.04	-.23
Relationship-Contingent Self-Esteem	4.59	1.15	162	1 - 7	-.32	.47
Fear of Being Single	4.14	1.60	176	1 - 7	-.13	-.83
Social Comparison Orientation	4.65	1.00	217	1 - 7	.06	-.08
Trait Self-Esteem	4.92	1.13	218	1 - 7	-.42	.03
Negative Affect	15.09	5.27	222	10 - 50	1.51	2.46
Positive Affect	26.45	8.11	222	10 - 50	.13	-.42
Overall State Self-Esteem	3.42	0.66	222	1 - 5	-.27	.01
Social State Self-Esteem	3.44	0.81	222	1 - 5	-.30	-.47

Table 2

Means of Dependent Variables by Experimental Group.

Measure	Negative Affect	Positive Affect	Overall State Self-Esteem	Social State Self-Esteem
Optimism Condition by Romantic Condition (<i>n</i> = 36)	<i>M</i> = 15.25 <i>SD</i> = 5.37	<i>M</i> = 25.42 <i>SD</i> = 7.40	<i>M</i> = 3.36 <i>SD</i> = 0.67	<i>M</i> = 3.32 <i>SD</i> = 0.83
Optimistic Condition by Neutral Condition (<i>n</i> = 37)	<i>M</i> = 14.78 <i>SD</i> = 4.59	<i>M</i> = 24.70 <i>SD</i> = 8.82	<i>M</i> = 3.38 <i>SD</i> = 0.76	<i>M</i> = 3.41 <i>SD</i> = 0.90
Pessimistic Condition by Romantic Condition (<i>n</i> = 37)	<i>M</i> = 16.16 <i>SD</i> = 6.72	<i>M</i> = 25.95 <i>SD</i> = 6.65	<i>M</i> = 3.46 <i>SD</i> = 0.64	<i>M</i> = 3.43 <i>SD</i> = 0.84
Pessimistic Condition by Neutral Condition (<i>n</i> = 40)	<i>M</i> = 14.68 <i>SD</i> = 5.04	<i>M</i> = 28.00 <i>SD</i> = 8.38	<i>M</i> = 3.43 <i>SD</i> = 0.63	<i>M</i> = 3.43 <i>SD</i> = 0.76
Control Condition by Romantic Condition (<i>n</i> = 37)	<i>M</i> = 14.35 <i>SD</i> = 4.41	<i>M</i> = 26.62 <i>SD</i> = 9.60	<i>M</i> = 3.57 <i>SD</i> = 0.62	<i>M</i> = 3.67 <i>SD</i> = 0.71
Control Condition by Neutral Condition (<i>n</i> = 35)	<i>M</i> = 15.40 <i>SD</i> = 5.34	<i>M</i> = 27.94 <i>SD</i> = 7.32	<i>M</i> = 3.35 <i>SD</i> = 0.65	<i>M</i> = 3.34 <i>SD</i> = 0.83

Correlation analyses. Bivariate correlations between each of the variables for the entire dataset (presented in Table 3) were generally moderate to large.⁴ Most correlations among the independent individual difference variables ranged from moderate to strong, with the strongest correlation observed between attachment anxiety and fear of being single, $r(169) = .51, p < .01$, and the smallest correlation between trait self-esteem and relationship-contingent self-esteem, $r(161) = .29, p < .01$. All correlations were in the expected direction, with positive correlations among attachment anxiety, relationship-contingent self-esteem, fear of being single, and social comparison orientation—each of which were negatively correlated with trait self-esteem. Attachment avoidance was minimally correlated with all other variables of interest (save for a moderate negative correlation with trait self-esteem), and as such was not included in subsequent analyses. In speaking to correlations among dependent variables, social state self-esteem and overall state self-esteem were, as expected, very strongly correlated, $r(221) = .89, p < .001$. Negative and positive affect were somewhat strongly related to these state self-esteem scales, but not correlated with one another.

Consistent with my hypotheses, attachment anxiety was seen to be substantially correlated with various dependent variables. Specifically, attachment anxiety had strong negative correlations with the state self-esteem variables, and weak positive and negative correlations with negative affect and positive affect, respectively. Relationship-contingent self-esteem and fear of being single were each negatively related to state self-esteem (most notably overall and social state self-esteem), as well as moderately related to

⁴ Because condition assignment may have impacted correlations between dependent variables, bivariate correlations for each of the six experimental groups are also provided in Appendix E.

negative, but not positive, affect. Finally, trait self-esteem had the strongest correlations with the dependent variables. In particular, trait self-esteem had strong positive correlations with each the state self-esteem variables, a moderate positive correlation with positive affect, and a moderate negative correlation with negative affect.

Table 3

Bivariate Correlations Between Variables (N = 222).

Measure	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.24**	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.47**	-.10	--	--	--	--	--	--	--
4. Fear of Being Single	.51**	.19*	.46**	--	--	--	--	--	--
5. Social Comparison Orientation	.35**	-.02	.47**	.43**	--	--	--	--	--
6. Trait Self-Esteem	-.50**	-.37**	-.29**	-.38**	-.29**	--	--	--	--
7. Negative Affect	.21**	-.01	.22**	.22**	.12	-.23**	--	--	--
8. Positive Affect	-.16*	-.31**	-.03	-.09	.02	.38**	-.04	--	--
9. Overall State Self-Esteem	-.54**	-.21**	-.35**	-.42**	-.31**	.66**	-.48**	.41**	--
10. Social State Self-Esteem	-.51**	-.20**	-.40**	-.40**	-.35**	.59**	-.41**	.33**	.89**

Note: * $p < .05$, ** $p < .01$

Impact of viewing romantic content on state self-esteem. The primary goal of this study was to examine whether, in contrast to online neutral content, online romantic

content incites negative consequences (operationalized as lower state self-esteem and lower mood) for viewers external to the viewed relationship. Further, I wanted to explore whether this varies as a function of continuous individual difference variables (attachment anxiety in particular), and how optimistic/pessimistic viewers are about their own romantic relationship prospects. I chose to focus on the dependent variables separately, looking first at state self-esteem. Given the inherently social nature of Facebook, social state self-esteem stands as the primary state self-esteem measure of interest in the current study, and thus used as a dependent variable. Overall state self-esteem was also analyzed as a dependent variable. Consequently, two separate general linear models were conducted, one with overall state self-esteem scores specified as the dependent variable, and the other with social state self-esteem. In each of these models, there were two categorical independent variables (social comparison condition and pessimism manipulation), as well as one centered continuous independent variable (attachment anxiety). All main effects and interactions were included. Trait self-esteem was specified as a covariate.

Overall state self-esteem. Overall state self-esteem scores are an aggregate of appearance, performance, and social state self-esteem.

Main effects. With overall state self-esteem as the dependent variable, a significant main effect of attachment anxiety emerged, $F(1, 188) = 18.05, p < .001$. Specifically, higher attachment anxiety was associated with lower overall state self-esteem, $B = -.28$, which is consistent with prior work (Roberts et al., 1996). There were no main effects of social comparison condition or pessimism manipulation.

Interactions. No two-way interactions emerged as statistically significant. My primary prediction was that a three-way interaction among social comparison condition, manipulated pessimism for future relationships, and attachment anxiety would emerge. This effect was found to be marginally significant, $F(2, 188) = 2.59, p = .078$. Although the interaction was marginally significant, it was further decomposed to explore whether trends were consistent with hypotheses. Consequently, the data was split by social comparison condition. In the romantic social comparison condition, a two-way interaction between pessimism manipulation and attachment anxiety was statistically significant, $F(2, 93) = 3.10, p = .050$. Specifically, among participants in the pessimistic condition, those with high attachment anxiety reported lower state self-esteem than those with low attachment anxiety ($B = -.24, SE = .06, p < .001$). Similarly, among participants in the optimistic condition, those with high attachment anxiety reported lower state self-esteem than those with low attachment anxiety ($B = -.26, SE = .07, p < .001$). In contrast, among participants in the control condition, there was no relationship between attachment anxiety and state self-esteem ($B = -.04, SE = .07, p = .546$). In the neutral social comparison condition, however, the two-way interaction did not reach statistical significance, $F(2, 94) = 1.39, p = .254$. These findings are somewhat consistent with hypotheses as they suggest that only after viewing online romantic content does a relationship emerge between participants' manipulated pessimism for future relationships and attachment anxiety. However, this finding deviates from hypotheses in that no differences were observed between the optimistic and pessimistic conditions.

Figure 1 below serves as a graphical representation of the three-way interaction. Each simple slope is representative of the strength of the relationship between attachment

anxiety and overall state self-esteem for a given manipulated pessimism condition. Panel A graphs the simple slopes of the romantic social comparison condition (wherein the two-way interaction between attachment anxiety and pessimism manipulation was significant), while Panel B graphs the simple slopes of the neutral condition.

Panel A

Panel B

Figure 1. Overall state self-esteem: Simple slopes of social comparison condition, manipulated pessimism for future relationships, and attachment anxiety

Social state self-esteem. This type of state self-esteem relates to interpersonal circumstances and how an individual might be perceived by others. I expected the results of this model to mirror that of the one described above, given that social state self-esteem is incorporated into overall state self-esteem. However, I did hypothesize that the effect would be stronger in the current model, as the influence of appearance and performance state self-esteem (which are largely irrelevant to interpersonal relationships) are now eliminated.

Main effects. With social state self-esteem as the dependent variable, a significant main effect of attachment anxiety emerged, $F(1, 188) = 17.44, p < .001$. Specifically, participants with higher attachment anxiety reported lower social state self-esteem relative to those with lower attachment anxiety ($B = -.38, SE = .10, p < .001$), which is consistent with prior work (Roberts et al., 1996). This is also consistent with results found when overall state self-esteem was specified as the dependent variable.

Interactions. A marginal two-way interaction between social comparison condition and pessimism manipulation, $F(2, 188) = 2.41, p = .092$. This interaction is such that among participants in the romantic social comparison condition, higher self-esteem scores were reported by participants in the control condition ($M = 3.73, SD = .69$), relative to those in the pessimistic ($M = 3.42, SD = .85$) and optimistic ($M = 3.24, SD = .81$) conditions. Among participants in the neutral social comparison, self-esteem scores were similar between the optimistic ($M = 3.47, SD = .83$), pessimistic ($M = 3.40, SD = .77$), and control ($M = 3.35, SD = .85$) conditions.

However, the marginal two-way interaction was qualified by a marginally significant three-way interaction among social comparison condition, pessimism

manipulation, and attachment anxiety, $F(2, 188) = 2.75, p = .067$. Although the interaction was marginally significant, it was further decomposed to explore whether trends were consistent with hypotheses. Consequently, the data was split by social comparison condition. In the romantic social comparison condition, a two-way interaction between manipulated pessimism for future relationships and attachment anxiety was statistically significant, $F(2, 93) = 4.75, p = .011$. Specifically, among participants in the pessimistic condition, those with high attachment anxiety reported lower social state self-esteem than those with low attachment anxiety ($B = -.32, SE = .08, p < .001$). A similar pattern was observed among participants in the optimistic condition, with those higher in attachment anxiety reporting lower social state self-esteem than those with low attachment anxiety ($B = -.36, SE = .09, p < .001$). Among participants in the control condition, there was no relationship between attachment anxiety and social state self-esteem ($B = -.01, SE = .10, p = .925$). In the neutral social comparison condition, however, the two-way interaction did not reach statistical significance, $F(2, 94) = .30, p = .743$. Of note, these findings are similar to those observed with overall state self-esteem as the dependent variable, albeit slightly stronger here. This was expected, given that social state self-esteem more explicitly relates to interpersonal relationships than does overall state self-esteem.

Figure 2 below serves as a graphical representation of the three-way interaction. Each simple slope is representative of the strength of the relationship between attachment anxiety and social state self-esteem for a given manipulated pessimism condition. Panel A graphs the simple slopes of the romantic social comparison condition (wherein the two-way interaction between attachment anxiety and pessimism manipulation was

significant), while Panel B graphs the simple slopes of those in the neutral social comparison condition.

Panel A

Panel B

Figure 2. Social state self-esteem: Simple slopes of social comparison condition, manipulated pessimism for future relationships, and attachment anxiety

Impact of viewing romantic content on affect. Affect was also explored as a dependent variable in this study. I investigated whether the extent to which affect was impacted varies as a function of whether romantic content was viewed, continuous individual difference variables (attachment anxiety in particular), and whether participants were primed to be pessimistic or optimistic about their future romantic prospects. Two separate general linear models were conducted, one with negative affect scores specified as the dependent variable, and the other with positive affect. In each of these models, there were two categorical independent variables (social comparison condition and manipulation of pessimism for future relationships), as well as one centered continuous independent variable (attachment anxiety). All main effects and interactions were included. Trait self-esteem was specified as a covariate.

Negative affect. Higher levels of negative affect and mood are expected of individuals with high attachment anxiety, who are in the romantic social comparison condition, and primed to be pessimistic about the likelihood they will find their own partner (as opposed being optimistic, or not being primed at all).

Main effects. No main effects emerged as significant.

Interactions. A significant two-way interaction between social comparison condition and attachment anxiety emerged, $F(1, 188) = 4.09, p = .044$, such that among those in the romantic social comparison condition, participants with high attachment anxiety reported higher levels of negative affect than those with low attachment anxiety ($B = 2.2, SE = .83, p = .009$), although this relationship between attachment anxiety and negative affect was not present in the neutral social comparison condition ($B = .11, SE = .65, p = .873$).

However, the two-way interaction was qualified by a significant three-way interaction among social comparison condition, pessimism manipulation, and attachment anxiety, $F(2, 188) = 3.18, p = .044$. To decompose this interaction, the data was split by social comparison condition. In the romantic social comparison condition, a two-way interaction between manipulated pessimism for future relationships and attachment anxiety was statistically significant, $F(2, 93) = 3.14, p = .048$. Specifically, among participants in the pessimistic condition, those with high attachment anxiety reported higher levels negative affect than participants with low attachment anxiety ($B = 1.70, SE = .81, p = .038$). A similar pattern was observed among participants in the optimistic condition, with those higher in attachment anxiety reporting higher negative affect than those lower in attachment anxiety ($B = 2.01, SE = .87, p = .022$). In contrast, among participants in the control condition, there was a no significant relationship between attachment anxiety and negative affect ($B = -.79, SE = .94, p = .406$). In the neutral social comparison condition, however, the two-way interaction did not reach statistical significance, $F(2, 94) = .92, p = .403$. These findings mirror those found with state self-esteem and are thus somewhat consistent with original hypotheses. However, there is again deviation from hypotheses in that no differences were observed between the optimistic and pessimistic conditions.

Figure 3 below serves as a graphical representation of the three-way interaction. Each simple slope is representative of the strength of the relationship between attachment anxiety and negative affect for a given manipulated pessimism condition. Panel A graphs the simple slopes of the romantic social comparison condition (wherein the two-way interaction between attachment anxiety and pessimism manipulation was statistically

significant), while Panel B graphs the simple slopes of those in the neutral social comparison condition.

Panel A

Panel B

Figure 3. Negative affect: Simple slopes of social comparison condition, manipulated pessimism for future relationships, and attachment anxiety

Positive affect. Lower levels of positive affect and mood are expected of individuals with high attachment anxiety, who are in the romantic social comparison condition, and primed to be pessimistic about the likelihood they will find their own partner (in comparison being optimistic, or not being primed at all).

Main effects. No main effects emerged as significant.

Interactions. No two-way interactions emerged as statistically significant. In the same way, the three-way interaction between social comparison condition, manipulated pessimism for future relationships, and attachment anxiety did not meet statistical significance, $F(2, 188) = 2.56, p = .111$. This finding suggests that self-reported levels of positive affect did not differ as a function of social comparison condition, participants' level of pessimism about their own romantic prospects, and attachment anxiety.

Impressions of and attitudes towards object of comparison. I predicted that participants may derogate the viewed individual in order to preserve their own self-esteem, which would hypothetically have been negatively impacted by upward romantic social comparison.

Factor analysis. The 10 adjective items (each of which were rated for applicability to the female individual presented in the viewed photographs) were examined with exploratory factor analysis (maximum likelihood model), in order to distill the 10 items into broad dimensions/factors. Direct Quartimin oblique rotation was requested, given the hypothesized correlation between factors. Use of both a scree plot and an eigenvalue cut-off of 1.0 supported a three-factor solution. Factor loadings and communalities are shown below in Table 4. No complex variables were noted, in that

each variable only loaded strongly (i.e., above a loading value of .3) to a single factor.

The first factor, comprising the items Warm, Likeable, and Kind, was labelled “Warmth” ($\alpha = .80$). The second factor, comprising the reverse-scored items Vain, Conceited, Fake, Smug, and Attention-Seeking, was labelled “Humility” ($\alpha = .74$). Finally, the third factor, comprising the items Smart and Hard-working, was labelled “Competence” ($\alpha = .76$).

Correlations between these three extracted factors are provided in Table 5.

Table 4

Factor loadings and communalities based on maximum likelihood factor analysis with oblique rotation (N = 220)

Item	Warmth	Humility	Competence	Communality
Warm	.76			.57
Vain (R)		.67		.51
Conceited (R)		.73		.50
Smart			.97	.99
Fake (R)		.43		.35
Hard-working			.54	.42
Smug (R)		.51		.29
Likeable	.70			.57
Attention-seeking (R)		.65		.46
Kind	.76			.62

Note: Factor loadings < .3 are not presented

Table 5

Correlations Between Extracted Factors.

	1	2	3
1. Warmth	--	--	--
2. Humility	.29**	--	--
3. Competence	.45**	.23**	--

Note: * $p < .05$, ** $p < .01$

Subsequently, 3 variables were created (warmth, humility, and competence) by averaging the scores of items that loaded onto each of the 3 factors. Means and standard deviations of these scores for all participants collapsed across experimental groups, as well as for each experimental group, are provided in Table 6.

Table 6

Means of Warmth, Humility, and Competence Ratings.

Measure	Warmth	Humility	Competence
Entire sample ($N = 221$)	$M = 4.17$ $SD = 0.66$	$M = 4.69$ $SD = 0.43$	$M = 3.37$ $SD = 0.78$
Optimistic Condition by Romantic Condition ($n = 36$)	$M = 4.37$ $SD = 0.50$	$M = 4.81$ $SD = 0.31$	$M = 3.42$ $SD = 0.83$
Optimistic Condition by Neutral Condition ($n = 37$)	$M = 4.18$ $SD = 0.44$	$M = 4.70$ $SD = 0.41$	$M = 3.31$ $SD = 0.67$
Pessimistic Condition by Romantic Condition ($n = 37$)	$M = 4.19$ $SD = 0.66$	$M = 4.62$ $SD = 0.49$	$M = 3.26$ $SD = 0.75$
Pessimistic Condition by Neutral Condition ($n = 39$)	$M = 4.01$ $SD = 0.91$	$M = 4.63$ $SD = 0.47$	$M = 3.32$ $SD = 0.88$
Control Condition by Romantic Condition ($n = 37$)	$M = 4.04$ $SD = 0.81$	$M = 4.67$ $SD = 0.49$	$M = 3.50$ $SD = 0.85$
Control Condition by Neutral Condition ($n = 35$)	$M = 4.23$ $SD = 0.43$	$M = 4.69$ $SD = 0.38$	$M = 3.40$ $SD = 0.66$

Preliminary analyses of these variables revealed that warmth and humility had moderate negative skews. As a consequence, transformations were employed to normalize these two variables. However, because analyses with these transformed

variables did not differ substantially from using the original variables, the following results report statistics associated with the latter. These variables were then used as dependent variables in separate GLMs. I hypothesized that, if the self-esteem of participants were threatened by viewing the online romantic content, then they may derogate the individual whose content they viewed. Given this, I expected that social comparison condition, manipulated pessimism for future relationships, and attachment anxiety (variables I hypothesized would predict reduced state self-esteem and mood) would also predict the extent to which participants harbour negative impressions of the viewed individual—which, in the current study, would manifest as lower warmth, humility, and competence ratings.

Warmth. A GLM was run with warmth identified as the dependent variable, social comparison condition and pessimism manipulation as two categorical independent variables, and attachment anxiety as a continuous independent variable. All main effects and interactions were included in the model. Trait self-esteem was added as a covariate.

In this model, a significant main effect of attachment anxiety emerged, $F(1, 187) = 4.65, p = .032$. Specifically, higher attachment anxiety was associated with rating the female individual as being higher in warmth, in contrast to lower attachment anxiety, which is contrast with expectations.

No interactions (either two-way or three-way) emerged as being significant. This suggests that the extent to which participants viewed the female individual as being a warm person did not differ as a function of social comparison condition, manipulated pessimism for future relationships, and attachment anxiety.

Humility. A GLM was run with humility identified as the dependent variable, social comparison condition and manipulated pessimism for future relationships as two categorical independent variables, and attachment anxiety as a continuous independent variable. All main effects and interactions were included in the model. Trait self-esteem was added as a covariate.

In this model, no main effects emerged as significant. Similarly, no two-way interactions emerged. However, the three-way interaction between social comparison condition, pessimism manipulation, and attachment anxiety was significant, $F(2, 187) = 3.43, p = .035$. To decompose this interaction, the data was split by social comparison condition. In the romantic social comparison condition, a two-way interaction between manipulated pessimism for future romantic relationships and attachment anxiety was statistically significant, $F(2, 93) = 3.42, p = .037$. Specifically, among participants in the pessimistic condition, those with high attachment anxiety rated the female as having more humility than those with low attachment anxiety ($B = .18, SE = .06, p = .006$). However, there was no relationship between attachment anxiety and humility ratings for the control ($B = .10, SE = .08, p = .191$) or optimistic ($B = -.05, SE = .07, p = .431$) conditions. In the neutral social comparison condition, the two-way interaction between attachment anxiety and pessimism manipulation did not reach statistical significance, $F(2, 95) = 1.12, p = .331$.

Figure 4 below serves as a graphical representation of the three-way interaction. Each simple slope is representative of the strength of the relationship between attachment anxiety and humility rating for a given manipulated pessimism condition. Panel A graphs the simple slopes of the romantic social comparison condition (wherein the two-way

interaction between attachment anxiety and pessimism manipulation was significant), while Panel B graphs the simple slopes of those in the neutral social comparison condition.

Panel A

Panel B

Figure 4. Humility ratings: Simple slopes of social comparison condition, manipulated pessimism for future relationships, and attachment anxiety

Competence. A GLM was run with competence identified as the dependent variable, social comparison condition and pessimism manipulation as two categorical independent variables, and attachment anxiety as a continuous independent variable. All main effects and interactions were included in the model. Trait self-esteem was added as a covariate.

In this model, no main effects emerged as significant. Similarly, no interactions (either two-way or three-way) emerged as being significant. This suggests that the extent to which participants viewed the female individual as being a competent person did not differ as a function of social comparison condition, participants' manipulated pessimism about their own romantic prospects, and attachment anxiety.

Discussion

The results collected in Study One provide preliminary evidence in support for my hypotheses. I had predicted that certain single individuals would be negatively affected by viewing romantic (as opposed to neutral) content online, and that this would be impacted by individuals' attachment anxiety, and whether they were pessimistic or optimistic about their own romantic prospects. The results presented above indeed suggest that this may be the case: three-way interactions (in particular, for overall state self-esteem, social state self-esteem, and negative affect) indicate that there is a difference between participants' reactions to viewing romantic content and neutral content. Although it must be recognized that the three-way interactions for the two state self-esteem measures were marginal, the trends observed appear to tell a clear story. In particular, only when viewing romantic online content was there a relationship between

attachment anxiety and individuals' manipulated pessimism about their own future relationships. This relationship was such that lower overall and social state self-esteem scores and higher negative affect scores were reported by those in the romantic social comparison condition who were in high attachment anxiety, and who were primed to believe that it should be either easy or difficult (optimistic or pessimistic) to find their own partners. This is in contrast to the state self-esteem and negative affect scores reported by those in the neutral social comparison condition, or those in the romantic social comparison condition who were not at all primed (control) about their romantic prospects.

However, the results also deviated from my hypotheses in several respects. First, although I predicted that participants' manipulated pessimism would indeed interact with social comparison condition and attachment anxiety, I predicted that those who were told that it would be difficult to find their own partner—and thus pessimistic about their own prospects—would be the most negatively impacted, relative to those who were told it would be easy (optimistic), or those in the control condition. Instead, I found no significant differences between the reactions of those in the pessimistic and optimistic conditions. This can perhaps be attributed to participants' interpretations of the article prime, most notably in the optimistic condition. Although I predicted that participants would be encouraged if told that it should be easy for them to find their own romantic partners, it is likely that the opposite effect took place: the article may have highlighted a disparity between these participants' singleness and the alleged ease of finding a partner, and thus have been disheartening. Indeed, the thought that they are still single despite how easy it should be to find a partner may have discouraged these participants. Such a

fear was perhaps exacerbated for those high in attachment anxiety, a population for whom relationship insecurities are already high (Brennan & Shaver, 1995; Campbell, Simpson, Boldry, & Kashy, 2005; Hazan & Shaver, 1987; Simpson, 1990). In moving forward, I should add a supplementary questionnaire to ensure that the manipulation worked as expected. In the study in which this article manipulation was previously used, researchers did indeed employ a manipulation check: participants were asked to summarize the content of the article they viewed (Spielmann, MacDonald, & Wilson, 2009). However, beyond doing this, it would be prudent to ask participants the extent to which they believed the article held true for them.

A second deviation from our hypotheses was that no interactions with positive affect as a dependent variable emerged as significant. This suggests that lower positive affect was not a consequence associated with viewing romantic online content, and this did not vary as a function of participants' attachment anxiety or how optimistic/pessimistic they were about their own romantic prospects. However, this finding is not altogether surprising given that, in contrast to the correlations among all other variables, the relationships between positive affect and each of the dependent and independent variables were quite small. Further, upon re-inspection of the PANAS, it is notable that the positive affect subscale comprises items such as "interested", "alert", and "attentive"; which appear to have low face validity. Indeed, it seems very much possible that feeling alert and attentive can be intertwined with negative emotions (i.e., fear), and are thus not necessarily representative of positive affect.

Third, my hypothesis that participants may derogate the viewed female individual in an attempt to either preserve or bolster their own self-concepts was largely

unsupported. This may have in part been the result of the stimuli chosen; the female individual presented in the photographs generally appears to be wholesome and non-threatening. Regardless, one notable finding emerged, suggesting that in the romantic social comparison condition (but not the neutral condition), participants differentially rated the female individual's perceived humility as a function of their own attachment anxiety and manipulated pessimism for future relationship. In particular, for those in the pessimistic condition, higher attachment anxiety was related to rating the individual as having more humility. However, because such a finding was so contrary to expectations, it would be prudent to replicate this finding prior to drawing conclusions.

Everything considered, Study One provides evidence in support of the claim that, for some individuals, viewing others' romantic content on SNSs such as Facebook can be detrimental. However, this study relates only to those who are single. Indeed, one of the key predictors—how optimistic or pessimistic individuals are that they themselves will find a partner—is a variable relevant only to single individuals. Considering that because dating individuals, too, use Facebook, investigation of how this population of users might react to online romantic content is important. Not only does there exist a possibility that negative effects discovered in this current study (i.e., lower self-esteem and mood) pertain also to dating individuals, but consider that online romantic social comparison might also yield consequences on the viewers' own relationships as well.

Chapter 3

Study Two

In Study One, I focused exclusively on single individuals, with the rationale that online romantic social comparison would vary greatly between dating and single individuals. In Study Two, dating individuals were instead the focus of my investigation. Dating individuals present a more complex scenario, as comparisons drawn would more strongly relate to the quality of the viewer's relationship—as opposed to merely the presence or absence of a romantic partner, as with single individuals. For example, it seems to logically follow that an individual feeling insecure about her own relationship would be more vulnerable to the negative effects associated with upward romantic social comparison, in contrast to an individual who feels secure in her relationship, without threat of rejection. Consequently, the presence/absence of rejection threat in participants' own romantic relationships is a variable of interest unique to Study Two.

The principles and objectives underlying this study otherwise very much mirrored that of Study One: I sought to determine whether a subset of individual difference variables (attachment orientation, relationship-contingent self-esteem, fear of being single, social comparison orientation, and trait self-esteem) may be related to experiencing negative consequences when confronted with online romantic content. This study followed a 2 (social comparison condition: neutral or romantic) by 2 (relationship threat: experimental or control) design. The relationship threat condition was incorporated in order to investigate whether introducing a threat into an individual's dating relationship will affect the extent to which viewing romantic content of another happy couple will have negative consequences on said individual. Negative consequences

were again operationalized as being lower mood and state self-esteem, and online romantic content as photographs of a happy couple taken from Facebook.

Participants

Participants were 139 female undergraduate students attending Queen's University and enrolled in a first-year introductory psychology course. Average participant age was 18.20 years ($SD = 0.75$). To be eligible for the study, participants had to self-report to be dating, either via email prior to participation, or upon arrival to the lab. Participants received either extra course credit or monetary compensation.

Of the 139 participants who participated, a total of 121 were included in analyses. As in Study One, 4 participants were excluded because they had not completed the prescreening battery of questionnaires. This battery is administered at the beginning of the school year to all students enrolled in the introductory psychology course, and comprises a variety of standardized measures—several of which were crucial in the current study. The remaining 14 participants were excluded from analyses because, as per their responses on the hard-copy debrief questionnaire, they were either able to guess the hypotheses of the study, or indicated that they did not believe the results of the rejection threat manipulation. The same rationale for recruiting only female participants in Study One applied also to the current study.

Procedure and Measures

Prescreening measures. At the beginning of the school year, students filled out the prescreening battery of questionnaires, which included measures of attachment

anxiety (ECR-R; $\alpha = .92$), trait self-esteem (RSE; $\alpha = .88$), relationship-contingent self-esteem (Relationship-Contingent Self-Esteem Scale; $\alpha = .86$), fear of being single (Fear of Being Single Scale; $\alpha = .86$), and tendency to engage in social comparison (Scale for Social Comparison Orientation; $\alpha = .87$). These are the same scales as were administered in Study One, and are described above. See Appendix B to see all scales in their entirety.

Ethics. Upon arrival to the lab, participants' dating status was confirmed, and they were provided with a letter of information and consent form to sign (Appendix A), both of which were presented electronically via SurveyMonkey. This study was introduced to participants as being two separate and shorter studies, placed in the same session to maximize use of the allocated timeslots. This was done to minimize opportunities for participants to correctly guess what my hypotheses were.

Rejection threat manipulation. Participants were randomly assigned to either the experimental or control rejection threat condition, with assignment determining whether they were subject to a manipulation designed to prime rejection threat. Assignment was randomized by means of an online program (www.randomizer.org) that generated multiple sets of numbers, where each set comprised a fixed amount of numbers in random sequence. Each number was associated with a specific condition. Consequently, participants were assigned to the next available condition in the generated sequence. Those in the experimental condition were led to believe that their romantic partner harboured complaints about certain aspects of their behaviour or personality, and that such complaints often lead to major conflict in the relationship. In order to achieve this, a fabricated questionnaire entitled the "Interpersonal Behaviors Inventory" (adopted from Murray, Rose, Bellavia, Holmes, & Kusche, 2002) was utilized. Prior to

commencing these questionnaires, participants were told that their first task was to help the lab develop and validate a new measure by completing an interactive questionnaire investigating interactions between romantic partners. Participants in the experimental condition were further advised that enough data has been collected such that the program will be able to score participants' answers and provide immediate feedback, while the control condition did not receive any feedback.

The contents of the Interpersonal Behaviors Inventory differed between the experimental and control conditions, with those in the former receiving more questions that pertained to potential concerns or annoying habits that the participant's partner might find irritating about them. For example, some included items were: "How often does our partner ask you to stop doing something?", and "How often does your partner look a bit irritated or frustrated with your behaviour?". The remaining items inquired about the frequency with which a participant's partner was affectionate—the experimental condition received fewer of these items in contrast to the control condition. Furthermore, the items on the inventory of those in the experimental condition were answered on an altered Likert scale that encouraged skewed responses. For example, possible responses for questions inquiring about partner affection was capped at "a few times a month" for those in the experimental condition, while the highest possible response for the control condition was "once or more a day".

After participants completed the questionnaire, results were displayed on screen for those in the experimental condition only (see Appendix C). This feedback was bogus and claimed that, based on their responses, it was probable that their partners harboured

unspoken complaints about them—thus putting their relationship at high risk of ending due to conflict. Individuals in the control condition did not receive any feedback.

Social comparison condition (photographs). After completing the Interpersonal Behaviors Inventory, participants were advised that they would be moving onto a second, unrelated study concerning social media use. It was explained that they were to view personal photographs taken from a female individual's Facebook profile—as in the preceding study. Again, photographs to be viewed were determined via random assignment to a social comparison condition. All participants viewed 10 photographs of the same female individual, of which five photographs (depicting the individual with platonic friends) were viewed by both groups. However, those in the romantic condition viewed an additional five photographs of the individual with her boyfriend, while those in the neutral condition instead viewed five photographs of the individual by herself.

In-lab questionnaires. Participants then completed several questionnaires pertaining to their current mood, state self-esteem, fear of being single, and their impressions of the female whose pictures they viewed. To measure these constructs, the same questionnaires as those used in study one were administered: PANAS (negative affect, $\alpha = .84$; positive affect, $\alpha = .89$), SSES (overall state self-esteem, $\alpha = .91$; social self-esteem, $\alpha = .86$), and a scale that I constructed comprising 10 adjectives along which participants rated the female individual. However, participants in the current study further completed the *Relationship Ambivalence Scale* ($\alpha = .78$), in order to measure the strength of and satisfaction of participants' relationships. This scale comprises ten items selected from a 28-item Relationships Questionnaire developed to assess various aspects of dating relationships (MacDonald & Ross, 1999). An example of such an item is: "I am

serious about the current dating relationship”. For each, participants rated the extent to which they believed the statement was true of themselves, on a scale ranging from 1 (*not true at all*) to 5 (*completely true*). Following completion of the questionnaires, participants were given a hard-copy debrief questionnaire, inquiring about what participants suspected the study might have been about, and whether (if applicable) they found the fabricated results of the Interpersonal Behaviors Inventory believable. Finally, participants were fully debriefed and further provided a debrief form (Appendix A).

Results

Data analytic strategy. Data analysis for Study Two closely followed that of Study One, and thus entailed several generalized linear models (GLMs), with a model for each of the dependent variables of interest: overall state self-esteem, social state self-esteem, negative affect, positive affect, and impressions of the female individual viewed. However, in Study Two, I was also interested in relationship satisfaction as a dependent variable. For all models, two categorical independent variables were identified: social comparison condition (neutral or romantic) and rejection threat manipulation (experimental or control). Attachment anxiety (centered) was identified as a continuous independent variable. All main effects and all possible interactions were included in each model. As before, trait self-esteem (centered) was added as a covariate. Significant three-way interactions were decomposed by splitting the dataset according to the dichotomous social comparison condition variable. GLMs were again run for the two split datasets, to assess for the presence and significance of any two-way interactions.

Preliminary analyses. Prior to conducting inferential statistics, preliminary analyses were conducted on the dataset. This revealed that trait self-esteem—one of the continuous predictor variables collected during prescreening and prior to lab participation—was not equally distributed across the two social comparison conditions, despite the fact that randomized condition assignment was computer-generated. In particular, there was a significant difference between the trait-self-esteem scores for the neutral condition ($M = 5.23$, $SD = 1.18$) and romantic condition ($M = 4.75$, $SD = 1.23$); $t(119) = -2.16$, $p = .03$. Given that trait self-esteem is a construct deeply entrenched in and related to other variables of interest in this study, it was prudent to control for the significant difference. As such, all the more reason was given to continue including trait self-esteem as a covariate in all subsequent GLMs, in order to parse out the main effect of the variable. Further, after carefully comparing the distributions of trait self-esteem scores for each of the neutral and romantic conditions, I decided to remove the three most extreme scores, effectively restricting the range such that it spanned 2.1 to 6.8, whereas it had originally spanned 1 to 7. In doing so, 9 participants were removed from the analyses: 5 with the highest trait self-esteem scores, and 4 with the lowest self-esteem scores.⁵ These 9 participants were found to be equally distributed across the 4 cells. Following the removal of these extreme scores, the difference between trait self-esteem scores for the neutral ($M = 5.18$, $SD = 1.00$) and romantic conditions ($M = 4.89$, $SD = .99$) was no longer significant, $t(110) = -1.58$, $p = .12$.

Further, descriptive properties of variables were assessed. The presented data in Table 7 suggests that two variables were not normally distributed: negative affect had a

⁵ Including these 9 participants included did not substantially alter findings or interpretation of results.

large positive skew, while relationship satisfaction had a moderate negative skew. In regards to the former, PANAS scale creators have indicated that a positively skewed negative affect distribution is typical, and that mean scores should be approximately 14.8 ($SD = 7.2$). The current sample is consistent with this. Nonetheless, log transformations were performed on both the negative affect and relationship satisfaction variables to reduce the skew of each. Because subsequent analyses using these transformed variables did not change results substantially, the following sections document results observed using the unaltered variables. Additionally, given hypothesized influences of condition assignment on dependent variables, means and standard deviations for each experimental group have also been provided (Table 8).

Table 7

Descriptive Statistics of Independent and Dependent Variables.

Measure	<i>M</i>	<i>SD</i>	<i>n</i>	Range	Skew	Kurtosis
Attachment Anxiety	3.30	1.10	112	1 - 7	.21	-.54
Attachment Avoidance	2.61	1.04	111	1 - 7	.51	-.66
Relationship-Contingent Self-Esteem	4.94	0.97	87	1 - 7	-.16	-.50
Fear of Being Single	3.41	1.44	88	1 - 7	.05	-.67
Social Comparison Orientation	4.55	0.94	105	1 - 7	-.04	.18
Trait Self-Esteem	5.04	1.00	112	2.1 - 6.8	-.38	-.47
Negative Affect	15.79	5.28	111	10 - 50	1.29	1.42
Positive Affect	27.17	8.14	112	10 - 50	.04	-.73
Overall State Self-Esteem	3.54	0.58	112	1 - 5	-.32	-.65
Social State Self-Esteem	3.53	0.75	112	1 - 5	-.17	-.89
Relationship Satisfaction	4.08	0.61	112	1 - 5	-.91	.07

Table 8

Means of Dependent Variables by Experimental Group.

Measure	Negative Affect	Positive Affect	Overall State Self-Esteem	Social State Self-Esteem	Relationship Satisfaction
Rejection Threat by Romantic Condition (<i>n</i> = 27)	<i>M</i> = 15.19 <i>SD</i> = 5.00	<i>M</i> = 28.22 <i>SD</i> = 7.64	<i>M</i> = 3.46 <i>SD</i> = 0.63	<i>M</i> = 3.52 <i>SD</i> = 0.75	<i>M</i> = 4.16 <i>SD</i> = 0.59
Rejection Threat by Neutral Condition (<i>n</i> = 37)	<i>M</i> = 15.23 <i>SD</i> = 5.52	<i>M</i> = 27.50 <i>SD</i> = 10.09	<i>M</i> = 3.60 <i>SD</i> = 0.57	<i>M</i> = 3.62 <i>SD</i> = 0.76	<i>M</i> = 4.15 <i>SD</i> = 0.58
No Threat by Romantic Condition (<i>n</i> = 37)	<i>M</i> = 17.67 <i>SD</i> = 5.11	<i>M</i> = 26.81 <i>SD</i> = 6.88	<i>M</i> = 3.41 <i>SD</i> = 0.53	<i>M</i> = 3.34 <i>SD</i> = 0.75	<i>M</i> = 3.92 <i>SD</i> = 0.64
No Threat by Neutral Condition (<i>n</i> = 40)	<i>M</i> = 15.15 <i>SD</i> = 4.63	<i>M</i> = 26.14 <i>SD</i> = 7.39	<i>M</i> = 3.69 <i>SD</i> = 0.59	<i>M</i> = 3.66 <i>SD</i> = 0.73	<i>M</i> = 4.10 <i>SD</i> = 0.64

Correlation analyses. Bivariate correlations between each of the variables are presented in Table 9 below.⁶ Generally, correlations among the independent individual difference variables ranged from moderate to strong, with the exception of attachment avoidance, which had weak correlations with all variables save for trait self-esteem and negative affect. The strongest correlation between independent variables was observed between attachment anxiety and trait self-esteem, $r(111) = .55, p < .001$, and the smallest correlation (barring those with attachment avoidance) was between fear of being single

⁶ Because manipulation/condition assignment may have impacted correlations between dependent variables, bivariate correlations for each of the six experimental groups are also provided in Appendix F.

and social comparison orientation, $r(88) = .23, p < .05$. All correlations were in the expected direction, with positive correlations among attachment anxiety, relationship-contingent self-esteem, fear of being single, and social comparison orientation—each of which were negatively correlated with trait self-esteem. In speaking to correlations among dependent variables, social state self-esteem and overall state self-esteem were, as expected, very strongly correlated, $r(111) = .85, p < .001$. Negative and positive affect were moderately related to the state self-esteem scores, and weakly correlated with one another.

Consistent with my hypotheses, attachment anxiety was substantially correlated with various dependent variables. Specifically, attachment anxiety had strong negative correlations with the state self-esteem variables, a weak positive correlation with negative affect, and weak negative correlations with positive affect and relationship satisfaction. Relationship-contingent self-esteem and fear of being single were each negatively related to the two state self-esteem measures, as well as moderately related to negative, but not positive, affect. No significant relationship between these variables and relationship satisfaction emerged. Overall, trait self-esteem had the strongest correlations with the dependent variables. In particular, trait self-esteem had strong positive correlations with the state self-esteem variables, moderate positive correlations with positive affect and relationship satisfaction, and a moderate negative correlation with negative affect.

Table 9

Bivariate Correlations Between Variables (N = 112).

Measure	1	2	3	4	5	6	7	8	9	10
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.42**	--	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.42**	-.15	--	--	--	--	--	--	--	--
4. Fear of Being Single	.53**	.14	.29**	--	--	--	--	--	--	--
5. Social Comparison Orientation	.24*	-.10	.56**	.23*	--	--	--	--	--	--
6. Trait Self-Esteem	-.55**	-.29**	-.36**	-.37**	-.24*	--	--	--	--	--
7. Negative Affect	.16	.33**	.06	-.01	.20*	-.23*	--	--	--	--
8. Positive Affect	-.13	-.05	-.10	-.25*	-.05	.32**	.14	--	--	--
9. Overall State Self-Esteem	-.41**	-.17	-.26*	-.28**	-.33**	.64**	-.29**	.39**	--	--
10. Social State Self-Esteem	-.45**	-.21*	-.29**	-.31**	-.38**	.56**	-.25**	.18**	.85**	--
11. Relationship Satisfaction	-.17	-.22*	-.01	-.08	-.06	.23*	-.28**	.26**	.18	.13

*Note: *p < .05, **p < .01*

Impact of viewing romantic content on state self-esteem. The primary goal for Study Two was to examine whether, in contrast to viewing neutral content, viewing romantic content online is associated with negative consequences for viewers external to the viewed relationship, if said viewers are themselves in dating relationships. I wanted to

further explore whether this varies as a function of continuous individual difference variables (attachment anxiety in particular), and the presence/absence of rejection threat in their own romantic relationships.

Overall state self-esteem. Contrary to hypotheses, no significant effects—whether main effects or interactions—were found. Participants’ overall state self-esteem scores were not influenced by their attachment anxiety, social comparison condition, or whether they were subject to rejection threat.

Social state self-esteem. With social state self-esteem as the dependent variable, a significant main effect of attachment anxiety emerged, $F(1, 103) = 4.21, p = .043$. Specifically, participants with higher attachment anxiety reported lower social state self-esteem relative to participants with low attachment anxiety, which was expected. No two-way or three-way interactions were significant in this model.

Impact of viewing romantic content on affect. Affect also explored as a dependent variable in this study. I investigated whether the extent to which mood is impacted varies as a function of whether romantic content is viewed, whether rejection threat was introduced into participants’ own relationships, and participants’ levels of attachment anxiety. Two separate general linear models were conducted, one with negative affect scores specified as the dependent variable, and the other with positive affect. In each of these models, there were two categorical independent variables (social comparison condition and rejection threat condition), and one centered continuous independent variable (attachment anxiety). All main effects and interactions were included. Trait self-esteem was specified as a covariate.

Negative affect. Contrary to hypotheses, no significant effects—main effects or interactions—were found. This suggests that participants’ self-reports of negative affect were not influenced by their attachment anxiety, social comparison condition, or whether they were subject to the rejection threat manipulation.

Positive affect. No main effects or two-way interactions emerged as significant when positive affect was specified as the dependent variable. However, the three-way interaction between attachment anxiety, social comparison condition, and rejection threat condition was marginal, $F(1, 103) = 3.64, p = .059$. To decompose this marginally significant interaction, the data was split by social comparison condition. In the neutral social comparison condition, the two-way interaction between attachment anxiety and rejection threat condition did not reach statistical significance, $F(1, 53) = .45, p = .505$. However, in the romantic social comparison condition, the two-way interaction was statistically significant, $F(1, 49) = 4.60, p = .037$. Specifically, among participants who were in the control condition, those with high attachment anxiety reported higher positive affect than those with low attachment anxiety ($B = 3.11, SE = 1.26, p = .017$). In contrast, among participants in the experimental rejection threat condition, the relationship between positive affect and attachment anxiety was not significant ($B = -.48, SE = 1.29, p = .709$). The direction and strength of the relationship between attachment anxiety and positive affect for the control rejection threat condition is not accounted for by hypotheses.

Figure 5 below serves as a graphical representation of the three-way interaction. Each simple slope is representative of the strength of the relationship between attachment anxiety and positive affect for a specific rejection threat condition. Panel A graphs the

simple slopes of the romantic social comparison condition (wherein the two-way interaction between attachment anxiety and rejection threat condition was significant), while Panel B graphs the simple slopes of those in the neutral social comparison condition.

Panel A

Panel B

Figure 5. Positive affect: Simple slopes of social comparison condition, rejection threat condition, and attachment anxiety

Impact of viewing romantic content on relationship satisfaction. Contrary to hypotheses, no main effects or interactions were found to be significant. Participants' self-ratings of satisfaction and confidence in their own relationships were not influenced by their attachment anxiety, social comparison condition, or whether they were subject to rejection threat.

Impressions of and attitudes towards object of comparison. The 10 adjective items (each of which were rated for applicability to the female individual presented in the photographs viewed) were distilled into 3 broad variables: warmth, humility, and competence. These variables were determined through factor analysis in Study One; I operated under the assumption that these item groupings would pertain also to the current study. Means and standard deviations of these three variables by experimental group, as well as collapsed across groups, are presented below (Table 10).

Table 10

Means of Warmth, Humility, and Competence Ratings.

Measure	Warmth	Humility	Competence
Entire sample ($N = 112$)	$M = 4.21$ $SD = 0.56$	$M = 4.75$ $SD = 0.34$	$M = 3.52$ $SD = 0.67$
Rejection Threat by Romantic Condition ($n = 27$)	$M = 4.26$ $SD = 0.66$	$M = 4.74$ $SD = 0.44$	$M = 3.52$ $SD = 0.74$
Rejection Threat by Neutral Condition ($n = 30$)	$M = 4.16$ $SD = 0.48$	$M = 4.71$ $SD = 0.33$	$M = 3.68$ $SD = 0.50$
No Threat by Romantic Condition ($n = 27$)	$M = 4.35$ $SD = 0.52$	$M = 4.70$ $SD = 0.36$	$M = 3.37$ $SD = 0.73$
No Threat by Neutral Condition ($n = 35$)	$M = 4.08$ $SD = 0.58$	$M = 4.85$ $SD = 0.21$	$M = 3.48$ $SD = 0.70$

Preliminary analyses of these variables revealed that warmth and humility had moderate negative skews. As a consequence, transformations were employed to normalize these two variables. However, because analyses with these transformed variables did not differ substantially from using the original variables, the following results report statistics associated with the latter.

Warmth. A GLM was run with warmth identified as the dependent variable, social comparison condition and rejection threat condition as two categorical independent variables, and attachment anxiety as a continuous independent variable. All main effects and interactions were included in the model. Trait self-esteem was added as a covariate.

In this model, a main effect of social comparison condition emerged as being marginally significant, $F(1, 103) = 3.54, p = .063$, such that participants who viewed romantic content rated the female individual as being warmer ($M = 4.30, SD = .59$) than participants who viewed neutral content ($M = 4.12, SD = .53$). This finding is not consistent with hypotheses that participants might derogate the individual in order to preserve their own self-esteem.

Further, the two-way interaction between rejection threat condition and attachment anxiety was also revealed to be marginally significant, $F(1, 103) = 2.95, p = .089$. This interaction was such that participants who were exposed to rejection threat and who were high in attachment anxiety were more likely to rate the viewed individual as being more warm, relative to those low in attachment anxiety ($B = .20, SE = .11, p = .077$). In contrast, among participants who were not exposed to any rejection threat, there was no significant relationship between warmth ratings and attachment anxiety ($B = -.06, SE = .11, p = .559$). As with the main effect above, this finding is again inconsistent with

hypotheses that participants in the experimental rejection threat condition might derogate the individual in order to preserve their self-esteem.

Humility. A GLM was run with humility identified as the dependent variable, social comparison condition and rejection threat condition as two categorical independent variables, and attachment anxiety as a continuous independent variable. All main effects and interactions were included in the model. Trait self-esteem was added as a covariate.

Contrary to hypotheses, no significant effects were found. Thus, participants' ratings of the viewed individual's humility were not influenced by participants' own attachment anxiety scores, social comparison condition, or whether they were subject to rejection threat.

Competence. A GLM was run with competence identified as the dependent variable, social comparison condition and rejection threat condition as two categorical independent variables, and attachment anxiety as a continuous independent variable. All main effects and interactions were included in the model. Trait self-esteem was added as a covariate.

As with humility, no significant effects were found. This indicates that participants' ratings of the individual's competence were not influenced by participants' own attachment anxiety scores, social comparison condition, or whether they were subject to rejection threat.

Exploratory post-hoc correlation analyses. Given that a majority of the analyses described above resulted in findings inconsistent with hypotheses, post-hoc correlation analyses were conducted. The purpose of conducting such analyses was exploratory in nature; I wanted to assess patterns among the four cells (based on the 2 by 2 design), to see whether small support for my hypotheses may still exist, despite the fact that expected effects in the main analyses did not reach significance. If this exploratory analysis reveals promising patterns, then the current lack of significant findings does not warrant discarding hypotheses altogether. Instead, this would suggest that it is perhaps the case the current methodology simply did not allow for clear investigation of any present effects, or that the effects may be weaker than anticipated. Nonetheless, in such a scenario, future reinvestigation would be warranted.

Consequently, participants were split into four groups based on their assignments to social comparison (romantic or neutral) and rejection threat conditions (experimental or control). Recall that in GLMs described above, 9 participants with the most extreme trait self-esteem scores were excluded because this variable differed significantly across the two social comparison conditions. However, because the current exploratory analysis sought to uncover correlational patterns within groups—as opposed to conducting statistical comparisons across groups—these 9 participants were re-incorporated into the sample. For each group, bivariate correlations between all continuous dependent and independent variables included in the earlier-conducted GLMs were run.

Group 1 (n = 29): Romantic Social Comparison x Rejection Threat. This group comprised participants who viewed online romantic content and who were exposed to rejection threat. According to original hypotheses, these are the participants for whom

negative consequences would most strongly manifest—especially among those high in attachment anxiety.

Correlations are presented in Table 11 below. Notably, negative affect was significantly predicted by attachment anxiety and trait self-esteem. These relationships were strong and in the expected direction, such that higher levels of negative affect related to higher attachment anxiety and lower trait self-esteem. Positive affect was also significantly predicted by trait self-esteem, and marginally by attachment anxiety. Again, the relationships were in the expected direction, with higher levels of positive affect related to lower attachment anxiety, and with higher trait self-esteem.

A very similar picture is painted with the state self-esteem scales. Both overall state self-esteem and social state self-esteem were strongly predicted by attachment anxiety and trait self-esteem. However, neither predicted relationship satisfaction.

Finally, in speaking to participants' impressions of the viewed individual, humility and competence ratings were not significantly correlated with either of the individual difference variables. Warmth, however, was moderately predicted by attachment anxiety and trait self-esteem, although the relationship with trait self-esteem was only marginally significant. These relationships were such that higher ratings of warmth were associated with higher levels of attachment anxiety and lower levels of trait self-esteem. As such, the directions of these correlations are actually contrary to what was expected, given my original hypotheses.

Table 11

Group 1 (n = 29): Bivariate correlations Between Variables

Measure	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--
2. Trait Self-Esteem	-.70**	--	--	--	--	--	--	--	--
3. Negative Affect	.45*	-.51**	--	--	--	--	--	--	--
4. Positive Affect	-.34	.40*	-.08	--	--	--	--	--	--
5. Overall State Self-Esteem	-.56**	.76**	-.57**	.41*	--	--	--	--	--
6. Social State Self-Esteem	-.48**	.60**	-.55**	.23	.87**	--	--	--	--
7. Relationship Satisfaction	.01	.01	-.05	.33	.13	.00	--	--	--
8. Warmth	.37*	-.34	.22	.00	-.18	-.06	.29	--	--
9. Humility	-.02	.16	-.04	-.10	.01	.15	.15	.39*	--
10. Competence	.16	-.28	.13	.22	-.02	.03	.16	.24	.13

*Note: *p < .05, **p < .01*

Group 2 (n = 32): Neutral Social Comparison x Rejection Threat. This group comprised participants who viewed neutral online content (i.e., content void of romantic undertones) and were also exposed to the rejection threat manipulation. According to original hypotheses, these are the participants for whom negative consequences might manifest moderately, but not to the same extent as that of Group 1.

Correlations are presented in Table 12 below. Negative affect was only predicted by trait self-esteem; this relationship was in the expected direction, with higher levels of negative affect associated with lower trait self-esteem. Positive affect had a marginal positive correlation with trait self-esteem, again in the expected direction.

In speaking to state self-esteem, overall state self-esteem and social state self-esteem were both significantly correlated with both attachment anxiety and trait self-esteem, in the expected directions. The strength of the correlations were strong. Neither of the independent variables predicted relationship satisfaction.

In regards to participants' impressions of the viewed individual, warmth and humility ratings were not significantly associated with either of the independent variables. Competence, on the other hand, was strongly correlated with both attachment anxiety and trait self-esteem. Higher competence ratings were associated with higher attachment anxiety and fear of being single, and lower trait self-esteem. As such, the directions of these correlations are actually contrary to what was expected, given hypotheses.

Table 12

Group 2 (n = 32): Bivariate Correlations Between Variables

Measure	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--
2. Trait Self-Esteem	-.69**	--	--	--	--	--	--	--	--
3. Negative Affect	.31	-.45*	--	--	--	--	--	--	--
4. Positive Affect	-.07	.31	.14	--	--	--	--	--	--
5. Overall State Self-Esteem	-.62**	.68**	-.35*	.59**	--	--	--	--	--
6. Social State Self-Esteem	-.74**	.65**	-.41*	.19	.81**	--	--	--	--
7. Relationship Satisfaction	-.18	.12	-.11	.27	.32	.15	--	--	--
8. Warmth	.16	-.26	.10	.30	.14	.01	.27	--	--
9. Humility	-.03	.29	-.30	.09	.19	.29	.09	.06	--
10. Competence	.46**	-.43*	.38*	.22	-.16	-.28	.09	.43*	.03

Note: * $p < .05$, ** $p < .01$

Group 3 (n = 29): Romantic Social Comparison x No Rejection Threat. These participants viewed romantic online content and were not exposed to rejection threat. According to original hypotheses, these are the participants for whom negative consequences might manifest moderately, but not to the same extent as that of Group 1.

Correlations are presented in Table 13 below. Trait self-esteem was not correlated with any of the dependent variables. Attachment anxiety, however, was marginally correlated with overall state self-esteem and social state self-esteem. Consequently, although weak, this correlation is consistent with those seen in Groups 1 and 2. Negative affect, relationship security, and participants' impressions of the viewed individual's warmth, humility, and competence were not correlated with either independent variable.

Table 13

Group 3 (n = 29): Bivariate Correlations Between Variables

Measure	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--
2. Trait Self-Esteem	-.28	--	--	--	--	--	--	--	--
3. Negative Affect	.08	-.08	--	--	--	--	--	--	--
4. Positive Affect	.12	.20	.22	--	--	--	--	--	--
5. Overall State Self-Esteem	-.33	.27	-.11	.39*	--	--	--	--	--
6. Social State Self-Esteem	-.32	.22	.02	.36*	.90**	--	--	--	--
7. Relationship Satisfaction	-.14	.08	-.14	.33	.15	.23	--	--	--
8. Warmth	-.07	.16	.20	.42*	-.03	.02	.16	--	--
9. Humility	-.03	.18	.00	-.21	-.39*	-.28	.03	.45*	--
10. Competence	.00	.20	-.03	.48**	.07	.05	.26	.51**	.19

Note: * $p < .05$, ** $p < .01$

Group 4 (n = 31): Neutral Social Comparison x No Rejection Threat. This group comprised participants who viewed neutral online content (i.e., content void of romantic undertones) and were not exposed to rejection threat. According to original hypotheses, these are the participants who should experience the least negative consequences.

Correlations are presented in Table 14 below. As with Group 3, negative affect was only significantly predicted by trait self-esteem; this relationship was in the expected direction, with higher levels of negative affect associated with lower trait self-esteem. Positive affect had a marginal negative correlation with attachment anxiety.

Both overall and social state self-esteem was negatively correlated with attachment anxiety, as well as positively correlated with trait self-esteem. Relationship satisfaction, however, was not significantly correlated with either independent variable.

Finally, participants' impressions of the viewed individual were similar to relationship satisfaction: they were not significantly related to any of the independent variables. This is similar to what was found in Group 3.

Table 14

Group 4 (n = 31): Bivariate Correlations Between Variables

Measure	1	2	3	4	5	6	7	8	9
11. Attachment Anxiety	--	--	--	--	--	--	--	--	--
12. Trait Self-Esteem	-.63**	--	--	--	--	--	--	--	--
13. Negative Affect	.23	-.38*	--	--	--	--	--	--	--
14. Positive Affect	-.33	.19	.07	--	--	--	--	--	--
15. Overall State Self-Esteem	-.44*	.67**	-.37*	.27	--	--	--	--	--
16. Social State Self-Esteem	-.50**	.64**	-.27	.11	.88**	--	--	--	--
17. Relationship Satisfaction	-.01	.07	-.43*	.05	-.06	-.11	--	--	--
18. Warmth	-.15	.08	.08	.26	-.17	-.17	-.06	--	--
19. Humility	.01	-.12	-.06	.03	-.18	.18	.13	.00	--
20. Competence	.04	.04	-.46*	-.23	-.12	-.12	.48**	.17	-.01

Note: * $p < .05$, ** $p < .01$

Comparison across groups. It should again be emphasized that these correlational post-hoc analyses are exploratory, and further, that sample sizes are small. As a consequence, the following comparisons should be interpreted with caution; they are meant only to explore whether reinvestigation of the studied topic should be undertaken. In comparing the correlation trends among the four groups, a number of similarities are apparent. First, relationship satisfaction was not related to any independent variables—

and this did not vary as a function of group membership. Second, attachment anxiety consistently predicted overall and social state self-esteem. These correlations were significant in Group 1, 2, and 4, and marginally significant in Group 3.

However, given that original hypotheses would suggest that the groups should vary in how they react to viewing online content, any differences in correlational trends among the groups are of most interest. Notably, negative affect was only predicted by attachment anxiety in Group 1. It was further strongly correlated with trait self-esteem for this group. In contrast, in Groups 2 and 4, negative affect is only seen to be related to trait self-esteem. These findings, albeit exploratory and correlational, are in a direction consistent with original hypotheses.

The extent to which positive affect was predicted by individual difference variables also fluctuated between groups. Positive affect was associated with attachment anxiety in both Groups 1 and 4. In contrast, positive affect did not appear to be related to individual difference variables in Groups 2 and 3.

Finally, some group discrepancies in the relationship between participants' impressions of the viewed individual and participants' scores on individual difference variables emerged. Of note, only in Groups 1 and 2—comprising participants who experienced rejection threat—were there significant correlations between individual difference variables and ratings of the viewed individual. Specifically, in Group 1, participants with higher attachment anxiety and lower trait self-esteem were more likely to rate the individual as being warmer. In Group 2, participants with higher attachment anxiety and lower trait self-esteem were instead more likely to rate the individual as being more competent. These findings are notable because although hypotheses do

suggest that warmth, humility, and competence ratings should be correlated with attachment anxiety and trait self-esteem, the direction of the correlations found in Groups 1 and 2 are contrary to expectations. While the hypotheses postulated that participants might derogate the viewed individual, the opposite here occurred.

Discussion

I originally hypothesized that attachment anxiety and relationship threat would interact to predict negative reactions to viewing romantic (as opposed to neutral) content online. In particular, I predicted that those high in attachment anxiety who had been introduced to rejection threat would be particularly vulnerable to negative consequences following viewing romantic content online, in contrast to those lower in attachment anxiety, or for those who had not been introduced to rejection threat. However, the data did not support these hypotheses. Save for a main effect of attachment anxiety (with lower levels of state self-esteem shown to be related to higher attachment anxiety), state self-esteem was unaffected by the types of online content viewed and whether viewers had experienced rejection threat. A similar pattern emerged for negative affect, in that none of the specified independent variables predicted higher levels of negative mood.

A possible explanation for these null effects relates to the chosen rejection threat manipulation. Although previous use of this manipulation was successful in instilling rejection threat (Murray et al., 2002), it is plausible that its effect in the current study was much more subdued. Recall that a given participant who was subject to the rejection threat condition received computerized feedback following completion of the 19-item Interpersonal Behaviours Inventory. This fabricated feedback stated that, according to the

participant's pattern of responses, trouble looms for her relationship. However, consider that because of the increased reliance on technology in the current age, today's students comprise a population for whom internet use is not only recreational, but often required—whether for their studies, work, communication with others, etc. As such, in order to functionally navigate this online environment, they need to be more wary of information posted on social networking sites. Indeed, school training often emphasizes to students the importance of assessing the credibility of online information.

Consequently, participants were perhaps more critical of the information presented in the current study, and less likely to believe the computerized feedback. Furthermore, a vast majority of the current sample comprised first year undergraduate students—likely resulting in a sizable number of dating participants whose relationships were very new at the time of study participation. Research has shown that individuals in new dating relationships often experience a rapid rise in satisfaction at the very beginning of the relationship, which does not taper off until later (Eidelson, 1980). It is possible that the strength of the satisfaction associated with these new relationships may have buffered any effects of rejection threat.

An alternate possibility for the null effects could also relate to the stimuli chosen. First, while the photographs that comprised the romantic condition did indeed depict the female individual with her romantic partner, the degree of affection displayed in the photographs was not excessive or unusual. Assuming that participants are daily exposed to similar content when they browse their own SNSs, perhaps the degree of “romance” displayed in the stimuli was not extreme enough to have elicited strong reactions. Second, participants here viewed photographs of a female individual, who, at the time of

most of these photographs, was approximately 3-4 years older than the average first year undergraduate student. If participants were perceptive of this age gap, it could very well make her less threatening and more inspirational as a comparison figure. Indeed, research has shown that comparisons against someone better off can be inspirational if individuals perceive that there is time for them to also achieve comparable success, but self-deflating if individuals perceived that they had already missed their chance to do so (Lockwood & Kunda, 1997). Third, it has been shown that people are particularly likely to draw comparisons against others who are similar to them (Goethals & Darley, 1977; Wood, 1989)—if participants did indeed perceive the female individual as being older (and thus less relatable), then perhaps the degree to which upward social comparisons were drawn would be less than anticipated, ultimately resulting in lesser negative consequences. Also affecting participants' perceived similarity with the female individual was the issue of culture. The female individual in question was biracial (Caucasian and East Asian), which I originally presumed would be advantageous, in that she would perhaps be seen as relatable to a greater proportion of participants. However, research suggests that in some scenarios, individuals are more likely to consider a mixed-race individual as being part of the outgroup, even if mixed with their own race (Gaither, Pauker, Slepian, & Sommers, 2016). If such a finding held true for the current study, then this would also make the female individual a less threatening comparison figure.

However, despite the lack of significant results associated with state self-esteem and negative affect, a three-way interaction did emerge as significant in predicting positive affect. This interaction revealed that only when viewing romantic content (and not neutral content) online, higher attachment anxiety predicted lower levels of positive

affect for those who had been exposed to rejection threat. Such a finding is consistent with hypotheses. Interestingly, it was further revealed that higher attachment anxiety predicted higher levels of positive affect for those who had not been exposed to rejection threat. Although this finding was unaccounted for, it is not altogether inconsistent with my hypotheses. Literature indicates that in some cases, upward social comparison can be of benefit; in particular, upward comparison can instill motivation (Collins, 1996; Huguet, Dumas, Monteil, & Genestoux, 2001). As mentioned earlier, if participants perceived that they were capable of achieving comparable success as the female individual, this may further make her less threatening and more motivational as a comparison figure (Lockwood & Kunda, 1997). Given that attachment anxiety and the tendency to engage in social comparison were positively correlated, it is thus stands to reason that individuals high in attachment anxiety had more opportunity to reap the motivational benefits of upward social comparison. Keeping all this in mind, further consider that on the PANAS, the positive affect score comprises items such as “inspired” and “determined”. It is thus possible that in the current study, upward social comparison of romantic content did not yield negative consequences for some individuals, but instead provided inspiration and motivation.

I also assessed participants’ impressions of the female individual. Data analyses revealed that ratings of humility and competence were not affected by attachment anxiety, social comparison condition, or rejection threat condition. However, warmth was predicted by a two-way interaction between rejection threat and attachment anxiety, such that participants with higher levels of attachment anxiety who had been exposed to rejection threat were more likely to rate the individual as being warmer than participants

who also had high levels of attachment anxiety, but were not exposed to rejection threat. This is contrary to hypotheses, as I had predicted that participants might derogate the female individual (i.e., rate her as being less warm, humble, and competent) if they themselves were feeling the threat of rejection. However, consider that this hypothesis stemmed from research showing that individuals engage in derogation of others—but only when their own self-esteem was threatened. In the current study, social comparison condition and rejection threat condition did not predict state self-esteem status. Consequently, it would make sense that participants did not derogate the viewed individual. In addressing the finding that participants high in attachment anxiety and exposed to rejection threat were more likely to rate the female individual as being high in warmth (in contrast to those low in attachment anxiety, or not exposed to rejection threat), it should again be emphasized that this finding was unexpected and inconsistent with hypotheses; as such, it would be prudent to replicate this finding prior to drawing conclusions. Further, recall that the warmth variable had a moderate negative skew—because most participants (regardless of condition assignment and attachment anxiety) rated the female individual as being quite warm, the size of any differences detected will be small. As in Study One, these high scores may have been the result of the stimuli chosen, as the female individual presented in the photographs appears to be wholesome and non-threatening.

In sum, the results of Study Two largely did not support original hypotheses. The only finding overtly consistent with my hypotheses was that positive affect is related to some combination of attachment anxiety, whether an individual views romantic or neutral content, and whether the viewer has been exposed to rejection threat. However, given that

negative consequences associated with viewing online romantic content had been operationalized as low state self-esteem and negative moods, then results garnered in Study Two are not sufficient to allow for rejection of the null hypotheses. That being said, exploratory post-hoc correlation analyses showed that the current study's lack of significant findings does not warrant throwing out the hypotheses altogether. These analyses indicated that only in the group of participants who had viewed romantic content and been exposed to rejection threat was there a significant and strong correlation between attachment anxiety and negative affect. To a limited extent, this hints that an effect may be present, but perhaps too weak to have been revealed through the current methodology and analyses.

Chapter 4

General Discussion

In the current day and age, extensive SNS and Facebook use have become the norm rather than the exception. This has, of course, spurred investigation into negative effects that may be associated with such use. There now exists a steadily growing body of literature associating SNS use with a myriad of effects. However, given the complexity and multi-faceted nature of SNSs, no verdict can be made about whether using them is inherently beneficial or detrimental. Indeed, this often varies as a function of how a given SNS is used. For example, research has shown that when used to foster relationships and communicate with other individuals, SNS use can enhance social self-esteem (Ellison, Steinfield, & Lampe, 2007; Valkenburg & Schouten, 2006). In contrast, when used as a platform through which to engage in upward social comparison, SNSs can be related to negative consequences such as lower self-esteem (Midgley, 2013) and negative emotions (Fardouly, Diedrichs, Vartanian, & Halliwell, 2015). In the current research project, these latter findings were further explored and extended. Specifically, I sought to add to the literature concerning the negative consequences associated with SNS-facilitated social comparison—with a particular focus on social comparisons of a romantic nature.

Broadly speaking, this research project was successful in uncovering novel information relating to romantic social comparison in the online environment. General trends were found that indeed suggest that certain individuals are particularly susceptible to experiencing negative consequences (operationalized as lower state self-esteem and more negative moods) after viewing—and presumably drawing upward comparisons to—online romantic content. In contrast, such trends were not discovered in response to

viewing neutral online content, thus suggesting that for a subset of individuals, there is a degree of potency associated with romantic (but not general) social comparison. However, given some discrepancies found between the two studies, they are discussed separately below.

Summary of Findings

Single individuals and online romantic social comparison. In Study One, I investigated the extent to which single individuals were impacted by romantic social comparison online, and whether they consequently derogated the individual whose content was viewed. In order to do this, I manipulated whether participants viewed romantic or nonromantic content, as well as how pessimistic they were about their own romantic prospects. Participants then self-reported their current levels of affect and self-esteem, as well as their impressions of the viewed individual, and I assessed whether these varied as a function of the type of content viewed, how pessimistic they were primed to be, and their level of attachment anxiety—while controlling for baseline levels trait self-esteem. Although nothing conclusive can be said of the extent to which participants' impressions of the individual was impacted, it was revealed that the three aforementioned independent variables interacted to predict both overall and social state self-esteem (marginally) and negative affect (significantly). Although caution should of course be exercised when interpreting findings that are only marginally significant, confidence can be drawn from the fact that the directions of all effects were as expected, and were consistent across each of the dependent variables. In particular, it was found that only after viewing romantic online content was the two-way interaction between

attachment anxiety and manipulation of pessimism for future romantic relationships present. This interaction was such that in the optimistic and pessimistic conditions (notably, conditions that prompted participants to think about romantic relationships and perhaps drew attention to their singleness) those high in attachment anxiety reported lower self-esteem and more negative affect than those low in attachment anxiety. This pattern of results was not present in the condition where participants were not primed at all about relationships, or among any conditions where participants did not view romantic content.

An interesting finding emerged in regards to the pessimism prime, particularly in the optimistic condition (wherein participants were told that it should be easy to find a partner in the future). I originally predicted that being primed to believe that it should be easy to find a partner would buffer any negative consequences for these participants by instilling the hope that they, too, would soon be able to find their own romantic partner with whom to post online content. In contrast, it was shown that being in the optimistic condition was associated with negative consequences, much like the pessimistic condition. As such, it is apparent that the optimistic manipulation/prime did not work in the direction I had hoped. It is instead likely that the optimistic article instead prompted participants to focus on the discrepancy between the alleged ease of finding a partner and their singleness—thus priming them to feel worse about themselves. Indeed, literature has shown that individuals low in self-esteem have a tendency to interpret ambiguous or neutral feedback as being indicative of some negative feature about themselves, while those high in self-esteem do not exhibit such a tendency (Fitch, 1970; Suls, Lemos, & Stewart, 2002). It is possible that a similar story emerges for those high, relative to low,

in attachment anxiety: they may be more prone to interpret information that is meant to be optimistic in a more negative light.

Dating individuals and online romantic social comparison. Study Two aimed to study the same phenomenon—potential negative consequences associated with romantic social comparison online—but this time, the population of interest were viewers who were themselves in dating relationships. In order to investigate this, I manipulated whether participants viewed romantic or nonromantic content (as before), as well as the presence or absence of rejection threat in participants' relationships. Participants then self-reported their current levels of affect and self-esteem, as well as their impressions of the viewed individual, and I assessed whether these varied as a function of the type of content viewed, how pessimistic they were primed to be, and their level of attachment anxiety—while controlling for baseline levels trait self-esteem. Similar to the single individuals, evidence for derogation of the viewed individual was not found. However, unlike the study with single individuals, no clear story emerged in regards to self-esteem and mood. The expected three-way interaction among attachment anxiety, type of content viewed, and rejection threat did not significantly predict either overall or state self-esteem, nor was it related to negative affect. These three variables, however, did predict levels of positive affect: in particular, only after viewing romantic photographs did a relationship emerge between attachment anxiety and rejection threat condition. In particular, individuals who were not exposed to rejection threat were more likely to report higher levels of positive affect if they had high, as opposed to low, attachment anxiety. For those exposed to rejection threat, however, this relationship between attachment anxiety and positive affect was trending in the opposite direction (i.e., those with higher

attachment anxiety were more likely to report lower levels of positive affect than those with lower attachment anxiety), although this slope did not reach significance.

This finding suggests that, in the face of romantic content, the absence of rejection threat allows participants high in attachment anxiety to perhaps find the upward romantic social comparisons inspiring and motivational (as reflected in greater positive affect), while the experience of rejection threat dampens such an association. In this regard, the results of the Study Two are not incompatible with those of Study One. Whereas the latter revealed that certain individuals are prone to feeling lower state self-esteem and higher negative moods, the former revealed that certain individuals are prone to feeling less positively—which can be interpreted as a much milder version of the latter. Exploratory post-hoc correlations further strengthened my belief in such a conjecture by revealing that a correlation between negative affect and attachment anxiety existed only in the group of participants who viewed romantic (as opposed to neutral) Facebook content and were also subject to rejection threat.

Limitations and Future Directions

The current research project has allowed for preliminary investigation into whether individual difference variables (namely attachment anxiety and trait self-esteem) interact with pessimism about future romantic prospects (for single individuals) and relationship threat (for dating individuals) to moderate the extent to which viewing romantic information posted online impact viewers' mood and self-evaluations. However, participants here drew comparisons against a complete stranger. As a consequence, an important variable is not yet addressed: the psychological closeness

between the viewer and the person whose information he/she is viewing. As per the self-evaluation maintenance theory (Tesser, 1988), if the domain of comparison is relevant to a person's self-definition, then an individual will feel more threatened if a close friend succeeds in this domain, as opposed to a stranger. Conversely, if the domain of comparison is irrelevant to one's self-definition, then the individual will actually experience a boost in self-evaluation if a close friend succeeds in this domain, due to the phenomenon of basking in reflected glory (Cialdini et al., 1976). Specific to the topic at hand, consider individuals who put great emphasis on the relationships in their lives; people whose self-esteem may be contingent on the success of their relationships. These individuals' self-identities are likely influenced by their current relationship statuses, and consequently, they may be particularly susceptible to changes in self-evaluation after viewing relationship-related information on Facebook.

Also to consider is that although participants were explicitly told that the stimuli (photographs) they viewed were pulled from Facebook, there is much more to the Facebook-browsing experience than photographs. For example, Facebook allows users to write posts and statuses, upload personal videos, share links, and display personal information (i.e., information about relationship status, employment, education, etc.). Users are also able to comment on and like others' content. As such, passively viewing photographs is hardly representative of the true Facebook-browsing experience—and may have thus resulted in weaker effects. Consequently, the results obtained from the current studies may not be immediately generalizable to Facebook use in the real world.

It should be noted that I have begun to pilot a third study that addresses the above two limitations. In this study, a given participant logs onto her own Facebook account,

navigates to the online profile of either an acquaintance, friend, or close friend (that they know to be in a dating relationship), and views online romantic content posted by the chosen Facebook friend (See Appendix G for more detail). Such a study design has high ecological validity and affords an opportunity to account for psychological closeness. Although data collection remains ongoing as sample size is currently quite low, preliminary data analysis hints at some degree of conformity with the self-evaluation maintenance theory (Tesser, 1988): single individuals who are high in relationship-contingent self-esteem appear to be more tolerant of romantic content posted by acquaintances, as opposed to close friends.

However, across these studies (including the naturalistic pilot study briefly described above), it is important to consider the sampled population. First-year undergraduate students comprise a vast majority of participants—which may have heavily influenced the pattern of results detected. Consider that these students are often living away from home for the first time. They are immersed in a novel environment and suddenly meeting hundreds of new people. As such, there is (anecdotally) little pressure to find or maintain any serious romantic relationships. Indeed, according to Rusbult's Investment Model (1980), commitment to a given relationship is largely determined by three factors: satisfaction, quality of alternatives, and investment. There are plenty of alternatives for a first year student, for whom the novel environment is chockfull of new friends, unexplored opportunities, and potential partners. Hypothetically, this would especially affect single individuals, who may thus be more optimistic about their future romantic prospects—potentially reducing or buffering any negative consequences that may be associated with romantic social comparison. As such, reinvestigation with a

slightly older population may be fruitful. For older individuals, the pressure to find a romantic partner and to be part of a committed relationship is likely be stronger; as such, I would hypothesize that such an investigation would yield stronger effects than those documented in the current thesis.

Finally, although the current program of research focused quite heavily on Facebook, other SNSs are surely garnering more users daily. There is much more research to be done on these newer social networking platforms, including (but not limited to) Instagram, Twitter, and Snapchat. The results of the current thesis—that Facebook-facilitated romantic social comparison can be linked to negative effects for select individuals—begs the question of whether similar effects occur on these other SNSs, and if so, whether the extent to which they do differs among the various SNSs. Indeed, it might be the case that different factors are at play for each. For example, Snapchat, as well as Twitter to some degree, allows users to share day-to-day happenings “in real time”, in that moments are “snapped” or “tweeted” about as they occur. Although this may reduce the extent to which users can positively self-present, it may also increase viewers’ perceived accuracy of posted content. Further, unlike Facebook, Twitter and Instagram also users to interact with others they do not know personally (i.e., strangers and celebrities), allowing for a much more varied range of potential comparison figures. It is also worth considering that the average individual probably uses more than just one SNS; a more likely scenario is that he/she regularly uses several. Perhaps exposure to the holistic combination of posted content across the various SNSs may actually be the most impactful, in contrast to exposure to content from just one.

Implications

The results of the current project provide some initial evidence that viewing romantic content online differentially affects viewers. At highest risk are individuals who are high in attachment anxiety and endorse relationship insecurities or concerns (i.e., about their own future romantic prospects, or about their current relationships). Of course, some reinvestigation and replication is warranted (especially in the case of dating individuals), but the preliminary data gathered seems to suggest that to some degree, it is possible to predict individuals who might react negatively to viewing others' romantic content. Although it is at present not possible to comment on the longevity of the negative consequences associated with viewing romantic content, there are still a number of implications that can be drawn.

First, this finding has implications for the way SNS users may choose to go about navigating the online environment. For example, being more mindful of the consequences that may potentially be related to upward romantic social comparison may help in buffering the potency of such effects. Second, in looking forward, these findings might also be useful for counsellors and have implications related to psychological health. Indeed, individuals who are high in attachment anxiety and endorse relationship insecurities would be ill-advised to chronically spend copious amounts of time browsing SNSs, as these environments provide ample opportunity to engage in upward romantic social comparisons.

Relating to the above two points, this project thus highlights a need for future investigation of ways in which to dampen, attenuate, or diminish the consequences associated with romantic social comparison in the online environment. There currently

exist several non-profit initiatives that serve to train youths' media and digital literacy. For example, MediaSmarts is a Canadian-based organization that provides educational resources to classrooms and hosts a nation-wide "Media Literacy Week", with a mission to help youth develop the critical thinking skills necessary to safely navigate various types of media in an informed manner. A similar idea can be adapted for navigation of SNSs. Educational/training resources can be provided that teach participants how to mindfully and critically assess information they may encounter online. They can be reminded that posted information is not necessarily veridical, as people generally tend to hand-pick the information they share online. The merit of this idea can be investigated by providing such a training protocol to a subset of individuals, and assessing the extent to which their mood and self-esteem changes after viewing others' online content, relative to individuals who had not received the training.

Everything taken together, this thesis sheds some light on unintended side effects associated with the constant connectivity that Facebook offers. However, continued research is still needed. The nature of technology in the modern age is that much is continually being improved upon and furthered. As such, it is prudent that users' understanding and knowledge of these technologies and their potential consequences are concurrently improved upon and furthered. Luckily, the body of research on SNS use—among which this project can now be included—provides an adequate springboard upon which to do so.

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Appendix A

Ethics Documents

Letter of Information NARWHAL

This research is being conducted by Pauline Leung, a Master's student working with Dr. Tara MacDonald, Associate Professor of the Department of Psychology at Queen's University in Kingston, Ontario.

What is this study about? The purpose of this research is to investigate social media use and reactions concerning information posted on social media websites. We ask participants to view some content, then complete several measures and surveys on the computer. We estimate that it takes about 30 minutes to complete these tasks and that there are no known physical, psychological, economic, or social risks associated with them.

Is my participation voluntary? Yes. Although it would be greatly appreciated if you would answer all material as frankly as possible, you should not feel obliged to answer any material that you find objectionable or that makes you feel uncomfortable. You may also withdraw at any time with no penalties at all.

What will happen to my responses? We will keep your responses confidential. We will store the data in the locked lab room until the data is no longer needed. Only authorized researchers associated with the lab have access to this area. To help us ensure confidentiality, please do not put your name on any of the research study answer sheets. The data being collected today may be reanalyzed in the future to answer related questions about this research area. Confidentiality will be maintained at all times. The data may also be published and presented; however, this will be in the form of general findings and will not at any point breach confidentiality. Should you be interested, you are entitled to a copy of the findings.

Will I be compensated for my participation? Yes. In exchange for your help, we will grant you 0.5 credits towards Psychology 100 for a half hour of participation in the lab. If you are not enrolled in Psychology 100, you will be compensated \$5.00 cash for your time.

Any questions about study participation may be directed to Pauline Leung at 13pl28@queensu.ca or Dr. Tara MacDonald at tmacdon@queensu.ca. Any ethical concerns about the study may be directed to the Chair of the General Research Ethics Board at 613-533-6081 or Chair.GREB@queensu.ca

This study has been granted clearance according to the recommended principles of Canadian ethics guidelines, and Queen's policies.

Again, thank you. Your interest in participating in this research study is greatly appreciated.

Dr. Tara MacDonald
Associate Professor

Pauline Leung
Master's Student

**Consent Form
NARWHAL**

1. I have read the Letter of Information and have had any questions answered to my satisfaction.
2. I understand that I will be participating in the Narwhal Study, which entails reading and viewing some information, and subsequently completing several surveys on the computer. I understand that my responses will be used to research social media use.
3. I understand that this session will take 30 minutes and that I will receive 0.5 credits for my time.
4. I understand that my participation in this study is voluntary and that I can choose to withdraw at any time without penalty.
5. I understand that every effort will be made to ensure confidentiality of the data. Data will be stored in The MacLab, with access restricted only to authorized researchers. Data that is published will state general findings and will not refer to any individual participants by name.
6. I understand that the data being collected today may be reanalyzed in the future to answer related questions about this research area. Confidentiality will be maintained at all times.

Any questions about study participation may be directed to Pauline Leung at 13pl28@queensu.ca or Dr. Tara MacDonald at tmacdon@queensu.ca. Any ethical concerns about the study may be directed to the Chair of the General Research Ethics Board at 613-533-6081 or Chair.GREB@queensu.ca

I have read the above statements and freely consent to participate in this research:

- ☐ I agree to participate
- ☐ No thanks. I do not wish to participate (ends the session)

Type your first and last name as an electronic signature:

Debriefing Form (Study One)

First and foremost: thank you for your participation in our research. Social Psychology is a vast field of study, with a prominent branch conducting research on romantic relationships. Given the complex nature of such a topic, it is not uncommon that researchers need to be vague in describing the tasks at hand, so as to reduce the influence of bias or certain beliefs on participant responses. Researchers can also employ manipulations in order to temporarily instill certain attitudes/thoughts in order to test whether these attitudes/thoughts affect how a participant responds.

That being said, you may recall that I initially told you that this study aims to investigate online behaviour on social media outlets, particularly attitudes concerning information posted online. However, our main focus was much more specific—we wanted to investigate whether viewing photographs of romantic couples would dampen the mood or self-esteem of the viewer. Furthermore, you were made to read an article. This article may have been about a topic completely unrelated to relationships, or the article may have made a claim about how easy or difficult it would be to find a romantic partner in the future. If the article you read falls into latter category, *these articles were entirely fabricated* and have not been validated by scientific research. We simply wanted to see whether being pessimistic or optimistic about finding a partner for yourself would influence how much your mood and self-esteem are affected (if at all) by viewing photographs of happy couples. If your article was unrelated to relationships altogether, this simply means that we measured the extent to which viewing the photographs affected you, without manipulating pessimism/optimism levels.

I'm sure it is not difficult to see the relevance of this study to the life of an average young adult in today's society. Chances are high that you've already heard allegations that viewing the profiles of high-achieving peers on social media sites (Facebook in particular) increases jealousy and other negative emotions. Indeed, these claims do hold some merit. However, to date, there have been no research looking at these factors—Facebook use, jealousy, and negative emotions—from a strictly romantic perspective. Simply put, does being bombarded with photographs of your friends and their seemingly happy dating relationships cause more harm than good? Ideally, the results of this study will shed a light on this, and you will have played a very important role!

In the event that you would like to see a counsellor about this study, please contact The Student Wellness Centre at 533-2506. They are located at 146 Stuart in the St. LaSalle Bldg, (across the street from Adelaide Hall). Also, please feel free to talk to the experimenter for more information on the research you just participated in.

If you would like further information on this area of research, these are some related references that might be of interest to you.

Chou, H.T.G, & Edge, N. (2012). "They are happier and having better lives than I am": The impact of using Facebook on perceptions of others' lives. *Cyberpsychology, Behaviour, and Social Networking*, 15(2), 117-121.

Saslow, L.R., Muise, A., Impett, E.A., & Dubin, M. (2013). Can you see how happy we are? Facebook images and relationship satisfaction. *Social Psychological and Personality Science*, (4)4, 411-418.

Questions about study participation may be directed to Dr. Tara MacDonald at tmacdon@queensu.ca, or to Pauline Leung at pauline.leung@queensu.ca. Any ethical concerns may be directed to the Chair of the General Research Ethics Board at 613-533-6081 or Chair.GREB@queensu.ca

Again, thank you. Your interest in participating in this research study is greatly appreciated.

Dr. Tara MacDonald
Associate Professor

Pauline Leung
Master's Student

Debriefing Form (Study Two)

First and foremost: thank you for your participation in our research. Social Psychology is a vast field of study, with a prominent branch conducting research on romantic relationships. Given the complex nature of such a topic, it is not uncommon that researchers need to be vague in describing the tasks at hand, so as to reduce the influence of bias or certain beliefs on participant responses. Researchers can also employ manipulations in order to temporarily instill certain attitudes/thoughts in order to test whether these attitudes/thoughts affect how a participant responds.

That being said, you may recall that I initially told you that this study aims to investigate online behaviour on social media outlets, particularly feelings and attitudes concerning information posted online. While this is not untrue, our main focus was much more specific—we mainly want to investigate whether viewing photographs of romantic couples would dampen the mood or self-esteem of the viewer. Furthermore, you were made to fill out a survey that asked you many questions about habits you may have around your romantic partner. Following this, the computer might have scored your results and reported them to you immediately, claiming that your partner probably finds many of your habits annoying/irritating. If so, these *test results were entirely fabricated!* The *feedback you received was completely independent of your actual responses*. In fact, we never once looked at your responses at all. We simply wanted to see whether your security in your own relationship would influence how much your mood and self-esteem are affected (if at all) by viewing photographs of other happy couples.

I'm sure it is not difficult to see the relevance of this study to the life of an average young adult in today's society. Chances are high that you've already heard allegations that viewing the profiles of high-achieving peers on social media sites (Facebook in particular) increases jealousy and other negative emotions. Indeed, these claims do hold some merit. However, to date, there have been no research looking at these factors—Facebook use, jealousy, and negative emotions—from a strictly romantic perspective. Simply put, does being bombarded with photographs of your friends and their seemingly happy dating relationships cause more harm than good? Ideally, the results of this study will shed a light on this, and you will have played a very important role!

In the event that you would like to see a counsellor about this study, please contact The Student Wellness Centre at 533-2506. They are located at 146 Stuart in the St. LaSalle Bldg (across the street from Adelaide Hall). Also, please feel free to talk to the experimenter for more information on the research you just participated in.

If you would like further information on this area of research, these are some related references that might be of interest to you.

Chou, H.T.G., & Edge, N. (2012). "They are happier and having better lives than I am": The impact of using Facebook on perceptions of others' lives. *Cyberpsychology, Behaviour, and Social Networking*, 15(2), 117-121.

Saslow, L.R., Muise, A., Impett, E.A., & Dubin, M. (2013). Can you see how happy we are? Facebook images and relationship satisfaction. *Social Psychological and Personality Science*, (4)4, 411-418.

Questions about study participation may be directed to Dr. Tara MacDonald at tmacdon@queensu.ca, or to Pauline Leung at pauline.leung@queensu.ca. Any ethical concerns may be directed to the Chair of the General Research Ethics Board at 613-533-6081 or Chair.GREB@queensu.ca

Again, thank you. Your interest in participating in this research study is greatly appreciated.

Dr. Tara MacDonald
Associate Professor

Pauline Leung
Master's Student

January 23, 2015

Miss Pauline Leung
Master's Student
Department of Psychology
Queen's University
Kingston, ON, K7L 3N6

GREB Ref #: GPSYC-693-15; Romeo # 6014614
Title: "GPSYC-693-15 Social Media and Romantic Social Comparison"

Dear Miss Leung:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled "**GPSYC-693-15 Social Media and Romantic Social Comparison**" for ethical compliance with the Tri-Council Guidelines (TCPS) and Queen's ethics policies. In accordance with the Tri-Council Guidelines (article D.1.6) and Senate Terms of Reference (article G), your project has been cleared for one year. At the end of each year, the GREB will ask if your project has been completed and if not, what changes have occurred or will occur in the next year.

You are reminded of your obligation to advise the GREB, with a copy to your unit REB, of any adverse event(s) that occur during this one year period (access this form at https://eservices.queensu.ca/romeo_researcher/ and click Events - GREB Adverse Event Report). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example you must report changes to the level of risk, applicant characteristics, and implementation of new procedures. To make an amendment, access the application at https://eservices.queensu.ca/romeo_researcher/ and click Events - GREB Amendment to Approved Study Form. These changes will automatically be sent to the Ethics Coordinator, Gail Irving, at the Office of Research Services or irvingg@queensu.ca for further review and clearance by the GREB or GREB Chair.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

A handwritten signature in black ink that reads "Joan Stevenson".

Joan Stevenson, Ph.D.
Chair
General Research Ethics Board

c: Dr. Tara MacDonald, Faculty Supervisor
Dr. Stanka Fitneva, Chair, Unit REB
Ms. Marie Tooley, Dept. Admin.

Appendix B

Prescreening Measures

Experiences in Close Relationships – Revised

Please indicate on a 7-point scale the extent to which you identify with each statement.

1	2	3	4	5	6	7
Disagree Strongly			Neutral or Mixed			Agree Strongly

- 1) I'm afraid that I will lose my partner's love.
- 2) I often worry that my partner will not want to stay with me.
- 3) I often worry that my partner doesn't really love me.
- 4) I worry that romantic partners won't care about me as much as I care about them.
- 5) I often wish that my partner's feelings for me were as strong as my feelings for him or her.
- 6) I worry a lot about my relationships.
- 7) When my partner is out of sight, I worry that he/she might become interested in someone else.
- 8) When I show my feelings for romantic partners, I'm afraid they will not feel the same about me.
- 9) I rarely worry about my partner leaving me.
- 10) My romantic partner makes me doubt myself.
- 11) I do not often worry about being abandoned.
- 12) I find that my partner(s) don't want to get as close as I would like.
- 13) Sometimes romantic partners change their feelings about me for no apparent reason.
- 14) My desire to be very close sometimes scares people away.
- 15) I'm afraid that once a romantic partner gets to know me, he/she won't like who I really am.
- 16) It makes me mad that I don't get the affection and support I need from my partner.
- 17) I worry that I won't measure up to other people.
- 18) My partner only seems to notice me when I'm angry.
- 19) I prefer not to show a partner how I feel deep down.
- 20) I feel comfortable sharing my private thoughts and feelings with my partner.
- 21) I find it difficult to allow myself to depend on romantic partners.
- 22) I am very comfortable being close to romantic partners.
- 23) I don't feel comfortable opening up to romantic partners.
- 24) I prefer not to be too close to romantic partners.
- 25) I get uncomfortable when a romantic partner wants to be very close.
- 26) I find it relatively easy to get close to my partner.
- 27) It's not difficult for me to get close to my partner.
- 28) I usually discuss my problems and concerns with my partner.
- 29) It helps to turn to my romantic partner in times of need.
- 30) I tell my partner just about everything.
- 31) I talk things over with my partner.
- 32) I am nervous when partners get too close to me.
- 33) I feel comfortable depending on romantic partners.
- 34) I find it easy to depend on romantic partners.
- 35) It's easy for me to be affectionate with my partner.
- 36) My partner really understands me and my needs.

Rosenberg Self-Esteem Scale

Please indicate on a 7-point scale (where 1 = completely disagree and 7 = completely agree) the extent to which you identify with each statement.

1	2	3	4	5	6	7
Disagree Strongly			Neutral or Mixed			Agree Strongly

- 1) On the whole, I am satisfied with myself.
- 2) At times, I think I am no good at all.
- 3) I feel that I have a number of good qualities.
- 4) I am able to do things as well as most other people.
- 5) I feel I do not have much to be proud of.
- 6) I certainly feel useless at times.
- 7) I feel that I'm a person of worth, at least on an equal plane with others.
- 8) I wish I could have more respect for myself.
- 9) All in all, I am inclined to feel that I am a failure.
- 10) I take a positive attitude toward myself.

Relationship-Contingent Self-Esteem Scale

Please indicate on a 7-point scale the extent to which you identify with each statement. If you are not currently in a romantic relationship, try to recall how you felt during your most recent relationship or imagine how you would feel while in one.

1	2	3	4	5	6	7
Disagree Strongly			Neutral or Mixed			Agree Strongly

- 1) I feel better about myself when it seems like my partner and I are getting along
- 2) I feel better about myself when it seems like my partner and I are emotionally connected.
- 3) An important measure of my self-worth is how successful my relationship is.
- 4) When my relationship is going well, I feel better about myself overall.
- 5) If my relationship were to end tomorrow, I would not let it affect how I feel about myself.
- 6) My self-worth is unaffected when things go wrong in my relationship.
- 7) When my partner and I fight, I feel bad about myself in general.
- 8) When my relationship is going bad, my feelings of self-worth remain unaffected.
- 9) I feel better about myself when others tell me that my partner and I have a good relationship.
- 10) When my partner criticizes me or seems disappointed in me, it makes me feel really bad.

Scale for Social Comparison Orientation

Most people compare themselves from time to time with others. For example, they may compare the way they feel, their opinions, their abilities, and/or their situation with those of other people. There is nothing particularly 'good' or 'bad' about this type of comparison, and some people do it more than others. We would like to find out how often you compare yourself with other people. To do that we would like to ask you to indicate how much you agree with each statement below.

1	2	3	4	5	6	7
Disagree Strongly			Neutral or Mixed			Agree Strongly

- 1) I often compare myself with others with respect to what I have accomplished in life
- 2) If I want to learn more about something, I try to find out what others think about it
- 3) I always pay a lot of attention to how I do things compared with how others do things
- 4) I often compare how my loved ones (boy or girlfriend, family members, etc.) are doing with how others are doing
- 5) I always like to know what others in a similar situation would do
- 6) I am not the type of person who compares often with others
- 7) If I want to find out how well I have done something, I compare what I have done with how others have done
- 8) I often try to find out what others think who face similar problems as I face
- 9) I often like to talk with others about mutual opinions and experiences
- 10) I never consider my situation in life relative to that of other people
- 11) I often compare how I am doing socially (e.g., social skills, popularity) with other people

Fear of Being Single Scale

We are interested in investigating fears surrounding singlehood, and the extent to which one yearns for a relationship. Each statement below is assessed on how much it rings true, on a 7-point Likert scale.

1	2	3	4	5	6	7
Disagree Strongly			Neutral or Mixed			Agree Strongly

- 1) It scares me to think that there might not be anyone out there for me.
- 2) I feel it is close to being too late for me to find the love of my life.
- 3) I feel anxious when I think about being single forever.
- 4) I need to find a partner before I'm too old to have and raise children.
- 5) If I end up alone in life, I will probably feel like there is something wrong with me.
- 6) As I get older, it will get harder and harder to find someone.

Appendix C

Study Two (Rejection Threat Manipulation)

Experimental Condition: *Feedback to Interpersonal Behaviors Inventory*

Your percentile rank: 81.46

Score category: Moderate to High

This is considerably higher than the average score.

What this suggests is that your partner may have some unspoken complaints about aspects of your behavior or personality that may be surfacing indirectly (through your partner's teasing, being impatient, short-tempered, etc.). While this is merely a survey, be wary that such unspoken complaints often turn into major sources of conflict as relationships progress.

Note: your score was calculated using an a priori criterion of .05 and was determined to have a 95% confidence interval of 78.05 - 84.87. Stratification of the norm population is based on relevant geographic and demographic dimensions. Exploratory factor analysis supported a 1-factor solution in the IBI, and further investigations of concurrent validity with other validated scales support use (ERS-III, $r = .79$; MDRS-R, $r = .85$). Test-retest reliability ranges from .79 - .92. This has excellent predictive value in the upper criterion.

Manipulation Check: *Debrief Questionnaire*

Answer the following questions in the provided spaces. Any answers that you provide will be kept confidential and anonymous.

- 1) What do you think the purpose of this study was?

- 2) Was there anything that struck you as unusual or odd? If yes, please describe.

- 3) Was there anything that struck you as unusual about the initial questionnaire (the one that asked you about your dating relationship)?

- 4) Did you find the results of the questionnaire believable? Please elaborate.

Appendix D

In-Lab Questionnaires

State Self-Esteem Scale (Study 1 & 2)

This is a questionnaire designed to measure what you are thinking at this moment. There is, of course, no right answer for any statement. The best answer is what you feel is true of yourself at the moment. Be sure to answer all of the items, even if you are not certain of the best answer. Again, answer these questions as they are true for you **RIGHT NOW**.

1	2	3	4	5
Not at All	A Little Bit	Somewhat	Very Much	Extremely

- 1) I feel confident about my abilities
- 2) I am worried about whether I am regarded as a success or failure
- 3) I feel satisfied with the way my body looks right now
- 4) I feel frustrated or rattled about my performance
- 5) I feel that I am having trouble understanding things that I read
- 6) I feel that others respect and admire me
- 7) I am dissatisfied with my weight
- 8) I feel self-conscious
- 9) I feel as smart as others
- 10) I feel displeased with myself
- 11) I feel good about myself
- 12) I am pleased with my appearance right now
- 13) I am worried about what other people think of me
- 14) I feel confident that I understand things
- 15) I feel inferior to others at this moment
- 16) I feel unattractive
- 17) I feel concerned about the impression I am making
- 18) I feel that I have less scholastic ability right now than others
- 19) I feel like I'm not doing very well
- 20) I am worried about looking foolish

The Positive and Negative Affect Schedule

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate to what extent you feel this way right now (that is, at the present moment) using the following scale:

1	2	3	4	5
Not at All	A Little Bit	Moderately	Quite a Bit	Extremely

1) Interested	8) Hostile	15) Nervous
2) Distressed	9) Enthusiastic	16) Determined
3) Excited	10) Proud	17) Attentive
4) Upset	11) Irritable	18) Jittery
5) Strong	12) Alert	19) Active
6) Guilty	13) Ashamed	20) Afraid
7) Scared	14) Inspired	

Impressions of the Female Individual

Now thinking back to the individual whose photographs you viewed, indicate how much you believe each word describes her.

1	2	3	4	5
Not at All	A Little Bit	Moderately	Quite a Bit	Extremely

1) Warm	6) Hard-working
2) Vain	7) Smug
3) Conceited	8) Likeable
4) Smart	9) Attention-Seeking
5) Fake	10) Kind

Relationship Ambivalence Scale

Please answer the following questions about your dating relationship. After each sentence, choose the number that indicates how true the statement is of yourself using the following scale:

1	2	3	4	5
Not true at all		Moderately true		Completely true

- 1) I am serious about the current dating relationship.
- 2) I am satisfied with the current dating relationship.
- 3) I am "in love" at this point in the relationship.
- 4) I feel somewhat unsure about continuing the relationship.
- 5) I never tire of the other person's company no matter how much time is spent together.
- 6) I become closer to the other person even when external events threaten the relationship (e.g., separation).
- 7) I will begin to question the relationship as he or she discovers the other person's faults.
- 8) I may at some point become attracted enough to another person to consider leaving the relationship.
- 9) I will become even happier and more satisfied with the relationship over time.
- 10) I will probably discover areas in which his or her needs conflict with those of the other person.

Appendix E

Bivariate Correlations By Group (Study One)

Group 1: Optimism Condition x Romantic Social Comparison Condition

Measure	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.19	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.66**	.25	--	--	--	--	--	--	--
4. Fear of Being Single	.76**	.04	.56**	--	--	--	--	--	--
5. Social Comparison Orientation	.35*	.24	.46*	.47**	--	--	--	--	--
6. Trait Self-Esteem	-.51**	-.28	-.39	-.50**	-.50**	--	--	--	--
7. Negative Affect	.56**	.12	.43*	.55**	.02	-.21	--	--	--
8. Positive Affect	.01	-.06	.18	-.07	-.05	.15	.31	--	--
7. Overall State Self-Esteem	-.74**	-.28	-.45*	-.77**	-.27	.60**	-.43**	.25	--
8. Social State Self-Esteem	-.77**	-.19	-.56**	-.69**	-.23	.57**	-.40*	.27	.92**

*Note: *p < .05, **p < .01*

Group 2: Optimism Condition x Neutral Social Comparison Condition

Measure	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.16	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.18	-.54**	--	--	--	--	--	--	--
4. Fear of Being Single	.49*	-.04	.49*	--	--	--	--	--	--
5. Social Comparison Orientation	.28	-.27	.73**	.53**	--	--	--	--	--
6. Trait Self-Esteem	-.40*	-.48**	.12	-.31	.01	--	--	--	--
7. Negative Affect	.11	.21	-.51*	-.02	-.14	-.26	--	--	--
8. Positive Affect	-.12	-.32	.09	-.32	.28	.55**	-.34*	--	--
9. Overall State Self-Esteem	-.50**	-.54**	.16	-.37	-.01	.80**	-.47**	.61**	--
10. Social State Self-Esteem	-.40*	-.40*	-.21	-.29	-.09	.77**	-.50**	.50**	.88**

*Note: *p < .05, **p < .01*

Group 3: Pessimism Condition x Romantic Social Comparison Condition

Measure	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.16	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.64**	.06	--	--	--	--	--	--	--
4. Fear of Being Single	.55**	.05	.63**	--	--	--	--	--	--
5. Social Comparison Orientation	.24	-.32	.28	.35	--	--	--	--	--
6. Trait Self-Esteem	-.34	.10	-.48**	-.36	-.24	--	--	--	--
7. Negative Affect	.35*	-.19	.38*	.41*	.20	-.59**	--	--	--
8. Positive Affect	.08	-.26	-.17	.15	.24	.24	-.05	--	--
9. Overall State Self-Esteem	-.59**	.12	-.60**	-.45*	-.39*	.78**	-.70**	.16	--
10. Social State Self-Esteem	-.59**	-.02	-.68**	-.45*	-.38*	.65**	-.50**	.07	.85**

Note: * $p < .05$, ** $p < .01$

Group 4: Pessimism Condition x Neutral Social Comparison Condition

Measure	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.45**	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.39*	-.19	--	--	--	--	--	--	--
4. Fear of Being Single	.31	.26	.35	--	--	--	--	--	--
5. Social Comparison Orientation	.14	.08	.47*	.46**	--	--	--	--	--
6. Trait Self-Esteem	-.69**	-.62**	-.03	-.30	-.03	--	--	--	--
7. Negative Affect	-.08	-.15	.44*	-.06	-.08	.00	--	--	--
8. Positive Affect	-.41*	-.36*	-.06	.07	-.01	.38*	.10	--	--
9. Overall State Self-Esteem	-.40*	-.21	-.49**	-.40*	-.25	.53**	-.37*	.26	--
10. Social State Self-Esteem	-.47**	-.22	-.57**	-.51**	-.46**	.47**	-.18	.26	.86**

Note: * $p < .05$, ** $p < .01$

Group 5: Control Condition x Romantic Social Comparison Condition

Measure	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.20	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.40*	.38*	--	--	--	--	--	--	--
4. Fear of Being Single	.50*	.26	.35	--	--	--	--	--	--
5. Social Comparison Orientation	.55**	.06	.23	.25	--	--	--	--	--
6. Trait Self-Esteem	-.53**	-.38*	-.35	-.38**	-.49**	--	--	--	--
7. Negative Affect	-.02	-.06	.14	.20	.38*	-.14	--	--	--
8. Positive Affect	-.18	-.37*	-.08	-.11	-.20	.47*	-.16	--	--
9. Overall State Self-Esteem	-.41*	-.12	-.48**	-.20	-.49**	.74**	-.45**	.59**	--
10. Social State Self-Esteem	-.31	-.20	-.52**	-.17	-.40*	.68**	-.35*	.39*	.87**

Note: * $p < .05$, ** $p < .01$

Group 6: Control Condition x Neutral Social Comparison Condition

Measure	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.34	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.56**	.14	--	--	--	--	--	--	--
4. Fear of Being Single	.48*	.41*	.57**	--	--	--	--	--	--
5. Social Comparison Orientation	.60**	.10	.66**	.47*	--	--	--	--	--
6. Trait Self-Esteem	-.58**	-.38*	-.52**	-.57**	-.55**	--	--	--	--
7. Negative Affect	.22	.06	.16	.06	.37*	-.23	--	--	--
8. Positive Affect	-.45**	-.50**	-.12	-.18	-.14	.43*	-.13	--	--
9. Overall State Self-Esteem	-.58**	-.17	-.32	-.22	-.54**	.55**	-.49**	.57**	--
10. Social State Self-Esteem	-.51**	-.12	-.36	-.20	-.52*	.48**	-.54**	.53**	.94**

Note: * $p < .05$, ** $p < .01$

Appendix F

Bivariate Correlations By Group (Study Two)

Group 1: Rejection Threat Condition x Romantic Social Comparison Condition

Measure	1	2	3	4	5	6	7	8	9	10
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.47**	--	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.27	-.34	--	--	--	--	--	--	--	--
4. Fear of Being Single	.36	.01	-.12	--	--	--	--	--	--	--
5. Social Comparison Orientation	.29	.02	.74**	-.20	--	--	--	--	--	--
6. Trait Self-Esteem	-.56**	-.03	-.39	-.27	-.49*	--	--	--	--	--
7. Negative Affect	.15	.49**	-.08	-.01	.30	-.09	--	--	--	--
8. Positive Affect	-.35	-.10	.05	-.53*	-.08	.45**	.02	--	--	--
9. Overall State Self-Esteem	-.39*	-.16	-.16	-.03	-.52**	.64**	-.35	.42*	--	--
10. Social State Self-Esteem	-.32	-.19	-.19	-.06	-.59**	.44*	-.33	.22	.87**	--
11. Relationship Satisfaction	-.08	-.25	-.06	-.08	-.14	.13	-.27	.37	.24	.12

Note: * $p < .05$, ** $p < .01$

Group 2: Rejection Threat Condition x Neutral Social Comparison Condition

Measure	1	2	3	4	5	6	7	8	9	10
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.33	--	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.52*	.01	--	--	--	--	--	--	--	--
4. Fear of Being Single	.54**	.25	.19	--	--	--	--	--	--	--
5. Social Comparison Orientation	.42*	.03	.44*	-.30	--	--	--	--	--	--
6. Trait Self-Esteem	-.64**	-.51**	-.56**	-.32	-.22	--	--	--	--	--
7. Negative Affect	.23	.46*	.28	.09	.25	-.35	--	--	--	--
8. Positive Affect	-.09	.01	-.26	-.30	-.08	.33	.20	--	--	--
9. Overall State Self-Esteem	-.60*	-.22	-.40	-.28	-.25	.63**	-.28	.59**	--	--
10. Social State Self-Esteem	-.72**	-.28	-.45*	-.27	-.34	.61**	-.35	.18	.80**	--
11. Relationship Satisfaction	-.45*	-.43*	-.23	-.04	-.10	.50**	-.25	.30	.52**	.33

Note: * $p < .05$, ** $p < .01$

Group 3: Control Threat Condition x Romantic Social Comparison Condition

Measure	1	2	3	4	5	6	7	8	9	10
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.37	--	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.21	-.65**	--	--	--	--	--	--	--	--
4. Fear of Being Single	.45	-.10	.56*	--	--	--	--	--	--	--
5. Social Comparison Orientation	-.14	-.38	.78*	.29	--	--	--	--	--	--
6. Trait Self-Esteem	-.42*	-.36	.11	-.30	.22	--	--	--	--	--
7. Negative Affect	.03	.03	-.17	-.31	.08	-.06	--	--	--	--
8. Positive Affect	.26	-.07	.34	.02	.00	.42*	.27	--	--	--
9. Overall State Self-Esteem	-.25	-.20	-.04	-.27	-.16	.65**	-.12	.30	--	--
10. Social State Self-Esteem	-.26	-.24	-.10	-.45	-.17	.58**	.02	.27	.89**	--
11. Relationship Satisfaction	-.12	-.01	-.08	-.25	-.25	.24	-.08	.30	.08	.18

Note: * $p < .05$, ** $p < .01$

Group 4: Control Threat Condition x Neutral Social Comparison Condition

Measure	1	2	3	4	5	6	7	8	9	10
1. Attachment Anxiety	--	--	--	--	--	--	--	--	--	--
2. Attachment Avoidance	.53**	--	--	--	--	--	--	--	--	--
3. Relationship-Contingent Self-Esteem	.58**	.28	--	--	--	--	--	--	--	--
4. Fear of Being Single	.69**	.31	.49*	--	--	--	--	--	--	--
5. Social Comparison Orientation	.39*	-.09	.40	.48*	--	--	--	--	--	--
6. Trait Self-Esteem	-.58**	-.22	-.49*	-.54**	-.48*	--	--	--	--	--
7. Negative Affect	.16	.18	.15	.10	.25	-.34	--	--	--	--
8. Positive Affect	-.30	-.05	-.40	-.18	-.08	.17	.12	--	--	--
9. Overall State Self-Esteem	-.39*	-.06	-.45*	-.47*	-.46*	.62**	-.34	.27	--	--
10. Social State Self-Esteem	-.45*	-.04	-.42*	-.42*	-.53**	.57**	-.23	.09	.86**	--
11. Relationship Satisfaction	.01	-.09	.21	.07	.17	.02	-.45*	.07	-.12	-.19

Note: * $p < .05$, ** $p < .01$

Appendix G

Pilot Study (Background and Preliminary Data)

Introduction

The two studies included in my thesis allow for investigation into whether individual difference variables (including attachment orientation, relationship-contingent self-esteem, the fear of being single, orientation towards social comparison, etc.) interact with optimism about future romantic prospects (for single individuals) and relationship threat (for dating individuals) to moderate the extent to which viewing romantic information posted online impact viewers' mood and self-evaluations. However, in such designs, an important variable is not yet addressed: the psychological closeness between the viewer and the person whose information he/she is viewing. As per the self-evaluation maintenance theory (Tesser, 1988), if the domain of comparison is relevant to a person's self-definition, then an individual will feel more threatened if a close friend succeeds in this domain, as opposed to a stranger. Conversely, if the domain of comparison is irrelevant to one's self-definition, then the individual will actually experience a boost in self-evaluation if a close friend succeeds in this domain, due to the phenomenon of basking in reflected glory (Cialdini et al., 1976). Specific to the topic at hand, consider individuals who put great emphasis on the relationships in their lives; people whose self-esteem may be contingent on the success of their relationships. These individuals' self-identities are likely influenced by their current relationship statuses, and consequently, they may be particularly susceptible to changes in self-evaluation after viewing relationship-related information on Facebook. Further, recall that because SNS users are prone to positive self-presentation (Bazarova, Taft, Choi, & Cosley, 2013; Chou & Edge, 2011; Gonzales & Hancock, 2011), most information viewed on Facebook will likely be positive in nature. Taking these two things together, it stands to reason that these individuals will see others' positive romantic content and be prone to drawing upward social comparisons. Furthermore, in applying Tesser's model (1988), one might hypothesize that viewing the information of close friends should be even more impactful than viewing the information of a mere acquaintance.

However, I predict that this may not be the case and that the current domain—romantic social comparison on SNS—will prove to be an exception to Tesser's theory. Specifically, instead of the positive linear relationship between psychological closeness and detriment to self-evaluation the original theory might predict, I hypothesize that a curvilinear trend might instead emerge. While it still logically follows that viewing the romantic content of a friend should be more impactful than viewing that of a mere acquaintance, I believe a discrepancy from the self-evaluation model might arise when comparing the impact of viewing a friend's content, as opposed to the content of a close friend. Indeed, I believe that the latter presents itself as a special case: although an individual's close friend may post romantic content that presents his/her relationship in a favourable light, said individual may be close enough to realize that this portrayal is not entirely veridical. Being close presumably allows one to be privy to a more accurate and honest perspective of the relationship at hand. As such, one may be less threatened

by this content. However, as with before, I hypothesize that any effects of psychological closeness will further interact with individual difference variables such as attachment orientation, relationship-contingent self-esteem, the fear of being single, orientation towards social comparison, and trait self-esteem.

Further, Study Three deviates from the laboratory-based designs of the first two, and employs a more naturalistic paradigm. Although participants in the first two studies were explicitly told that the stimuli (photographs) they viewed were pulled from Facebook, there is much more to the Facebook-browsing experience than photographs. For example, Facebook also allows users to write posts and statuses, as well as comment on and like others' content. Consequently, the results obtained from the first two studies may not be immediately generalizable to Facebook use in the real world. Study Three re-investigates these effects in a naturalistic manner: participants logged onto their own Facebook accounts. In doing so, participants are able to view information posted by people they actually know—allowing for an opportunity to measure the effect of psychological closeness.

In the current study, a given participant logs onto her own Facebook account, navigates to the online profile of either an acquaintance, friend, or close friend (that they knew to be in a dating relationship), and views online romantic content posted by the chosen Facebook friend. However, although such a study design has high ecological validity and affords an opportunity to account for psychological closeness, there are attendant threats to internal validity to be mindful of, predominantly stemming from a number of variables beyond experimental control. For example, it is difficult to predict or control the amount of content a participant may actually be able to access, as there is likely much variance in the extent to which individuals engage in online positive self-presentation or disclose personal information online. It is also possible that external influences may be at play; for example, a long-distance couple may simply have less opportunity to post romantic content. Furthermore, consider that between the three levels of psychological closeness (acquaintance, friend, close friend), varying amounts of romantic content might be available. Indeed, a participant can be aware that a friend or close friend is in a dating relationship even in the absence of online romantic content; however, a participant may only be aware that an acquaintance is in a dating relationship because of the large quantity of online romantic content this acquaintance may post. In sum, the nature of Study Three is such that there is a tradeoff between improved ecological validity and the introduction of threats to internal validity. As a consequence, Study Three was run as a pilot test, in order to gauge feasibility of the current methods in assessing the impact of psychological closeness on online romantic social comparison.

Participants

For this pilot study, participants were 91 female undergraduate students enrolled in a first year introductory psychology course at Queen's University. The same rationale for recruiting only female participants in both Study One and Study Two also applied to the current study. Further, all participants self-reported to single. Dating participants were not included because

recruitment for this population was quite low, such that I projected not being able to recruit a sufficient sample size to conduct proper analyses. This shortage of dating participants was further exacerbated by the fact that this pilot was conducted concurrently with Study Two (for which I recruited exclusively dating participants). For their time, participants received either extra course credit or monetary compensation.

Of the 94 participants who participated, a total of 78 were included in analyses. As in study one, the remaining 16 participants were excluded because they had not completed the prescreening battery of questionnaires. This battery is administered at the beginning of the school year to all students enrolled in the introductory psychology course, and comprises a variety of standardized measures—several of which were crucial in the current study. Of note, this is a sizeable portion of participant exclusions, and resulted in cell sizes of $n = 30$ (close friend condition), $n = 22$ (friend condition), and $n = 26$ (acquaintance condition). Because of these small sample sizes, any results described below should be interpreted as preliminary.

Procedure and Measures

Prescreening measures. At the beginning of the school year, students filled out the prescreening battery of questionnaires, which included measures of attachment orientation (ECR-R), trait self-esteem (RSE), relationship-contingent self-esteem (Relationship-Contingent Self-Esteem Scale), fear of being single (Fear of Being Single Scale), and tendency to engage in social comparison (Scale for Social Comparison Orientation). These are the same scales as were administered in Studies One and Two. See Appendix B to see all scales in their entirety.

Ethics. Upon arrival to the lab, participants' dating statuses were confirmed, and they were provided with a letter of information and consent form to sign (see Appendix A for all ethics documents), both of which were presented electronically via SurveyMonkey.

Condition assignment and Facebook browsing. Prior to arrival to the lab, participants were randomly assigned to one of three psychological closeness conditions: acquaintance, friend, or close friend. Upon arrival to the lab, participants were provided with a slip of paper that corresponded to their assigned condition. Inscribed on the slip of paper were one of three possible definitions: (1) acquaintance - someone who you do not know too well or talk to regularly, (2) friend - someone in your social circle with whom you get along and spend time with on occasion, or (3) close friend - someone you have known for a while, and who you share things with openly. Participants were then told to log onto their own Facebook accounts, and navigate to the Facebook profile of someone who they know to be in a dating relationship, and who matches the definition they were given. They were then directed to browse the chosen profile page at their leisure, taking special care to note any romantic content.

In-lab questionnaires. Participants then completed several questionnaires pertaining to their current mood and state self-esteem. To measure these constructs, the same questionnaires as those used in Studies One and Two were administered (PANAS and SSES). Additionally, participants also completed the scales and measures described below.

Inclusion of Other in the Self Scale (IOS). This is a 1-item scale that presents participants with 7 different pictures, each comprising two circles—one labelled “self”, and the second labelled “other”. In picture one, the two circles are next to one another but not overlapping. Each subsequent picture shows a greater amount of overlap between the two circles than the previous, with picture 7 depicting the greatest degree of overlap. This scale was created to measure one’s perceived closeness with another individual (Aron, Aron & Smollan, 1992). In the current study, participants were asked to indicate which of the pictures best represents how close they feel with the individual whose Facebook profile they viewed. This will serve as a way to verify that participants are indeed choosing Facebook friends consistent with their assigned condition.

Psychological closeness. In addition to the IOS, participants also completed 3 questions asking about how well they know, how often they interact with, and how close they feel with the individual whose Facebook profile they chose to view. These 3 items are answered along on a scale from 1 (*not much beyond name/very rarely/not at all*) to 7 (*a lot/daily/extremely close*).

Viewed content. Participants also answered 10 questions inquiring about the content they viewed. For example, they were asked to guess what percentage of photographs found on the viewed Facebook profile were “couple photos”, as well as share whether they were able to find a relationship status and/or a profile (primary) picture depicting the individual with her partner. Further, participants were asked to rate how satisfied they perceived the viewed relationship to be, how committed the individual and her partner appear, and how accurate they believe the Facebook portrayal of the relationship was. These were answered on a 7-point scale ranging from 1 (*not at all*) to 7 (*completely*).

Results

Data analytic strategy. In this pilot study, I ran several GLMs, each of which specified psychological closeness condition as a categorical independent variable. Further, consider that in the self-evaluation maintenance theory (Tesser, 1988), a key variable is the extent to which an individual bases their self-worth on his/her performance in a specific domain. For the current, study, I decided to interpret higher relationship-contingent self-esteem to be analogous to such a variable. As such, relationship-contingent self-esteem (along with attachment anxiety) were specified in all models as continuous independent variables. Dependent variables of interest in this study were state self-esteem, affect, and participants’ subjective assessments of the quantity of romantic content they were able to access. All main effects and interactions were included.

Preliminary analyses. Prior to conducting inferential statistics, preliminary analyses were conducted on the dataset. First, I checked the validity of participants’ psychological closeness assignments to ensure that participants did not choose a Facebook friend to view at random. To do this, I averaged the three items inquiring participants about how well they knew the viewed individual, how often they interact, and how close they feel their friendship is ($\alpha = .96$). Subsequently, the means of this newly-created psychological closeness variable were assessed for each of the three groups (acquaintance, friend, close friend) and univariate outliers

were identified. As a consequence, a total of 3 participants were removed. Finally, I assessed whether scores differed across the three groups. Indeed, an ANOVA revealed a significant difference, $F(2, 73) = 162.81, p < .001$. Specifically, participants assigned to the acquaintance condition reported being the least psychologically close to the individual whose profile they chose to view ($M = 2.28, SD = .77$), participants in the friend condition reported a moderate level of closeness ($M = 5.48, SD = 1.13$), and participants in the close friend condition reported the highest psychological closeness ($M = 6.43, SD = .72$). Post-hoc tests verified that all pairwise differences were statistically significant. Similarly, an ANOVA assessing participant responses to the IOS yielded similar results, $F(2, 73) = 52.99, p < .001$. This pattern of results indicates that condition assignment was valid—psychological closeness indeed varied across the three groups.

Further, analysis of descriptive statistics revealed that all variables included in preliminary analysis were normally distributed save for negative affect which exhibited a strong positive skew. This is again consistent with expectations, given the averages reported by PANAS creators, as well as with data collected in both Study One and Study Two above.

Effect of psychological closeness, relationship-contingent self-esteem, and attachment anxiety on state self-esteem. If the self-evaluation maintenance holds true in this domain, then I would expect that individuals in the close friend condition with high relationship-contingent self-esteem and high attachment anxiety should be the most negatively affected (i.e., lower state self-esteem), in contrast to those in the friend and acquaintance conditions. However, given that I hypothesize that being close friends with the comparison figure might buffer some negative consequences, I believe that those most negatively affected would instead be individuals in the friend condition.

Overall state self-esteem. With overall state self-esteem as the dependent variable, a significant main effect of attachment anxiety emerged, $F(2, 54) = 15.21, p < .001$. The direction was such that higher attachment anxiety was related to lower overall state self-esteem, relative to lower attachment anxiety—which is expected. Further, a three-way interaction between attachment anxiety, relationship-contingent self-esteem, and closeness condition emerged, $F(2, 54) = 3.70, p = .031$. This interaction was decomposed by splitting the data by closeness conditions, and assessing the two-way interaction between attachment anxiety and relationship-contingent self-esteem within each condition.

In the close friend condition, the two-way interaction did indeed emerge as significant, $F(1, 18) = 4.59, p = .046$. Specifically, among participants with low levels of relationship-contingent self-esteem, there was no relationship between attachment anxiety and overall state self-esteem. In contrast, at moderate levels of relationship-contingent self-esteem, a negative correlation between attachment anxiety and overall state self-esteem emerged ($B = -.41, SE = .10, p < .01$). This negative correlation, however, was strongest among participants with high levels of relationship-contingent self-esteem ($B = -.62, SE = .16, p < .01$).

In the friend condition, the two-way interaction between attachment anxiety and relationship-contingent self-esteem did not reach statistical significance.

Finally, in the acquaintance condition, the two-way interaction again emerged as significant, $F(1,20) = 5.00, p = .037$. Interestingly, the direction of the interaction is seemingly opposite to the one found within the close friend condition. Specifically, among participants with low levels of relationship-contingent self-esteem, higher attachment anxiety related to lower overall state self-esteem ($B = -.34, SE = .13, p = .016$). Among participants with moderate levels of relationship-contingent self-esteem, a similar pattern emerged, but to a weaker extent ($B = -.19, SE = .09, p = .057$). In contrast, among participants with high levels of relationship-contingent self-esteem, no significant relationship emerged between attachment anxiety and overall state self-esteem.

Everything taken together, this pattern of findings is more consistent with Tesser's self-evaluation maintenance theory than my hypotheses. Indeed, those who highly identify with the domain—as reflected in higher relationship-contingent self-esteem—are most affected by comparisons against individuals who they are closer with, as opposed to acquaintances. Inconsistent with my hypothesis, there is no evidence that any buffering effect of being in the close friend condition.

Social state self-esteem. In contrast to the significant effects that emerged in predicting overall state self-esteem, models incorporating social state self-esteem as the dependent variable of interest were not revealed to be significant, $F(2, 54) = .89, p = .416$. However, a main effect of attachment anxiety was significant, $F(2, 54) = 12.56, p = .001$.

Effect of psychological closeness, relationship-contingent self-esteem, and attachment anxiety on affect. If the self-evaluation maintenance holds true in this domain, then I would expect that individuals in the close friend condition with high relationship-contingent self-esteem and high attachment anxiety should be most negatively impacted (i.e., higher negative affect and lower positive affect), in contrast to those in the friend and acquaintance conditions. However, given that I hypothesize that being close friends with the comparison figure might buffer some of the negative consequences, I believe that those most negatively affected will instead be individuals in the friend condition.

Negative affect. Although a main effect of attachment anxiety was found, $F(2, 54) = 4.23, p = .045$, the three-way interaction between closeness, relationship-contingent self-esteem, and attachment anxiety did not emerge as significant, $F(2, 54) = .89, p = .387$.

Positive affect. No main effects were significant. Similarly, the expected three-way interaction also did not reach statistical significance, $F(2, 54) = .33, p = .724$.

Effect of psychological closeness, relationship-contingent self-esteem, and attachment anxiety on subjective assessments of the quantity of romantic content viewed. During the experiment, participants were asked about their thoughts on the amount of romantic content they were able to find on their chosen friend's Facebook profile page. Answers were given on a scale of 1 (*not enough romantic content*) to 7 (*too much romantic content*). I used this variable as a dependent variable in a GLM with psychological closeness, relationship-contingent self-esteem, and attachment anxiety specified as independent variables.

Interestingly, a marginal two-interaction between closeness condition and attachment anxiety emerged, $F(2, 54) = 2.75, p = .073$. This effect was such that only among those in the close friend condition, participants with higher attachment anxiety were more apt to rate their friend as posting too much romantic content, relative to participants lower in attachment anxiety ($B = .22$). In contrast, among those in the friend condition, participants higher in attachment anxiety were more apt to rate their friend as not posting enough romantic content, relative to participants lower in attachment anxiety ($B = -.53$). In the acquaintance condition, a trend similar to that seen in the friend condition was found, but was slightly stronger ($B = -.78$).

Discussion

Given the small and under-powered sample size, much caution should of course be exercised in placing confidence in the above-described effects. However, these preliminary results do suggest that, for the most part, romantic social comparison on Facebook do indeed follow Tesser's self-evaluation maintenance theory. In particular, only in the close friend condition did relationship-contingent self-esteem and attachment anxiety interact to be negatively related to overall state self-esteem. Further, it is again only the close friend condition wherein individuals with higher attachment anxiety (in contrast to lower attachment anxiety) rated their Facebook friend as posting too much romantic content.

At present, there is no evidence in support for the hypothesis that those in the close friend condition are buffered from negative consequences by potentially being privy to the "behind-the-scenes" perspective on the depicted relationship. However, this hypothesis is contingent on the idea that individuals in the close friend condition perceived the portrayed relationship as being inaccurate. This was not the case, as accuracy ratings did not vary significantly between the three groups. However, again keeping in mind the very small sample size, more data should be collected before making drawing any firm conclusions.