

Dispositional Attachment Moderates the Effect of Observing Ostracism on Observers' Views
of Human Nature and Endorsement of Aggressive Norms

by

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A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

in partial fulfilment of the requirements of the degree of

MASTER OF ARTS

Department of Psychology

University of Manitoba

Winnipeg

Abstract

Individuals frequently witness acts of ostracism (e.g., in schools or in workplaces). Research examining the impact of vicarious ostracism is still in its nascent stages and has not yet explored how observing ostracism might affect observers' perceptions of human nature and antisocial inclinations. And only to a limited degree have the moderators of the effects of witnessing ostracism been identified. The present study sought to fill these gaps in the literature by determining whether observing ostracism might lead observers to subsequently perceive human nature in general less favorably (i.e., to see people as more immoral and less trustworthy) and heighten their antisocial inclinations. It further examined if these effects were moderated by observers' dispositional attachment. I hypothesized that, after witnessing ostracism or inclusion relative to a neutral control condition, anxious attachment would predict reduced favorability of observers' perceptions of human nature and increased antisocial inclinations. In contrast, avoidant attachment was expected to predict enhanced favorability of observers' views of human nature and reduced antisocial inclinations, but only after witnessing ostracism. Six hundred and twenty-seven university students observed another individual be ostracized or included in an online game of ball-toss or anticipated an upcoming game. Subsequently, I assessed their views of human nature as well as their antisocial inclinations. Results partially supported hypotheses. After observing ostracism observers low in attachment anxiety were marginally more likely to report less favorable views of human nature (and a similar trend emerged after observing inclusion), while witnessing ostracism significantly increased the antisocial inclinations of observers high in attachment avoidance. Discussion focuses on the meaning and theoretical and practical implications of these results.

Acknowledgements

I would like to express my sincerest thanks to my advisor Dr. Jacquie Vorauer for all her assistance and guidance in the development of this research and the preparation of this manuscript. I would also like to thank my committee members, Dr. Jessica Cameron and Dr. Brianna Caza for their helpful and instructive feedback on the proposal. Thanks also to Matthew Quesnel for his technical expertise and help in setting up and troubleshooting several of the study tasks. Last, I would like to thank my wife, Avery and my family and friends for their support and encouragement.

This research was supported by a Canada Graduate Scholarship from the Social Sciences and Humanities Research Council of Canada and a Tri Council Master's Supplement Award from the University of Manitoba.

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Dispositional Attachment Moderates the Effect of Observing Ostracism on Observers' Views of
Human Nature and Endorsement of Aggressive Norms

Developing connections and relationships with one another is a defining characteristic of being human. We form bonds with others early and continue to do so over the course of our lives. These relationships are the source of some of our greatest triumphs as well as our deepest sorrows and conflicts. Due to the importance of social relationships, the loss of such connections, such as by outright rejection or more insidiously by ostracism (i.e., being ignored or excluded) is distressing and painful (e.g., Williams, 2009). Unfortunately, instances of ostracism are common, occurring frequently in schools or in workplaces (Fox & Stallworth, 2005; Wang, Iannotti, & Nansel, 2009). However, episodes of ostracism often involve not only targets and perpetrators, but also outside observers (Atlas & Pepler, 1998; Craig & Pepler, 1997; Rivers, Poterat, Noret, & Ashurst, 2009).

Research on the effects of witnessing ostracism is relatively limited and still emerging (e.g., Wesselmann, Williams, & Hale, 2013). To date, this literature has largely focused on examining the impact of vicarious ostracism on observers' affective states and well-being, as well as their propensity to assist or compensate the ostracized target or punish the perpetrators (e.g., Wesselmann, Bagg, & Williams, 2009; Will, Crone, van den Bos, & Guroglu, 2013). Although these are certainly important outcomes, there is a gap in our knowledge of how observing ostracism might affect observers' thoughts and perceptions of others. And, no research has directly evaluated whether witnessing ostracism might stimulate hostile, antisocial inclinations (thoughts, desires, and so forth) in observers. This is a regrettable oversight as it possible that observing such negative treatment might elicit antisocial inclinations by leading observers to feel threatened and angry, or by activating negative views of others that normalize

or justify aggression and other forms of antisocial behavior (Rotter, 1980; Veldhuis, Gordijn, Veenstra, & Lindenberg, 2014; Wenzel, Schindler, & Reinhard, 2017). Clearly such reactions could propel observers to aggress against or ostracize others. Therefore, an act of ostracism, if witnessed, might spread or spiral to harm uninvolved third-parties (Andersson & Pearson, 1999). Thus, observing ostracism might perpetuate ostracism and other forms of negative interpersonal behavior. Finally, only to a minimal degree have the moderators of the effects of vicarious ostracism been evaluated. The present study sought to fill these gaps by determining whether observing ostracism, and perhaps also inclusion in some cases, might reduce the favorability of observers' views of human nature and increase their antisocial behavioral inclinations. It also examined whether individual differences in observers' dispositional attachment might moderate these effects.

My main proposal is that, as a result of their divergent modes of affect regulation (e.g., Mikulincer, Shaver, & Pereg, 2003), observers with an anxious or avoidant attachment style will respond differently to observing ostracism and inclusion. On the one hand, I will argue that anxiously attached observers will display strong, negative affective reactions to viewing both ostracism and inclusion, and that this distress will, by activating their largely negative attitudes, perceptions, and expectations about others (e.g., Collins & Read, 1990; Rowe and Carnelley, 2003; Hofstra, van Oudenhoven, & Buunk, 2005; Skarzynska & Radkiewicz, 2014), lead them to subsequently report less favorable views of human nature and more antisocial inclinations. I will further suggest that, although avoidantly attached observers may be negatively affected by observing ostracism, they will inhibit and suppress their reactions, such that their also largely negative perceptions and expectations of others (e.g., Collins & Read, 1990; Rowe and Carnelley, 2003; Hofstra, van Oudenhoven, & Buunk, 2005; Skarzynska & Radkiewicz, 2014),

will become increasingly inaccessible. Ultimately then they should report more favorable views of human nature and less antisocial inclinations. However, as will be seen these expectations were not entirely borne out by the obtained results.

In the ensuing sections of the current study I describe: (a) several theoretical conceptualizations of individuals' beliefs about human nature or humanity, with a particular emphasis on what these conceptualizations have in common, and their consequences, (b) theory and research on attachment and its influence on individuals' perceptions of others and responses to threatening (and neutral) situations and stimuli, (c) ostracism and its affective and behavioral effects on targets and especially observers, as well as the factors that moderate these effects, (d) the objectives and hypotheses of the present study and their rationale, (e) the method that was employed to test those predictions, and (f) the results that were obtained. I conclude with a discussion of the meaning and implications of the results of this study, as well as an examination of its limitations, and potential pathways for future research.

Beliefs about Human Nature and Humanity

Individuals often contemplate and make judgements about the characteristics that define specific others. One may wonder, for instance, if the realtor chosen to sell one's home is honest, if a potential romantic partner is trustworthy, or if one's work colleagues are dependable. However, individuals not only reflect on the characteristics of particular others, they also acquire, apply, and rely upon broad assumptions and beliefs about the attributes that all humans in general possess (i.e., human nature), as well as attitudes about whether humanity itself is "good" or "bad" (e.g., Luke & Maio, 2009; Wrightsman, 1974). The assumptions and beliefs held by individuals about the defining characteristics of human nature, or humanity more broadly, have been explored by a variety of theorists using several different labels (Wrightman,

1974; Janoff-Bulman, 1989; Leung et al., 2002; Luke & Maio, 2009). Janoff-Bulman (1989) utilized the term *assumptive worlds* to refer to the basic, broad, abstract schemas that organize our expectations about ourselves and the world and allow us to effectively interface with our environments. One primary category of our assumptive worlds is our beliefs about the benevolence of the world: Whether the world is a positive or negative place. Janoff-Bulman further divided this category into separate, but highly related beliefs about the benevolence of the impersonal world and the benevolence of people. The former denotes beliefs about whether the world itself is good rather than evil and whether good events and outcomes typically outweigh the bad. The latter refers to beliefs about whether the people who inhabit the world are or are not, overall, fundamentally good, kind, caring, and helpful (Janoff-Bulman, 1989).

Wrightman (1974, 1991) wrote about *philosophies of human nature*, defined as general beliefs or attitudes about all people and the attributes they might possess or the ways they might behave. Two central facets of Wrightman's (1974, 1991) philosophies of human nature are cynical beliefs about people as deceitful, untrustworthy, dishonest, and hypocritical, and beliefs about others as typically good, moral, unselfish, helpful, and genuinely concerned about others' welfare. As a result, these philosophies are highly similar to Janoff-Bulman's (1989) benevolence of the world category of the assumptive world, although with more of a focus on human entities rather than the world at large.

At the pancultural level, Leung and colleagues (2002) identified, in Asian, North and South American, and Western European samples, various *social axioms* or "generalized beliefs about oneself, the social and physical environment, and the spiritual world" (p. 289). Mirroring Wrightman's (1974, 1991) philosophies of human nature, among these social axioms are cynical beliefs which, according to Leung and colleagues, reflect negative views of others (e.g., as

exploitative, arrogant, easily corrupted, selfishly-motivated, and so on), social institutions (e.g., as biased), certain groups, and the importance of moral and ethical standards (e.g., the ends justify any means).

While the former theorists described beliefs about all humans, they all generally described beliefs about the specific qualities or attributes humans possess (e.g., trustworthiness or helpfulness). In contrast, Luke and Maio (2009) developed the construct of *humanity-esteem* to represent individuals' broadest attitudes about, and overall evaluation of, the positivity or negativity of humanity itself. Humanity-esteem reflects both affective (emotional responses toward people) and cognitive components (e.g., stereotypical beliefs about the attributes people possess or the values they endorse), yet is distinct from self-esteem and specific beliefs about humans (Luke & Maio, 2009). Thus, individuals may possess general, abstract attitudes about humanity or humankind per se in addition to beliefs about the specific characteristics of humans.

In sum, a variety of different, yet overlapping concepts have been proposed to capture individuals' general beliefs about human nature or humanity. Despite the fact that some of these conceptualizations diverge in their focus – identifying individuals' beliefs about the specific attributes possessed by all humans or their beliefs about humankind itself – common among them is the theme that the beliefs individuals hold contain an evaluative component. That is, each of these conceptualizations acknowledge that individuals' beliefs, whether they refer to the defining characteristics of human nature or more broadly to humanity, can be either positively or negatively valenced. Thus, individuals' may ultimately endorse favorable or unfavorable beliefs about or views of human nature or humanity.

Consequences of Beliefs about Human Nature

The favorability of a person's beliefs about human nature has potentially wide-ranging consequences in both children and adults. More specifically, beliefs about human nature have been linked to individuals' physical health, psychological well-being, income attainment, and intra-and-interpersonal functioning, including the development of self-control as well as the experience of antisocial thoughts and engagement in aggressive, antisocial behaviors (e.g., Bradshaw & Hazan, 2006; Chen et al., 2016; Cole, 2001; Michaelson & Munakata, 2016; Izawa et al., 2011; Stavroca & Ehlebracht, 2016). For instance, those who endorse more cynical beliefs about people (e.g., as selfish and less reliable and honest) are at a higher risk of suffering acute myocardial infarction (i.e., a heart attack), even after controlling for traditional biological risk factors (e.g., smoking or hypertension) and have lower incomes than those who have more positive attitudes (Izawa et al., 2011; Stavroca & Ehlebracht, 2016). In terms of intra-and-interpersonal outcomes, perceptions of trustworthiness influence the extent to which children delay gratification (i.e., exert self-control) in the marshmallow test (a potent predictor of future life outcomes), with children interacting with an ostensibly untrustworthy experimenter being less likely to resist eating the marshmallow, and in adults, a negative association has been reported between believing one's romantic partner is dishonest or deceptive and feelings of relationship satisfaction and commitment (Cole, 2002; Michaelson & Munakata, 2016).

Most relevant to the present study, however, possessing negative views of others (e.g., as dishonest, unreliable, untrustworthy, and unfriendly) predicts greater feelings of anger, more hostile thoughts, and the performance of a variety of aggressive, antisocial behaviors (including stealing, lying, cheating, physical and verbal aggression, and acting uncooperatively; Bradshaw & Hazan, 2006; Burks, Laird, Dodge, Pettit, & Bates, 1999; Deutsch, 1960; Jones, Miller, & Lynam, 2011; Rotter, 1980; Twenge et al., 2007; Wrightsman, 1974). Taken together, these

studies indicate that individuals' beliefs about human nature, and the positivity and negativity of these beliefs, are powerful determinants of a variety of important psychological, physical, and social outcomes. In particular, the relationship between negative beliefs about human nature and aggressive, antisocial thoughts and behaviors suggests that any situation, such as observing ostracism (and perhaps inclusion), if it makes these beliefs more salient or accessible has the potential to incline individuals to perceive and act toward others in an antisocial manner, perhaps because their negative beliefs lead them to perceive antisocial thoughts and actions as normative, deserved, or necessary (e.g., to avoid being taken advantage of; Deutsch, 1960; Rotter, 1980; Wenzel et al., 2017). Ultimately, the repeated activation of such negative beliefs and associated antisocial inclinations and behaviors, if it engenders reciprocal antisocial behavior by others, has the potential to create a self-fulfilling prophecy that might strengthen and perpetuate an individual's pessimistic view of human nature and propensity to think and act antisocially (Kelley & Stahelski, 1970).

Attachment Theory

A person's general beliefs about human nature likely develop early in life through interactions with close others, particularly their caregivers (e.g., Wrightsman, 1974). Attachment theory, by outlining how individuals connect, relate, and form bonds with others, provides a strong framework for understanding how people's views of others might emerge. In addition, because attachment theory discusses how experiences with others influence individuals' perceptions and expectations about themselves and others, and how individuals may respond to emotionally evocative events and stimuli, it also provides a basis for conceptualizing how, and to what extent, individuals and their beliefs may be affected by witnessing ostracism.

Attachment theory posits the existence of a universal, biologically ingrained behavioral system – the *attachment system* – that directs behavior in such a way as to ensure survival and later reproductive success (for a review of attachment theory and research, see Mikulincer & Shaver, 2016). The major goal of the attachment system is to maintain a sense of comfort and safety, or *felt security*. The primary strategy for maintaining felt security is *proximity seeking*, whereby an individual endeavors to develop or sustain physical or symbolic (i.e., mental) contact and closeness to an *attachment figure*. Attachment figures are individuals who provide protection and relief during times of distress or threat, and in infancy and childhood are often the primary caregivers.

Attachment Working Models

Underlying the operation of the attachment system are a variety of cognitive-affective mental representations or *working models* that develop out of interactions with early attachment figures (Collins, Guichard, Ford, & Feeney, 2004; Mikulincer & Shaver, 2016). Attachment-related working models are theorized to contain two main components. The first is information about the availability, reliability, responsiveness, and trustworthiness of attachment figures, especially during bids for proximity. Information about the responsiveness, reliability, and so forth of attachment figures defines an individual's working model of others. The second component is information regarding the self as worthy or not of love and care. This information defines an individual's working model of self. Working models are thought to guide individuals' evaluations and interpretations of the world and are particularly seen as serving a predictive function, in that they provide a basis for anticipating and understanding how the self and others will or should behave in specific situations (Collins et al., 2004). Attachment-related working models initially code an individual's interactions (and the outcome of those interactions) with

specific attachment figures. Over time, with repeated experience with these figures, and repeated activation of the associated working models, an individual's working models become increasingly abstracted, generalized, and stable, solidifying into a hierarchical network consisting of relationship-specific working models (e.g., dating partner "Cynthia"), organized under domain-specific working models (e.g., romantic relationships), which are in turn nested under more general working models (e.g., all close relationships; Collins et al., 2004; Mikulincer & Shaver, 2016; Overall, Fletcher, & Friesen, 2003).

Due to their relative stability, attachment theorists claim that the working models that are formed during childhood continue to influence beliefs, expectations, perceptions, and behaviors across the lifespan (Brumbaugh & Fraley, 2006; Collins et al., 2004; Hazan & Shaver, 1987). Importantly, however, working models are theorized (and have been empirically demonstrated) to exert their effects in a *context-congruent* manner (Sibley & Liu, 2006). That is, working models, whether general, domain-specific, or relationship-specific, should be more strongly associated with variables that occur at a similar or congruent level of specificity (Cozzarelli, Hoekstra, & Bylsma, 2000; Klohnen, Weller, Luo, & Choe, 2005; Pierce & Lydon, 2001; Sibley & Liu, 2006; Sibley & Overall, 2008b). For example, relationship-specific working models should be better predictors of outcomes in corresponding relationships, whereas general working models should be better predictors of more broad-level, abstract outcomes (e.g., Klohnen et al., 2005). In general, attachment theory predicts that early attachment-related experiences, and the self-and-other-perceptions that develop from them, should impact how individuals view and act toward others beyond their caregivers, such as potential romantic partners, friends, or even strangers. More specifically in the context of the present study, individuals' reactions to witnessing the outcome of an interaction between unknown others, particularly in terms of how it

affects their views of human nature, a fairly abstract construct, should be most strongly predicted by their general working models.

Dispositional Attachment Style

Individual differences in the typical expression and operation of the attachment system, which defines an individual's particular *attachment style*, reflect the structure and content of an individual's working models (Collins et al., 2004; Mikulincer & Shaver, 2016). More specifically, an individual's attachment style results from their most commonly or chronically available and accessible working models, which is also often their most general working model (Collins & Allard, 2001; Gillath, Hart, Nofle, & Stockdale, 2009; Mikulincer & Shaver, 2016). Attachment styles have been conceptualized and measured in a number of different ways, but are currently viewed as falling along two main dimensions; *attachment-related anxiety* and *attachment-related avoidance* (Collins et al., 2004; Hazan & Shaver, 1987; Mikulincer & Shaver, 2016). Individuals high in attachment anxiety heavily seek closeness and support from attachment figures, while simultaneously worrying that because these figures do not value them they are likely to reject or abandon them. Interactions with attachment figures who are inconsistent in providing support may contribute to the development of attachment anxiety. Those high in attachment avoidance are uncomfortable with and wish to avoid intimacy and interdependence with attachment figures, preferring distance and self-reliance. Avoidant attachment may develop when attachment figures are rejecting or unwilling or unable to provide assistance during periods of distress. High levels of attachment-related anxiety or avoidance define an *insecure attachment style*. Individuals low on both attachment anxiety and avoidance are considered securely attached. Such individuals have had encounters with responsive and supportive attachment figures. Therefore, securely attached, in contrast to avoidant and anxious

individuals, are not concerned with being abandoned by and are thus happy to depend on attachment figures, and feel valued by them (Collins et al., 2004; Hazan & Shaver, 1987; Mikulincer & Shaver, 2016).

The two dimensions of attachment can also be interpreted more directly with reference to the particular working models that underlie them (Bartholomew, 1990; Bartholomew & Horowitz, 1991; Mikulincer & Shaver, 2016). Specifically, Bartholomew and others (Bartholomew, 1990; Brennan, Clark, & Shaver, 1998; Griffen & Bartholomew, 1994; Mikulincer & Shaver, 2016) have equated the anxious dimension with an individual's model of self and the avoidant dimension with an individual's model of other. The valence of these models can range from positive to negative. An individual with a positive model of self considers themselves as worthy of love, while one with a negative model of self does not. A person with a positive model of others sees others as trustworthy and reliable, whereas one with a negative model of others views others as untrustworthy, rejecting, and uncaring (Bartholomew, 1990; Bartholomew & Horowitz, 1991). According to Bartholomew (1990), when crossed, the various working models (i.e., positive vs. negative self and other) define four categories of attachment. In addition to identifying a secure and anxious attachment style, the former defined by a positive model of both self and other, and the latter defined by a negative model of self and a positive model of other, Bartholomew's four-category model further refines the conceptualization of avoidant attachment by dividing it into two distinct types. The first type of avoidance, labeled dismissing avoidance, is defined by a positive model of self and a negative model of other. The dismissing avoidant maintain a positive self-image in the face of negative experiences (e.g., involving rejection) with attachment figures by stressing independence and denying the importance of close relationships and intimacy. The second type of avoidance, designated fearful

avoidance, is delineated by a negative model of both self and other. The fearfully avoidant have failed to maintain a positive self-image, and although unlike the dismissing avoidant, they desire social connections, largely as a way to bolster their pessimistic self-concepts, their views of others as untrustworthy and rejecting leads them to avoid any situations or relationships which might result in their rejection (Bartholomew, 1990).

Attachment Insecurity and Negative Views of Others

Conceptualizing attachment in terms of the working models individuals possess suggests that only those high in avoidance would be likely to have negative views of others. However, although empirical research has largely confirmed the highly avoidants' pessimistic evaluation of others, it has additionally indicated that individuals high in anxiety also tend to appraise others negatively (e.g., Baldwin, Fehr, Keedian, Seidel, & Thomson, 1993; Catlin & Epstein, 1992; Collins & Read, 1990; Hazan & Shaver, 1987; Mikulincer, 1998b; Rowe & Carnelley, 2003). More specifically, various studies indicate that feelings of attachment insecurity (anxiety or avoidance) influence how individuals view their attachment figures, particularly romantic partners. For example, insecure in comparison to secure individuals report less trust in their current romantic partners; evaluating them as less dependable and predictable, and have greater accessibility to memories of instances in which they (as well as other attachment figures, e.g., parents) had violated their trust (Collins, 1996; Collins & Read, 1990; Mikulincer, 1998b; Simpson, 1990). Moreover, insecure, in contrast to secure individuals appear to generally hold less positive, and more negative interpersonal expectations about their romantic partners; the insecure believe, for instance, that they would be hurt or rejected if they trusted or attempted to get close to their partners, and also tend to make more negative, hostile attributions for their partners' behavior (Collins, 1996; Baldwin et al., 1993, Study 1; Mikulincer, 1998a).

Especially relevant to the present study, however, insecure individuals tend to not only view significant others negatively, but also others more generally, as well as the larger social world. For instance, both anxious and avoidant individuals, relative to secure individuals, report more distrust in others as well as greater doubts about their trustworthiness (Collins & Read, 1990, Study 2; Hofstra, van Oudenhoven, & Buunk, 2005). They are also less likely to believe that “people are generally well-intentioned and good-hearted” (Hazan & Shaver, 1987, p. 519). Anxious persons also tend to perceive others as less altruistic, while avoidant individuals evaluate others as less dependable and as having less integrity (Collins & Read, 1990, Study 2). In addition, the same negative interpersonal expectations held by insecure individuals about their romantic partners (e.g., that they would be hurt if they trusted them; Baldwin et al., 1993) appear to extend to people in general (Rowe and Carnelley, 2003). More broadly, attachment anxiety and avoidance and experiences with parental rejection and the discouragement of independence, experiences that may characterize insecure individuals’ interactions with parents, predict more negative basic beliefs about the world (akin to Janoff-Bulman’s assumptive worlds) as well as more negative beliefs about social relations. These include beliefs about the world as dangerous, others as untrustworthy, and life as a zero-sum game, although these beliefs may be most negative among dismissing avoidants (Catlin and Epstein, 1992; Skarzynska & Radkiewicz, 2014).

Why might anxious individuals’ views of significant others, others more generally, and the broader social world often be negative? Anxious individuals have likely had interactions with attachment figures who have been inconsistent in providing support, sometimes being reassuring and caring and at other times being cold and rejecting (Collins et al., 2004; Mikulincer et al., 2003; Mikulincer & Shaver, 2016). Anxiously attached persons tend to interpret the insensitive

behavior of their attachment figures as an indication that they are not worthy of love. As a result, anxiously attached individuals often develop a highly negative model of self. Beyond suggesting that they are not deserving of the care and support of others, the negative self-views of anxiously attached individuals also lead them to feel helpless as well as fear being disliked, rejected, or abandoned (Bartholomew, 1990; Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994; Collins et al., 2004; Mikulincer et al., 2003; Mikulincer & Shaver, 2016). Chronically feeling helpless and anticipating negative responses from others may result in individuals high in attachment anxiety perceiving and believing that the world is dangerous, and that other people are untrustworthy, selfish, and ill-intentioned (Hofstra et al., 2005; Skarzynska & Radkiewicz, 2014). Thus, it is perhaps the negative self-conceptions engendered by the capricious behavior of their attachment figures that lead anxiously attached individuals to frequently view others in a pessimistic way.

Attachment Anxiety and Hyperactivating Modes of Affect Regulation

Beyond attachment-related differences in beliefs, expectations, and perceptions of others, attachment security and insecurity are also differentially associated with the strategies individuals utilize to manage or regulate their emotions (Mikulincer et al., 2003; Mikulincer & Shaver, 2016). As a consequence of the inconsistent behavior of their attachment figures – sometimes responsive, sometimes not - anxiously attached individuals employ *hyperactivating* strategies (Mikulincer et al., 2003; Mikulincer & Shaver, 2016). Hyperactivating strategies involve an amplification of proximity seeking behaviors because these behaviors have, at times, been effective in eliciting the support of attachment figures. Thus, anxiously attached persons vigorously attempt to develop or maintain closeness to and attention from romantic partners and other attachment figures. Moreover, due to their general sense of helplessness and perceived

inability to overcome distressing events alone, the hyperactivating strategies of people high in attachment anxiety lead them to excessively monitor and appraise their environment for threats. Their uncertainty also leads them to ruminate on and exaggerate the severity and consequences of these threats, as well as the negative affective reactions they elicit (Mikulincer et al., 2003; Mikulincer & Shaver, 2016). In general, the hyperactivation of anxiously attached individuals results in the easy identification of threats and intense, distressing, negative emotional responses to them.

Prior work has confirmed the hyperactivation of anxiously attached individuals' attachment systems and associated exaggeration of distress in response to threatening events. For example, Mikulincer and Florian (1998) reviewed evidence indicating that anxiously attached, relative to secure, individuals not only display heightened negative emotional reactions to personal failure, chronic pain, and major life transitions (e.g., becoming a parent), but they also appraise these events as more threatening and themselves as less able to cope with them. Moreover, anxiously attached individuals also appear to more easily recall negative emotional memories (esp. experiences of anxiety and sadness) than secure or avoidant persons and experience these memories with more intensity (Mikulincer & Orbach, 1995). In a more direct examination of the (hyper)activation of anxiously attached individuals' attachment systems, Mikulincer and colleagues (Mikulincer, Birnbaum, Woddis, & Nachmias, 2000; Mikulincer, Gillath, & Shaver, 2002) assessed the cognitive accessibility of thoughts related to proximity and distance, or the accessibility of names of attachment figures through reaction times in a lexical decision task. In this task, individuals are asked to determine as quickly as possible if a presented stimulus is a word or a nonword. Faster identification of a certain stimulus (e.g., a name of an attachment figure) as a word indicates that thoughts and themes connoted by this stimulus are

salient. Following both a threatening (e.g., failure) and a neutral prime, anxiously attached individuals demonstrated enhanced accessibility to proximity and distance concerns, and names of attachment figures (as measured through faster reaction times).

Hyperactivating reactions have also been documented as consequence of threats that are social in nature. For instance, attachment anxiety predicts greater distress in response to, as well as a tendency to overreact to and escalate relationship conflicts (Campbell, Boldry, Simpson, & Kashy, 2005; Simpson, Rholes, & Philips, 1996). Moreover, anxious attachment is positively related to the experience of negative mood, anger, and somatic symptoms after imagining a romantic rejection (Besser & Priel, 2009). Similarly, when asked to think about negative relationship scenarios (e.g., conflict or breakup) anxiously attached relative to less anxiously attached individuals display greater activation in brain regions associated with emotional arousal and less activation in regions associated with emotion regulation (Gillath, Bunge, Shaver, Wendelken, & Mikulincer, 2005).

Attachment Avoidance and Deactivating Modes of Affect Regulation

In contrast to anxiously attached individuals who have developed hyperactivating modes of affect regulation as a result of the unpredictable and unreliable behavior of their attachment figures, the attachment figures of avoidantly attached persons have been consistently rejecting. Therefore, avoidantly attached individuals have learned that proximity seeking is not only ineffective, but is also often painful (Mikulincer et al., 2003; Mikulincer & Shaver, 2016). As a result, avoidantly attached persons employ *deactivating* strategies. Deactivating strategies are primarily concerned with downregulating the activation of the attachment system and associated negative emotional states that arise from perceptions of attachment figures as unavailable. This strategy involves the downplaying of attachment-related concerns, and compels avoidant persons

to restrict dependence, closeness, and reliance on others, and instead seek radical self-sufficiency. Moreover, due to their desire to limit the experience of negative emotions, the deactivating strategies of avoidantly attached individuals lead them to rapidly disengage their attention from threatening situations and stimuli, as well as actively and effortfully suppress any unpleasant affective reactions these stimuli evoke (Chun, Shaver, Gillath, Mathews, & Jorgensen, 2015; Mikulincer et al., 2003; Mikulincer & Shaver, 2016). Overall, the deactivation of avoidant individuals results in the defensive, self-protective inhibition of negative emotional responses to threats.

The defensive deactivation of the attachment system and the concomitant suppression of negative emotions utilized by avoidantly attached individuals has been documented in a variety of studies. Avoidant persons, relative to both anxious and secure, have difficulty accessing memories of experiences of anxiety and sadness and they often appear able to inhibit threatening attachment-related thoughts (e.g., thoughts of losing a relationship partner) and associated emotional and physiological arousal (Fraley & Shaver, 1997; Mikulincer, Dolev, & Shaver, 2004; Mikulincer & Orbach, 1995). They also display deactivation of the attachment system when encountering attachment-related social threats. For example, avoidantly attached individuals report less emotional distress following dissolution of romantic relationships (Simpson, 1990). Moreover, after being primed with the word separation, avoidant individuals evidence both slower reaction times in identifying names of attachment figures as words in a lexical decision task and faster response times to identifying the color in which these same names are printed in a Stroop task (indicating reduced saliency of attachment concerns; Mikulincer et al., 2002, Study 2 and Study 3). Relatedly, when asked to think of a time a romantic partner hurt their feelings, higher attachment avoidance predicted reduced perceptions

of this event as threatening, as well as fewer feelings of rejection, less likelihood of crying, and more defensive or hostile reactions (e.g., distancing self from partner; Cassidy, Shaver, Mikulincer, & Lavy, 2009).

Research suggests that underlying the deactivating strategies of avoidantly attached individuals is the effortful disengagement of attention from threatening stimuli. This disengagement functions to limit the processing and encoding (in memory) of features of these stimuli, which ultimately serves to reduce any negative emotional impact they may have. Evidence for this attentional disengagement comes from several studies. For example, Fraley, Garner, and Shaver (2000) had participants listen to an interview describing attachment-relevant themes and then presented them with cued-recall questions about it. Results indicated that, although more avoidantly attached individuals forgot information about the interview at a similar rate as less avoidant persons, the more avoidant individuals initially encoded less information (as assessed by poorer performance on the recall questions). To rule out the possibility that avoidant individuals may actually encode attachment-relevant information, but are just unable or unmotivated to recall it, Fraley and Brumbaugh (2007), utilizing a similar methodology, tested recall on both implicit (i.e., a word-fragment completion task) and explicit measures, and offered a monetary incentive for correct answers. They found that, despite monetary incentives, higher avoidant attachment predicted poorer recall on both types of measures of the interview. Similarly, Edelstein (2006) reported that highly avoidant individuals, compared to less avoidant persons, displayed working memory deficits (an indicator of reduced attention and poor processing and encoding) for both positive and negative attachment-related words, but not emotional or neutral words. Finally, Chun and colleagues (2015) found that more avoidant individuals only attended to threatening negative stimuli (i.e., contemptuous faces) when these

stimuli were presented for a very short time (100 milliseconds [ms]), and quickly stopped attending to them if they were presented for longer. Thus, although avoidant individuals are aware of and initially vigilant to potentially threatening and emotionally evocative attachment-related information and stimuli they quickly motivate and expend cognitive resources to disengage from them in order to prevent such stimuli from activating their attachment system and eliciting unwanted emotional experiences.

Attachment Security and Balanced Affect Regulation

Securely attached individuals have learned that proximity seeking is a viable way of attaining the attention of their attachment figures and that these figures will be responsive and supportive to their needs when they are distressed or threatened (Mikulincer et al., 2003; Mikulincer & Shaver, 2016). As a result, securely attached individuals utilize *security-based* strategies. Security-based strategies involve a realistic appraisal of threatening stimuli, the acceptance and open expression of emotions, including negative emotions, and the confident seeking of emotional and instrumental support from others. Moreover, due to their positive interactions with attachment figures, especially in situations where these figures have helped them manage or *coregulate* distress, securely attached individuals develop feelings of self-efficacy and control as they come to perceive threats as challenges that they can overcome (Mikulincer et al., 2003; Mikulincer & Shaver, 2016). Altogether, the security-based strategies of secure individuals result in a more positive, optimistic assessment of potential threats and concomitant negative emotional reactions as manageable, and many studies have confirmed that feelings of attachment security assist individuals in responding appropriately to a variety of threatening events (both attachment-and-nonattachment-related; e.g., Cassidy et al., 2009; Mikulincer & Florian, 1998; Mikulincer et al., 2000).

Several aspects of the preceding summary of attachment theory and research should be highlighted. First, attachment insecurity, that is, high levels of attachment anxiety or avoidance appears to be associated with negative views and expectations about others in general. Second, attachment anxiety and avoidance predict divergent emotional responses to both threatening, and at times positive and neutral situations and stimuli (including events and stimuli that are social in nature), with attachment anxiety predicting exaggeration and avoidance predicting inhibition of the attachment system and corresponding emotional reactions. As is argued in further detail below, this may have important implications for how individuals respond to direct as well as observed experiences of ostracism and its antithesis inclusion. That is, both being the target of and witnessing ostracism or inclusion may differentially activate the attachment system of highly anxious and avoidant persons. The end result may be that such persons may react differently to these social experiences, in terms of their emotional responses, and resultant perceptions of human nature and antisocial inclinations.

Theory and Research on Ostracism

Relationships with others and membership in groups provide a variety of benefits. These include companionship, physical and psychological support, sources of identity, as well as access to potential mates, and material resources. Many of these benefits would have been essential to survival and reproductive success in our ancestral past. As a result, humans are believed to have evolved a strong, innate need to affiliate with one another as well as a sensitivity to detecting threats to their connections with others (Baumeister & Leary, 1995; Williams, 2007). Detecting relational threats requires an appropriate signal. It has been posited (e.g., Williams, 2007) that the distress and pain associated with the loss of social relationships, such as by outright rejection or more subtly by ostracism (i.e., being ignored and excluded) serves as such a signal that

quickly orients an individual toward determining if ostracism is taking place, and how he or she might most effectively respond. Numerous studies indicate that experiencing ostracism is associated with activation in pain-processing brain regions, as well as increases in self-reported negative affect (e.g., sadness and anger), and hurt feelings (for a review of the rejection and ostracism literatures, see Richman & Leary, 2009; Williams, 2007, 2009).

Ostracism and Fundamental Need Satisfaction

In addition to eliciting pain and negative emotions, suffering ostracism has also been connected theoretically and empirically with a decrease in the satisfaction of what are considered four fundamental needs: belonging, self-esteem, control, and meaningful existence (Williams, 2001, 2009; cf. Richman & Leary, 2009). According to Williams (2001, 2009), each of these constructs can be considered basic needs because each offers a variety of benefits for psychological and physical well-being and severe pathological consequences can result if they are absent or thwarted. First, by separating and isolating the individual from others, ostracism directly threatens an individual's sense of belonging. Second, an individual's self-esteem is jeopardized by ostracism because it is often initiated without warning or without any accompanying reason. This lack of explanation may lead the ostracized individual to ruminate on why the ostracism occurred, which may result in a variety of negative self-attributions, for example, that they have committed some sort of indiscretion or that some characteristic of themselves is considered unpleasant and undesirable. Making and contemplating these negative self-attributions would likely lower the ostracized individual's self-esteem. Third, feelings of control are reduced by ostracism because, by its nature, it does not allow an individual to interact or engage with the perpetrator. That is, the ostracized target's behavior does not influence or elicit any action on the part of the perpetrator; the perpetrator simply does not respond. Last, as

ostracism involves being ignored it may lead an individual to feel as if they were dead or did not exist, which might highlight for them the fragility of their existence and lead them to question its meaning and worth (Williams, 2001, 2009).

Potential Moderation of Reflexive Reactions to Ostracism

In general, feelings of pain, heightened negative affect (including hurt feelings), and threatened fundamental needs together appear to constitute the immediate, reflexive reactions to ostracism. Theory and research on ostracism have largely considered these reactions to be less susceptible to modulation; the idea being that they are essential and adaptive, evolutionarily, because they ensure that an individual is actually attentive to indications of ostracism and thus in a position to potentially prevent any negative consequences that may result (e.g., loss of social support, and so forth). Indeed, early research on ostracism (reviewed by Williams, 2007, 2009) determined that a variety of individual difference variables and contextual factors did not influence the extent to which individuals experienced increases in negative affect, distress, and pain as a result of being ostracized. However, more recent research, including a 2015 meta-analysis of 120 Cyberball studies (Hartgerink, van Beest, Wicherts, & Williams, 2015) has demonstrated that immediate reactions to ostracism can in fact be moderated. For example, reflexive reactions to ostracism are attenuated in those who are chronically lonely or who have Cluster A personality disorders, as well as by feelings of power (relative to the ostracizers), receiving monetary compensation for being excluded, and prevailing social norms that minimize the threat posed by ostracism (Lelieveld, Moor, Crone, Karremans, & van Beest, 2012; Rudert & Greifeneder, 2016; Schoel, Eck, & Greifeneder, 2013; Wirth, Lynam, & Williams, 2010; Wesselmann, Wirth, Mroczek, & Williams, 2012).

Dispositional Attachment and Responses to Ostracism

Importantly for the present study, dispositional attachment has also been examined as a potential moderator of individuals' responses to experiencing ostracism. As argued by Yaakobi and Williams (2016a, 2016b), and is evident from the literature on ostracism (e.g., Williams, 2009), such experiences are threatening and painful. Moreover, ostracism is intrinsically related to (loss of) connections to, and acceptance by, others (Yaakobi & Williams, 2016a, 2016b; Williams, 2009). Thus, ostracism should pose an attachment-relevant threat and consequently activate an individual's attachment system and associated working models and characteristic ways managing affect (e.g., hyperactivation vs. deactivation), with the ultimate result being that individuals with different attachment styles should respond differently to instances of ostracism.

There is empirical support for the proposition that differences in attachment style have the capacity to alter individuals' reactions to ostracism, although some of the findings have been mixed. Some studies have not found any moderation by attachment (e.g., McDonald & Donnellan, 2012). In contrast, most studies have uncovered effects of attachment, however, not always consistently for both dimensions (i.e., anxiety and avoidance). In addition, at least one study reported that the moderating effect of attachment on responses to ostracism was itself moderated by other factors (e.g., culture-level characteristics; Yaakobi & Williams, 2016b). For example, Shaver and Mikulincer (2013) found that high levels of attachment anxiety (relative to low levels) exacerbated ostracism-induced declines in individuals' sense of having a meaningful existence; they did not find effects of avoidant attachment. Yaakobi and Williams (2016a) demonstrated that more avoidantly attached individuals from both individualist and collectivist cultures, as opposed to less avoidantly attached (i.e., more secure) persons, were less negatively affected by ostracism (as assessed by threatened fundamental need satisfaction and mood) and in fact were more distressed by inclusion. Yaakobi and Williams (2016a) did not find interactions

between anxious attachment and ostracism. However, in a similar study, Yaakobi and Williams (2016b) reported that avoidant attachment attenuated, whereas anxious attachment compounded declines in need satisfaction following ostracism, at least in individualistic (but not collectivistic) participants. Finally, DeWall et al. (2012) showed that following ostracism, anxious attachment predicted heightened activity in brain regions previously associated with negative affective and painful responses to ostracism, while avoidant attachment predicted decreased or dampened activity in these same regions.

Overall, despite inconsistencies, the weight of the evidence suggests that attachment style can moderate responses to direct experiences of ostracism, with higher anxious attachment predicting more negative reactions and higher avoidant attachment predicting less negative reactions. This contention is supported by attachment theory and associated research reviewed above documenting the divergent affect regulation strategies (i.e., hyperactivation vs. deactivation) and responses to threats (including socially-oriented threats) of anxiously and avoidantly attached individuals.

Attachment Style, Observing Ostracism, and the Primary Objective of the Present Study

Instances of ostracism are likely ubiquitous. Indeed, recent surveys in the United States reported that 66% of the full-time employees sampled had experienced the silent treatment from coworkers or supervisors over the past five years, and that 48.1% of adolescents had been the victim of relational bullying (including acts of social exclusion) at school at least once (Fox & Stallworth, 2005; Wang et al., 2009). Moreover, experiences with ostracism are not limited to relations with peers or colleagues, but infuse even our most valued relationships; 75% of a representative sample of Americans reported having suffered the silent treatment at the hands of a loved one (Faulkner, Williams, Sherman, & Williams, 1997, as cited in Williams, 2001). Given

its prevalence, there is a high likelihood that many individuals frequently witness acts of ostracism. In fact, 63% of public school students from the North of England aged 12 to 16 reported witnessing peer bullying (including acts of ostracism), and in naturalistic observations in Canadian classrooms and schoolyards, peers were found to be involved (including passively observing) in 85% of bullying interactions (Atlas & Pepler, 1998; Craig & Pepler, 1997; Rivers, Poteat, Noret, & Ashurst, 2009).

Although research on the effects of witnessing ostracism is still surfacing (a recent review of the literature on vicarious ostracism found only nine experimental studies; Wesselmann et al., 2013), several intra-and-interpersonal consequences have already been uncovered. In terms of intrapersonal outcomes, extant research suggests that individuals are negatively impacted by merely witnessing the ostracism of others. More specifically, observers of ostracism of various ages (ranging from children to adults) report declines in fundamental needs (e.g., belonging and self-esteem), reductions in mood, and increased feelings of humiliation, anger, and powerlessness (Coyne, Nelson, Robinson, & Gundersen, 2011; Graupmann, Pfundmair, Matsoukas, & Erber, 2016; Paolini, Pagliaro, Alparone, Marotta, & van Beest, 2017; Veldhuis et al., 2014; Wesselmann et al., 2009; Will et al., 2013). Observers of ostracism are also at a higher risk of developing various mental health problems (River et al., 2009). Moreover, neuroimaging studies indicate that witnessing ostracism is related to increased activity in brain regions connected with the processing of social pain and direct experiences of ostracism, as well as regions associated with mentalizing (i.e., thinking about other individuals' mental states; Masten, Eisenberger, Pfeifer, & Dapretto, 2010; Masten, Morelli, & Eisenberger, 2011; van der Meulen, van Ijzendoorn, & Crone, 2016). Overall, when individuals observe the

ostracism of others they react negatively, either because they also feel ostracized or threatened themselves or because they recognize and empathize with the distress of the target.

Vicarious ostracism has also been linked to a variety of interpersonal outcomes. For instance, observing ostracism increases affiliative behavior in children (e.g., selecting a seat closer to an experimenter; Marinovic, Wahl, & Trauble, 2017). Observing ostracism also often motivates prosocial behavior by observers toward the targeted individual, perhaps with the intention of alleviating their distress. Thus, in economic-games observers sacrifice some of their own resources to compensate the target, actively seek to reinclude ostracized individuals when they have been left out of a computerized game of ball-toss (i.e., Cyberball), and write excluded others encouraging emails (Masten et al., 2010; Paolini et al., 2017; van der Meulen et al., 2016; Will et al., 2013). In addition to assisting ostracized individuals, observers also tend to punish the perpetrators (e.g., by allocating them less money; Paolini et al., 2017; Will et al., 2013). Increased activity in mentalizing-linked brain regions, decreased fundamental need satisfaction, as well as the development of more negative impressions of the perpetrators after witnessing ostracism may underlie observers' compensation and punishment behavior (e.g., Masten et al., 2011; Paolini et al., 2017).

As research on observations of ostracism is in its early stages, only a limited number of potential moderators of the effects of observing such interactions have been investigated. In particular, the impact of vicarious ostracism on both intrapersonal (e.g., reduced need satisfaction) and interpersonal (e.g., compensation of target) outcomes appears to be increased when observers are higher in dispositional empathy, as well as when they take the perspective of the target, or have a closer relationship with him or her (Beeney, Franklin, Levy, Adams, 2011; Masten et al., 2010, 2011; Meyer et al., 2013; Wesselmann et al., 2009; Will et al., 2013;

Veldhuis et al., 2014). However, the possibility that dispositional attachment may influence not only how targets, but also observers respond to witnessing ostracism has not yet been evaluated empirically. Furthermore, despite exploring a variety of important affective and behavioral outcomes, research on the effects of observing ostracism has not examined how, or if, it might affect individuals' general perceptions and beliefs about human nature. Rather, prior work has only assessed how witnessing ostracism might affect impressions of the individuals directly involved in the encounter (i.e., the target and the perpetrators; Paolini et al., 2017). And, no research has directly and experimentally evaluated whether observing ostracism might heighten observers' antisocial inclinations and aggressive tendencies (Rivers et al., 2009). As a result, the primary objective of the current study was to extend prior work by determining if viewing ostracism might affect the favorability of observers' beliefs about human nature and antisocial inclinations and if these effects might be moderated by the observers' dispositional attachment.

Why might reactions to observing ostracism be moderated by attachment style? The likelihood that attachment style modulates individuals' responses to viewing ostracism might rest with its capacity to activate the attachment system. As argued by attachment theorists and is clear from research on attachment, threatening, stressful events, including threats originating from social sources (e.g., relationship conflicts) tend to activate individuals' attachment systems. And this is the case with direct experiences with ostracism. However, observing ostracism also appears to be a threatening event (e.g., Wesselmann et al., 2009). Due to its aversive and threatening nature, it is possible that witnessing ostracism might activate observers' attachment systems in a fashion similar to that which has been demonstrated with direct experiences of ostracism.

The potential for observations of ostracism to activate the attachment system has important implications for how observers might respond. Triggering an individual's attachment system should also activate the most dominant working models and affect regulation strategies that were learned and acquired through experiences with various attachment figures, and which underlie the operation of the attachment system. This has been demonstrated in research showing the divergent responses (i.e., amplification vs. inhibition of distress) of anxiously and avoidantly attached individuals to threatening events and stimuli. As a result, for individuals with insecure attachment styles (i.e., anxious or avoidant) observing ostracism has the potential to activate negative working models of self and others and associated beliefs others about as less trustworthy, helpful, well-intentioned, or altruistic because these are the models and beliefs that are associated with their attachment systems. Therefore, after viewing ostracism, anxious and avoidantly attached individuals should be liable to reporting more negative (i.e., less favorable) views of human nature.

As already discussed, attachment anxiety is associated with chronic hyperactivation of the attachment system. That is, in response to both threatening and neutral situations, anxiously attached individuals exaggerate and escalate the level of threat, as well as their negative emotional reactions. This hyperactivation has been documented in response to socially-oriented threats, such as relationship conflicts, imagined rejection, and direct experiences of ostracism. As a result, it is proposed that even just observing the ostracism of another individual will elicit a hyperactivated distress response from anxiously attached individuals, which will instantiate their negative beliefs and expectations about others, which will in turn lead them to subsequently describe human nature less favorably. In addition, based on the hyperactivation of people high in attachment anxiety, even under more neutral situations (see Mikulincer et al., 2002), as well as

their deep desire to develop connections with and closeness to others, it is possible that observing inclusion, because it is not they themselves who are being included, is also distressing for the anxiously attached individuals. Observing inclusion may be distressing for anxiously attached persons perhaps because it leads them to ruminate on a perceived lack of acceptance or closeness in their own relationships. Therefore, I hypothesized that, after viewing ostracism and inclusion, relative to a neutral control condition, attachment anxiety would be negatively associated with the favorability of observers' beliefs about human nature (Hypothesis 1a). I further predicted that these less favorable beliefs would be linked to more antisocial behavioral inclinations and aggressive tendencies (1b).

In contrast, attachment avoidance is associated with deactivation of the attachment system. This means that in reaction to threatening events and stimuli avoidant individuals inhibit the activation of their attachment system and any potential emotional responses by disengaging their attention from these stimuli. Like the hyperactivation of anxiously attached individuals, this deactivation has been evidenced in response to socially-oriented stimuli, for instance, relationship breakups, as well as instances of ostracism. As a result, it is proposed that observing ostracism, perhaps because it may activate or threaten to activate thoughts and feelings associated with the rejection (i.e., lack of acceptance) they have experienced at the hands of their attachment figures, will lead to deactivating responses from avoidant individuals, which will inhibit the activation of their negative beliefs and expectations about others, and so lead them to subsequently report more favorable views of human nature. Moreover, although some research indicates that more avoidant individuals disengage from and display deactivation in response to positive stimuli (e.g., positive attachment-related words; Edelstein, 2008), which may include direct experiences of inclusion (Yaakobi & Williams, 2016a), this might not be the case with

observed instances of inclusion occurring between others. Specifically, being directly included may be threatening for avoidantly attached individuals because, in addition to potentially activating negative thoughts and feelings related to the behavior of their attachment figures, it likely thwarts their desire for interpersonal distance and self-reliance. However, being an observer helps individuals high in attachment avoidance maintain this distance. As a result, observing inclusion may not be that impactful. Therefore, I hypothesized that, compared to a neutral control condition, after witnessing ostracism (but not inclusion) attachment avoidance would be positively associated with the favorability of observers' beliefs about human nature (Hypothesis 2a). I further predicted that these more favorable beliefs about human nature would correspond to less antisocial behavioral inclinations and aggressive tendencies (2b).

Observing ostracism was expected to influence views of human nature and antisocial behavioral inclinations and aggressive tendencies by temporarily increasing or decreasing the accessibility of anxiously and avoidantly attached individuals' negative beliefs and expectations about others. Moreover, for individuals high in attachment anxiety, their potential experience of witnessing ostracism (and inclusion) as aversive might make their perceptions of others even more negative, at least temporarily. Thus, their current views of human nature and antisocial behavioral inclinations were anticipated to be especially negative after vicarious ostracism (and inclusion) compared to the neutral control condition because their negative beliefs and expectations have both been activated and made more pessimistic.

In contrast, for avoidantly attached individuals, their negative beliefs and expectations were anticipated to be suppressed after observing ostracism, and so unable to influence their current perceptions of others and antisocial behavioral inclinations. Therefore, their views of human nature and antisocial inclinations were expected to be especially positive after vicarious

ostracism relative to the neutral control condition because in the neutral condition this inhibition was expected to be absent. In both cases, however, the changes in the views of human nature and antisocial behavioral inclinations of anxiously and avoidantly attached individuals may not necessarily endure over time, but may only be a temporary shift in response to the outcome of a salient social interaction that they have witnessed. Yet, repeated observation of acts of ostracism (and perhaps inclusion) and the corresponding activation or inhibition of negative beliefs and antisocial inclinations might create a self-fulfilling prophecy that might ultimately change anxiously and avoidantly attached individuals' views' of human nature and antisocial inclinations over time.

Ancillary Objectives of the Present Study

Beyond the primary objective of evaluating the potential interaction between attachment and observation of ostracism (and inclusion) on individuals' views of human nature, there were also two ancillary objectives of the present study. The first related to the potential activation (or lack thereof) of the attachment system after witnessing ostracism and inclusion. Rather than just inferring activation or deactivation based on the divergent responses of anxious and avoidantly attached individuals, as has been done in past research on direct experiences of ostracism (e.g., Yaakobi & Williams, 2016b), activation and deactivation was more directly assessed by examining reactions times (RTs) to attachment-related positive and negative words in a lexical decision task (LDT). I hypothesized that compared to a neutral control condition, after observing ostracism and inclusion attachment anxiety would be negatively associated with RTs to positive and negative attachment-related words combined (i.e., faster RTs); indicating hyperactivation of the attachment system (Hypothesis 3a). Conversely, I predicted that relative to a neutral control condition, after viewing ostracism (but not inclusion) attachment avoidance would be positively

associated with RTs to positive and negative attachment-related words combined (i.e., slower RTs); indicating deactivation of the attachment system (Hypothesis 3b). Attachment anxiety or avoidance were not expected to be related to RTs to neutral words in any condition.

The second ancillary objective was directly concerned with extending prior research. More specifically, the present study sought to advance our understanding of how vicarious ostracism impacts observers' impressions of the individuals involved in such interactions by determining whether attachment might moderate the effect of witnessing ostracism on observers' impressions of the perpetrators. Based on past work documenting the hyperactivating responses of anxiously attached persons to threatening and more benign situations, witnessing ostracism and inclusion was anticipated to activate their negative beliefs, expectations, and so forth about others, and subsequently lead them to report more negative impressions of the implicated individuals. Thus, I predicted that after observing ostracism and inclusion, relative to a neutral control condition, attachment anxiety would be negatively associated with observers' impressions of the perpetrators (Hypothesis 4a). Conversely, as a result of the deactivation displayed by avoidantly attached persons under threatening conditions, observing ostracism (but not inclusion) was expected to lead to a defensive reaction characterized by the suppression of their emotions and the inhibition of their pessimistic beliefs and expectations about others. As a result, I hypothesized that after witnessing ostracism (but not inclusion), compared to a neutral

control condition, attachment avoidance would be positively associated with observers' impressions of the perpetrators (Hypothesis 4b).¹

Method

Participants

Six hundred and twenty-seven participants (61.2% women, M age = 20.00 years, SD = 4.22) enrolled in introductory psychology at the University of Manitoba completed the study in return for partial course credit. This sample size does not include individuals who incorrectly answered the manipulation check ($n = 355$; see description of manipulation check below) or reported they were unable to view the manipulation ($n = 135$), completed the study more than once ($n = 56$), and indicated a sex other than male or female ($n = 2$). Initial estimates suggested that a sample size of 522 would provide power of .95 to detect the effect of any predictor in a multiple regression analysis (interactions are treated as predictors) with $\alpha = .05$, two-tailed. The effect size used in the calculation of this sample size was the average interaction effect size (i.e., the interaction between attachment and experimental condition; ostracism vs. inclusion) obtained by Yaakobi and Williams (2016a, 2016b) in their studies of the impact of attachment on responses to direct experiences of ostracism ($f^2 = 0.0492$). However, there was uncertainty about

¹ Consistent with predictions regarding the perpetrators, it could be hypothesized that attachment anxiety would be negatively associated with impressions of the target after witnessing ostracism and inclusion and that attachment avoidance would be positively associated with impressions of the target after observing ostracism, but not inclusion (both relative to a neutral control condition). However, past work documented no effects of vicarious ostracism on observers' global impressions of the target (Paolini et al., 2017). Yet other research has found that vicarious ostracism can elicit empathy and compensatory behavior toward targets (e.g., Masten et al., 2010), which may be associated with or reflect a more positive impression of him or her. As a result of these conflictual findings, no specific predictions were made concerning observers' impressions of the target. Exploratory analyses were performed to assess the potential interactive effect of observing ostracism (and inclusion) and attachment on observers' judgements of targets.

what effect size might reasonably be expected for interactions between attachment and observed experiences of ostracism. As a result, this study sought to over-recruit participants and data collection continued until time constraints made recruitment no longer feasible.

Materials

Dispositional attachment measure. Dispositional attachment was evaluated with a short-form of the Experiences in Close Relationships Scale (ECR-12; Lafontaine et al., 2016). This 12-item scale measures the two dimensions of avoidance and anxiety thought to underlie attachment. Six items measure avoidance (the odd-numbered items; e.g., “I feel comfortable depending on romantic partners”; reversed scored; $\alpha = .85$) and six items measure anxiety (the even-numbered items; e.g., “I worry about being abandoned”; $\alpha = .86$). Ratings were made on a 9-point scale, (1 = *disagree strongly*, 9 = *agree strongly*). Items one, three, five, and seven were reversed scored. Scores for each attachment dimension were calculated by averaging their corresponding items, with higher scores indicating greater avoidance or anxiety. Participants were asked to respond to each item while thinking about how they generally feel in close relationships (e.g., with family members, romantic partners, or close friends). As a result, attachment was assessed at the general level. The ECR-12 was administered at the beginning of the study alongside other items assessing demographic and background information (e.g., sex, age). The full ECR-12 is presented in Appendix A. To distract participants from the content of the ECR, they completed the 18-item Need for Cognition Scale (NCS; Cacioppo, Petty, & Kao, 1984) as a filler task before encountering the ostracism and inclusion manipulation and completing the dependent measures. The NCS is presented in Appendix B.

Ostracism and inclusion manipulation. Cyberball (Williams, Yeager, Cheung, & Choi, 2012) was used to manipulate whether participants witnessed another unrelated individual

experience ostracism or inclusion. Cyberball is a computer program in which individuals either take part in or observe a virtual game of ball-toss. In the present study all participants were assigned to the role of observers. They viewed a game of Cyberball that they were led to believe was occurring in real-time over the internet between three other participants. In the game, the players, represented by cartoon avatars and photographs (order counter-balanced and matched to participants' gender) appeared to toss a ball amongst themselves. In reality, there were no other participants, and the behavior of the players, as well as the outcome of the game was entirely computer-controlled and predetermined. All games of Cyberball consisted of 30 throws. In the observed ostracism condition participants witnessed one player initially received the ball twice from the other players and then never again for the remainder of the game (i.e., only 6.67% of the total tosses). In the observed inclusion condition participants viewed all players receive the ball an equal 10 times (i.e., all players received an equal 33.33% of the total tosses). There was also a neutral control condition in which participants did not complete a game of Cyberball.

Attachment system activation. To assess activation (or lack thereof, i.e., deactivation) of the attachment system in response to witnessing ostracism (or inclusion) participants completed a computerized lexical decision task (modeled after that employed by Mikulincer et al., 2000; 2002). In this task, participants were asked to read a string of letters and decide as quickly as they could if that string was a real English word or a nonword. The lexical decision task contained 60 experimental trials. On each experimental trial one of 60 letter strings was presented for 1000 ms and participants indicated their response by clicking one of two keys on the keyboard. Following their response, the letter string disappeared and after a brief 2 s pause the next string appeared. The stimuli formed by the letter strings were drawn from one of four categories (adapted from Edelstein & Gillath, 2008): 10 were positive attachment-related words

(e.g., adore, caring, trust, loving), 10 were negative attachment-related words (e.g., abandon, reject, loss, insecure), 10 were neutral words (e.g., quantity, combine, notice, middle), and 30 were nonwords. RTs to positive and negative attachment-related words on correct decision trials only (averaged together; $r = .82$) were used to assess activation or deactivation of the attachment system. The lexical decision task also contained 12 practice trials. The words and nonwords presented in the practice trials were different from those used in the experimental trials. A full list of the attachment-related and neutral words is contained in Appendix C.

Beliefs about human nature. To assess their beliefs about human nature participants completed the Revised Philosophies of Human Nature Scale (R-PHN; Wrightsman, 1974; Wrightsman, 1992). The R-PHN contains two subscales, each assessed with 10 items. The Cynicism subscale measures the degree to which individuals typically expect and believe others to be untrustworthy and dishonest (e.g., “Most people would tell a lie if they could gain by it”). The Beliefs That People are Conventionally Good subscale measures the extent to which individuals believe others are kind, moral, and helpful (e.g., “The typical person is sincerely concerned about the problems of others”). Participants were asked to respond to each item based on how they were currently feeling. Ratings were made on a 6-point scale, (1 = *disagree strongly*, 6 = *agree strongly*). The items on the Cynicism subscale were reversed scored and averaged with items from the Beliefs That People are Conventionally Good subscale, such that higher scores indicated more favorable, positive beliefs about human nature. Cronbach’s alpha for the combined scales was .77, for the Cynicism subscale it was .77, and for the Beliefs that People are Conventionally Good subscale it was .79. The R-PHN is presented in Appendix D.

Antisocial inclinations and aggressive tendencies. Participants’ antisocial inclinations and aggressive tendencies were operationalized and assessed as (a) the increased accessibility of

aggressive thoughts (e.g., Carnagey & Anderson, 2005) and (b) the endorsement of pro-aggression norms (Krahé & Möller, 2004).

Aggressive cognitions. To measure the accessibility of aggressive cognitions participants completed a word-fragment task (modeled after that employed by Carnagey & Anderson, 2005) in which they were asked to complete as many word fragments as they could (out of a total of 96) in a five-minute period. Approximately half (50) of the word fragments were able to be completed to form an aggression-related word. For instance, “CHO_E” could be completed as “chore”, “chose”, or “choke”. Word completions were coded as aggressive words, ambiguously aggressive words, and neutral words according to a coding scheme developed by Carnagey & Anderson (2005). Aggressive words counted as one aggression-related completion and ambiguously aggressive words counted as one-half an aggression-related completion (Sestir & Bartholow, 2010). To form an index of aggressive cognitions the number of aggressive word completions was divided by the total number of word fragments completed (excluding nonword completions). Higher scores thus indicate greater accessibility of aggressive thoughts. Examples of some of the word fragments and their possible solutions are presented in Appendix E.

Pro-aggression norms. The endorsement of aggressive norms scale (EAN; Krahé & Möller, 2004) was used to measure the extent to which participants currently perceive aggression as normative. This scale contains 15 items, eight of which assess relational aggression (e.g., spreading rumors) and seven of which assess physical aggression (e.g., hitting). Ratings were made on a 4-point scale, (1 = *not at all ok*, 4 = *totally ok*). To form an overall index of participants’ endorsement of aggressive norms, participants ratings were averaged across items referring to relational and physical aggression, such that higher scores indicate greater endorsement of aggressive norms. Cronbach’s alpha for the total subscale was .91, for the

relational aggression items it was .85, and for the physical aggression items it was .86. The EAN is presented in Appendix F.

Impressions of the players in Cyberball. To assess their impressions of the perpetrators and targets, participants rated the degree to which they thought that 12 trait adjectives described each of the players from the game of Cyberball that they observed. Participants in the neutral control condition were asked to indicate their expectations regarding the ostensible players in the upcoming interaction by indicating the extent to which they thought the trait adjectives might describe each individual. Half of the traits were positive and half were negative. The traits were similar to the attributes participants used to evaluate human nature (e.g., trustworthy, immoral, and so on). Ratings were made on a 7-point scale (1 = *not at all descriptive*, 7 = *extremely descriptive*). The order in which participants made their ratings of the players was randomized. Ratings of the negative trait adjectives were reversed scored and averaged with the ratings of the positive trait adjectives to create an overall index of observers' impressions of the players, with higher scores indicating more positive impressions. One index was formed for the two perpetrators ($r = .59$, $\alpha = .87$) and for exploratory purposes one for the target ($\alpha = .77$). The full list of trait adjectives is presented in Appendix G.

Manipulation check. To ensure that all participants ultimately included in analyses were actually able to view the interaction they were assigned to observe and were aware of its outcome, participants were asked to complete a manipulation check question at the end of the study. They were given four options and were asked to select the one that best described what occurred during the game of ball-toss. The four options were: (a) one person received next to no tosses during the game (corresponding to the observed ostracism condition), (b) all three people received the ball about equally during the game (corresponding to the observed inclusion

condition), (c) I was told I would view the game of ball-toss later in the survey (corresponding to the neutral control condition), and (d) I was unable to view the game of ball-toss (corresponding to potential technical malfunction).

Procedure

This study took place over the internet in the form of an online survey. Participants connected to the study website for a study ostensibly examining “social perception processes”. They were instructed that during the study they would complete a variety of different tasks, including several questionnaires evaluating their thoughts and feelings, as well as a word completion and word identification task. In addition, they were informed that one of the study tasks they may be asked to complete would involve engaging in an online interaction with three other people who were also currently participating in the study. Participants were further notified that the interaction would involve completing an online game of ball-toss in which participants are randomly assigned to be either players or observers. The game of ball-toss was Cyberball. This cover story allowed for the surreptitious manipulation of the observation of ostracism or inclusion. After completing the ECR-12 and filler NCS, ostensibly for background information, all participants were informed of their role as observers for the upcoming game and were then randomly assigned to either the observed inclusion, observed ostracism, or neutral control condition. In the former two conditions, they viewed the appropriate game of Cyberball and then completed the main dependent measures in the order in which they were described above. In the neutral control condition, participants completed the main dependent measures expecting a forthcoming game of Cyberball. At the end of the study, all participants were debriefed and thanked for their time. The entire study took an estimated 25 minutes to complete. A schematic overview of the procedure of the study is presented in Figure 1.

Results

Descriptive statistics for the main dependent variables are reported in Table 1 and bivariate correlations are presented in Table 2.²

Preliminary Analyses and Tests of Assumptions

Preliminary analyses were performed to determine whether the statistical assumptions of linear regression were met. All assumptions (e.g., homoscedastic and normally distributed residuals) were met for all variables except for aggressive cognitions (heteroscedastic), endorsement of pro-aggression norms (slightly non-normal and heteroscedastic), and impressions of the perpetrators and target (heteroscedastic). Regression is considered quite robust to violations of normality (Hayes & Darlington, 2016). Therefore, corrections were only made to account for heteroscedasticity of residuals. This was done by performing analyses using a heteroscedasticity-consistent standard error (e.g., Hayes & Cai, 2007, Hayes & Darlington, 2016) that can accommodate heteroscedasticity in residuals, and which removes the possible biasing effect of heteroscedasticity on the inferences drawn from the significance tests of model statistics (e.g., regression coefficients, *F*-ratios, etc.).

Primary Analyses

² Although cell sizes for the observed experience conditions were unequal, which results in predictors being nonorthogonal and to account for overlapping portions of variance in outcomes, the analysis employed in this study (see below) accounts for this unbalance. It does so by adjusting each main effect for each other main effect (as well as covariates) and adjusting interactions for all other effects. It should be noted that in the presence of a significant interaction this analysis may result in biased tests of main effects, whereas without a significant interaction this approach apportions more variance to each main effect and provides a more powerful test of them. However, given that the interactions between observed experience and attachment were the primary focus of this study and interpretation of main effects are generally not meaningful when an interaction is present, the employed analysis seems the most appropriate test of my hypotheses despite the unequal cell sizes (Howell, 2013; Tabachnick & Fidell, 2013; Zahn, 2010).

Main analyses for each dependent variable were performed using hierarchical multiple regression. The first step contained the observed experience conditions, represented by two dummy-coded variables contrasting the observed inclusion and observed ostracism conditions with the neutral control condition (e.g., observed ostracism = 1, all other conditions = 0), the attachment anxiety and attachment avoidance dimensions as continuous predictors and participants' sex as a covariate. The second step added the two-way interaction between the attachment dimensions and observed experience (as represented by the dummy contrasts) and the interaction between sex and observed experience,³ while the third step added the three-way interactions between both attachment dimensions and observed experience.⁴ As there were no significant three-way interactions, these terms were not included in the analyses reported below. Moreover, the two-way interaction between the attachment dimensions was also not included in the final analyses because this effect does not involve an interaction with the experimental manipulation. Results were not meaningfully affected by excluding these interactions.

³ The gender of participants was controlled in all analyses because some prior work (Blackhart, Nelson, Knowles, & Baumeister, 2009; Williams & Sommer, 1997) indicates that women may respond differently, perhaps more negatively, to direct experiences of ostracism.

⁴ Some research (Dewitte & De Houwer, 2008; Dewitte, Koster, De Houwer, & Buysse, 2007) indicates that the interaction between attachment anxiety and avoidance is the best predictor of attentional disengagement from threatening attachment-related stimuli. To the extent that such disengagement is related to the suppression of emotional reactions and the inhibition of working models it would seem essential to evaluate the interactive effect of the two attachment dimensions on observers' responses to vicarious ostracism (and inclusion). However, a larger proportion of studies has not found this interaction. Thus, the interactive effect of attachment anxiety and avoidance on each of the dependent variables was only evaluated in an exploratory fashion with a particular emphasis on the three-way interaction between the attachment dimensions and observed experience (i.e., potentially threatening stimuli).

The significance of the two-way interactions between the attachment dimensions and observed experience was assessed by evaluating the change in the multiple correlation squared (ΔR^2) of the model when those interactions were added as predictors (Hayes, 2017). These interactions were determined to be significant if the p -value of the F -ratio testing the ΔR^2 reached conventional levels of statistical significance. These analyses were performed using the PROCESS macro v3.0 (Hayes, 2017). Below I report the F -ratio, its p -value, and ΔR^2 for the test of each two-way interaction.

The nature of significant interactions was examined through simple slope analyses (Aiken & West, 1991) and were conducted using PROCESS. Analyses controlling for heteroscedasticity of residuals were performed using PROCESS and the RALM macro v1.10 (Hayes and Darlington, 2016) which allow for the implementation of heteroscedastic-consistent standard errors.

Results are presented in Table 3 through Table 17 and described in more detail below for each dependent variable. The attachment dimensions were mean-centered in all analyses. Cohen's d is reported for all effects and was calculated based on the t -value and degrees of freedom for each corresponding regression coefficient. I report all effects other than those of the sex covariates (except where these covariates interacted with the experimental manipulation).

Beliefs About Human Nature

For participants' total beliefs about human nature the interactive effects defined by attachment anxiety \times observed experience and attachment avoidance \times observed experience were both anticipated to be significant. Simple slope analyses were expected to reveal that after observing both inclusion and ostracism (relative to the control condition) attachment anxiety was significantly negatively related to participants' total beliefs about human nature, while

attachment avoidance was significantly positively related to participants' beliefs about human nature only after observing ostracism (compared to the neutral control condition).

Results of the hierarchical regression indicated a marginal main effect of attachment avoidance, $b = -0.02$, $\beta = -0.07$, $t(620) = -1.72$, $p = .086$, $d = 0.14$, but contrary to hypotheses, no significant interaction between avoidance and observed experience, $F(2, 614) = 0.42$, $p = .658$, $\Delta R^2 = .001$. Higher attachment avoidance predicted less positive views of human nature. There was also a significant main effect of attachment anxiety, $b = -0.05$, $\beta = -0.17$, $t(620) = -4.38$, $p < .001$, $d = 0.35$, and a marginally significant overall two-way interaction between attachment anxiety and observed experience, $F(2, 614) = 2.68$, $p = .070$, $\Delta R^2 = .01$. The attachment anxiety \times ostracism contrast was significant, $b = 0.06$, $\beta = 0.15$, $t(614) = 2.31$, $p = .021$, $d = 0.19$. There were no other significant effects (see Table 3).

Simple slope analyses revealed, inconsistent with hypotheses, that attachment anxiety was significantly negatively related to participant's overall beliefs about human nature both in the control condition, $b = -0.09$, $t(614) = -3.98$, $p < .001$, $d = 0.32$, and after they observed inclusion, $b = -0.05$, $t(614) = -2.39$, $p = .017$, $d = 0.19$, but not after they witnessed ostracism, $b = -0.02$, $t(614) = -1.41$, $p = .158$, $d = 0.11$ (see Figure 1). A complementary analysis indicated that for less anxiously attached participants (those one standard deviation below the mean on attachment anxiety), observing ostracism led to a marginally significant reduction in the positivity of their beliefs about human nature, $b = -0.17$, $t(614) = -1.83$, $p = .067$, $d = 0.15$, whereas there were no significant or marginal effects of observing ostracism or inclusion (relative to the control condition) for those average or relatively high in attachment anxiety (those one standard deviation above the mean; ts ranged from -1.25 to 0.60 , all $ps > .20$; see Figure 2).

As the two subscales of the R-PHN were only weakly correlated (see Table 2), the potential interactive effect of attachment and observed experience was examined in an exploratory fashion for the Cynicism and Beliefs that People are Conventionally Good subscales individually.

For participants' beliefs that people are good, there was a significant main effect of attachment avoidance, $b = -0.06$, $\beta = -0.16$, $t(620) = -3.95$, $p < .001$, $d = 0.32$. Greater avoidance predicted lower beliefs that people are generally good. There were no other significant or marginal effects (see Table 4).

For participants' cynical beliefs about others there was a significant main effect of attachment anxiety, $b = -0.09$, $\beta = -0.23$, $t(620) = -5.70$, $p < .001$, $d = 0.46$, and a marginally significant overall two-way interaction between attachment anxiety and observed experience, $F(2, 614) = 2.62$, $p = .074$, $\Delta R^2 = .01$. A significant attachment anxiety \times ostracism contrast did emerge, $b = 0.08$, $\beta = 0.14$, $t(614) = 2.16$, $p = .031$, $d = 0.17$.

Simple slope analyses revealed that attachment anxiety was significantly negatively related to participants' cynical beliefs in all experimental conditions; $b = -0.13$, $t(614) = -4.37$, $p < .001$, $d = 0.35$ in the control condition; $b = -0.10$, $t(614) = -3.83$, $p < .001$, $d = 0.31$ after they witnessed inclusion; $b = -0.05$, $t(614) = -2.18$, $p = .030$, $d = 0.18$ after witnessing ostracism (see Figure 3). However, a complementary simple slope analysis indicated no significant or marginal effects of observing ostracism or inclusion (relative to the control condition) across individuals who differed in their relative levels attachment anxiety (see Figure 3). There was no significant main effect of attachment avoidance or of observing ostracism or inclusion and no significant two-way interaction between attachment avoidance and observed experience, $F(2, 614) = 1.73$, $p = .178$, $\Delta R^2 = .01$ (see Table 5).

Pro-aggression Norms

Results for participants' endorsement of aggressive norms were anticipated to reveal significant two-way interactions between attachment anxiety and avoidance and observed experience, with simple slope analyses indicating that after observing inclusion and ostracism (compared to the control condition), attachment anxiety was significantly positively related to endorsement of aggressive norms and that attachment avoidance was significantly negatively related to endorsement of aggressive norms only after observing ostracism (relative to the neutral control condition).

Analyses yielded a significant main effect of witnessing inclusion, $b = 0.11$, $\beta = 0.13$, $t(169) = 3.02$, $p = .003$, $d = 0.24$ and a marginal main effect of witnessing ostracism, $b = 0.06$, $\beta = 0.07$, $t(619) = 1.88$, $p = .061$, $d = 0.15$. Observing either experience led participants to subsequently more strongly endorse aggressive norms. There was also a significant main effect of attachment anxiety, $b = 0.02$, $\beta = 0.09$, $t(619) = 2.35$, $p = .019$, $d = 0.19$ and a marginal main effect of attachment avoidance, $b = 0.02$, $\beta = 0.07$, $t(619) = 1.93$, $p = .054$, $d = 0.15$. Higher levels of attachment anxiety or avoidance predicted greater endorsement of aggressive norms. Contrary to hypotheses, there was no significant two-way interaction between attachment anxiety and observed experience, $F(2, 613) = 0.16$, $p = .850$, $\Delta R^2 = .0004$. However, analyses did indicate a marginally significant overall two-way interaction between attachment avoidance and observed experience, $F(2, 613) = 2.60$, $p = .08$, $\Delta R^2 = .01$ and a significant attachment avoidance \times ostracism contrast, $b = 0.04$, $\beta = 0.11$, $t(613) = 2.09$, $p = .037$, $d = 0.17$. The regression analysis for endorsement of aggressive norms is presented Table 6.

Simple slope analyses probing the attachment avoidance \times observed experience interaction indicated, somewhat unexpectedly, that after witnessing ostracism, attachment

avoidance was significantly positively related to participants' endorsement of pro-aggression norms, $b = 0.04$, $t(613) = 2.92$, $p = .004$, $d = 0.24$, whereas after witnessing inclusion, $b = 0.001$, $t(613) = 0.04$, $p = .967$, $d = 0.003$, or in the control condition, $b = 0.001$, $t(613) = 0.11$, $p = .914$, $d = 0.01$, it was not (see Figure 4). A complementary simple slope analysis revealed that witnessing both ostracism and inclusion, relative to the control condition, led individuals relatively high in attachment avoidance (one standard deviation above the mean) to more strongly endorse aggression as normative, $b = 0.16$, $t(613) = 2.41$, $p = .016$, $d = 0.19$ and $b = 0.16$, $t(613) = 2.15$, $p = .032$, $d = 0.17$ for the observed ostracism and observed inclusion contrasts respectively. Conversely, for those average or relatively low in attachment avoidance only observing inclusion (relative to the control condition) led them to more strongly endorse aggressive norms, $b = 0.16$, $t(613) = 2.34$, $p = .020$, $d = 0.19$ and $b = .16$, $t(613) = 2.04$, $p = .042$, $d = 0.16$ for the average and relatively low attachment avoidance inclusion contrasts respectively (see Figure 4). Thus, it is primarily after witnessing ostracism that differences in the endorsement of aggressive norms emerged between those who differ in their levels of attachment avoidance.

Aggressive Cognitions

Analyses on the proportion of word completions participants completed as aggression-related words were expected to reveal significant interactive effects between both attachment anxiety and avoidance and observed experience. Results indicated no significant main effects and, contrary to hypotheses, no significant two-way interactions between either of the attachment dimensions and observed experience, $F(2, 612) = 1.49$, $p = .226$, $\Delta R^2 = .005$ and $F(2, 612) = 0.40$, $p = .671$, $\Delta R^2 = .002$, for the attachment anxiety \times observed experience interaction and attachment avoidance \times observed experience interaction respectively. The regression analyses are presented in Table 7.

Attachment System Activation

For activation of participants' attachment systems as assessed through reaction times (RTs) in milliseconds to the (positive and negative) attachment-related words on the lexical decision task (LDT), the interactive effect defined by attachment anxiety \times observed experience and attachment avoidance \times observed experience were both expected to be significant for RTs to attachment-related words, but not for RTs to neutral words.

Results of the hierarchical regression on RTs to positive and negative attachment-related words combined indicated a main effect of attachment anxiety, $b = -5.02$, $\beta = -.12$, $t(605) = -2.94$, $p = .003$, $d = 0.24$. Greater feelings of attachment anxiety predicted faster RTs to attachment-related words. However, contrary to hypotheses, no significant two-way interactions emerged between either of the attachment dimensions and observed experience, $F(2, 599) = .12$, $p = .888$, $\Delta R^2 = .0004$ and $F(2, 599) = 0.03$, $p = .970$, $\Delta R^2 = .0001$, for the interaction between attachment anxiety and observed experience and between attachment avoidance and observed experience, respectively. There were no other significant effects (see Table 8).

For exploratory purposes, RTs to attachment-related negative and positive words were examined separately. Analyses yielded only a main effect of attachment anxiety, $b = -5.37$, $\beta = -.13$, $t(605) = -3.04$, $p = .002$, $d = 0.25$ and $b = -4.44$, $\beta = -.10$, $t(604) = -2.44$, $p = .015$, $d = 0.20$, for negative and positive attachment-related words respectively. All interaction effects were nonsignificant (F s ranged from 0.01 to 0.42; see Table 9 and Table 10).

There were no significant main or interaction effects on RTs to neutral words, $F(2, 598) = 0.50$, $p = .606$, $\Delta R^2 = .002$ and $F(2, 598) = 0.18$, $p = .833$, $\Delta R^2 = .001$ for attachment anxiety \times observed experience and attachment avoidance \times observed experience interactions respectively. See Table 11 for regression results.

Exploratory analyses were also conducted on how accurate participants were in correctly identifying the word presented on each trial of the LDT as a word or non-word. For each trial, a correct response was coded as one and an incorrect response was coded as zero. Participants' overall accuracy was computed by averaging their responses across all trials, separately for each word type (i.e., negative and positive attachment-related and neutral words) as well as for the attachment-related words combined. These analyses accounted for heteroscedasticity. Results indicated no significant main or interaction effects on participants' degree of accuracy on the LDT for all word types separately or combined (interaction effect F s ranged from 0.04 to 1.57, with p s ranging from .210 to .958). See Table 12 through Table 15 for regression results.

Impressions of Perpetrators and Target

For observers' impressions of the perpetrators, analyses were expected to yield significant two-way interactions between the attachment dimensions and observed experience. Results indicated significant main effects of both observing ostracism, $b = -1.16$, $\beta = -0.68$, $t(618) = -14.95$, $p < .001$, $d = 1.20$ and observing inclusion, $b = -0.58$, $\beta = -0.34$, $t(618) = -7.87$, $p < .001$, $d = 0.63$. Observers who witnessed either inclusion or ostracism reported less positive impressions of the perpetrators relative to observers' expectations of them in the control condition (i.e., when anticipating a game of Cyberball). There were also significant main effects of attachment anxiety, $b = -0.05$, $\beta = -0.11$, $t(618) = -3.33$, $p < .001$, $d = 0.27$ and attachment avoidance, $b = -0.04$, $\beta = -0.08$, $t(618) = -2.25$, $p = .025$, $d = 0.18$. Higher attachment anxiety or avoidance predicted less positive impressions of the perpetrators regardless of the observed experience. However, inconsistent with hypotheses, there were no significant two-way interactions between either of the attachment dimensions and observed experience, $F(2, 612) = 0.36$, $p = .698$, $\Delta R^2 = .001$ and $F(2, 612) = 0.25$, $p = .776$, $\Delta R^2 = .001$, for the attachment anxiety

× observed experience and attachment avoidance × observed experience interaction respectively.

The regression analyses for impressions of the perpetrators are presented in Table 16.

Further inspection of the regression analyses for impressions of the perpetrators indicated a significant sex × ostracism contrast, $b = -0.50$, $\beta = -0.26$, $t(612) = -3.20$, $p = .002$, $d = 0.26$.

Given that this effect suggests a potential interaction between participant sex and the manipulation, exploratory analyses were conducted to test for an overall two-way interaction between sex and observed experience. Results indeed revealed a significant sex × observed experience interaction, $F(2, 612) = 10.90$, $p < .001$, $\Delta R^2 = .02$. Simple slope analyses showed that after observing both inclusion and ostracism, compared to the control condition, male and female participants had less positive impressions of the perpetrators ($p < .001$ for all contrasts with control condition for each sex). A complementary analysis indicated that female participants' impressions of the perpetrators were more positive than male participants' after witnessing inclusion, $b = 0.46$, $t(612) = 6.19$, $p < .001$, $d = 0.50$ and in the control condition, $b = 0.48$, $t(612) = 3.61$, $p = .0003$, $d = 0.29$, whereas male and female participants did not differ in their impressions after observing ostracism, $b = -0.02$, $t(612) = -0.21$, $p = .838$, $d = 0.02$ (see Figure 5).

Exploratory analyses on observers' impressions of the target yielded a significant main effect of attachment avoidance, $b = -0.06$, $\beta = -0.11$, $t(617) = -2.53$, $p = .012$, $d = 0.20$. Greater attachment avoidance predicted less positive impression of the target irrespective of the observed experience. There were no significant main effects of attachment anxiety or observation of inclusion or ostracism and no significant two-way interactions between either of the attachment dimensions and observed experience, $F(2, 611) = 0.74$, $p = .475$, $\Delta R^2 = .002$ and $F(2, 611) = 1.41$, $p = .246$, $\Delta R^2 = .005$ for the attachment anxiety × observed experience and attachment

avoidance \times observed experience interactions respectively. The regression analyses are presented in Table 17.

Similar to results for impressions of the perpetrators, additional inspection of the regression analyses for impressions of the target revealed a significant sex \times ostracism contrast as well as a significant sex \times inclusion contrast, $b = 0.44$, $\beta = 0.22$, $t(611) = 2.29$, $p = .022$, $d = 0.19$ and $b = 0.51$, $\beta = 0.24$, $t(611) = 2.64$, $p = .008$, $d = 0.21$ respectively. An exploratory analysis confirmed the presence of a sex \times observed experience interaction, $F(2, 611) = 3.64$, $p = .027$, $\Delta R^2 = .01$. Simple slope analyses indicated that, relative to the control condition, female participants' impressions of the target did not differ after witnessing inclusion ($p = .496$) or ostracism ($p = .377$), whereas male participants had less positive impressions of the target after observing both inclusion, $b = -0.43$, $t(611) = -2.91$, $p = .004$, $d = 0.24$ and ostracism, $b = -0.34$, $t(611) = -2.28$, $p = .023$, $d = 0.18$. A complementary analysis showed that although male and female participants' impressions of the target did not differ in the control condition ($p = .240$), female participants' impressions were more positive than male participants' after observing inclusion and ostracism, $b = 0.71$, $t(611) = 6.95$, $p < .001$, $d = 0.56$ and $b = 0.64$, $t(611) = 6.41$, $p < .001$, $d = 0.52$ (see Figure 6).

Discussion

Primary Objectives

The primary purpose of the present study was to evaluate whether observing ostracism, and perhaps also inclusion, might reduce the favorability of observers' views of human nature and increase their antisocial behavioral inclinations. This study focused in particular on determining whether individual differences in observers' dispositional attachment might moderate these effects. I hypothesized that after viewing ostracism and inclusion, relative to a

neutral control condition, attachment anxiety would be negatively associated with the favorability of observers' beliefs about human nature (indicating less positive beliefs; Hypothesis 1a) and positively related to observers' antisocial behavioral inclinations (1b). Conversely, it was predicted that compared to a neutral control condition, after observing ostracism (but not inclusion) attachment avoidance would be positively associated with the favorability of observers' beliefs about human nature (suggesting more positive beliefs; Hypothesis 2a) and negatively related to observers' antisocial behavioral inclinations (2b).

Overall, these hypotheses were only partially supported. Specifically, observers' levels of attachment anxiety did moderate the effect of observed experience on their beliefs about human nature. However, it was actually those who were relatively low (as opposed to high) in attachment anxiety that appeared sensitive to the type of observed experience, reporting less favorable views of human nature after observing ostracism (although this decline was only marginally significant). In addition, there was a nonsignificant trend for observers low in attachment anxiety to report less favorable views of human nature after observing inclusion. Unexpectedly, observers' degree of attachment anxiety did not moderate the effect of observed experience on their antisocial behavioral inclinations (whether assessed as endorsement of aggressive norms or accessibility of aggressive cognitions).

In contrast, whereas observers' levels of attachment avoidance did not moderate the effect of observed experience on their beliefs about human nature, it did moderate (although only marginally) the impact of observed experience on their antisocial behavioral inclinations, at least in terms of their endorsement of aggressive norms. However, while the effect of attachment avoidance appeared primarily after witnessing ostracism, as predicted, it was not in the expected

direction: Following the observation of ostracism, those relatively high in attachment avoidance reported increased, rather than decreased, endorsement of aggressive norms.

Ancillary Objectives

Beyond its primary goal, the present study also had two ancillary objectives. The first was to assess the (hyper)activation or deactivation of observers' attachment systems in response to observing ostracism and inclusion through RTs to attachment-related positive and negative words in a LDT. It was hypothesized that compared to a neutral control condition, after observing ostracism and inclusion, attachment anxiety would be negatively associated with RTs to positive and negative attachment-related words; indicating hyperactivation of the attachment system (Hypothesis 3a). Conversely, it was predicted that relative to a neutral control condition, after observing ostracism (but not inclusion) attachment avoidance would be positively associated with RTs to positive and negative attachment-related words; indicating deactivation of the attachment system (3b).

The second ancillary objective was to determine if attachment might moderate the effect of observing ostracism on observers' impressions of the perpetrators. It was hypothesized that after witnessing ostracism and inclusion, relative to a neutral control condition, attachment anxiety would be negatively associated with observers' impressions of the perpetrators (Hypothesis 4a). In contrast, after viewing ostracism (but not inclusion), compared to a neutral control condition, attachment avoidance was anticipated to be positively related to observers' impressions of the perpetrators (4b). None of the hypotheses related to these ancillary objectives were supported.

Analysis and Interpretation of Findings

How might one explain the obtained pattern of results? To account for the decline in the beliefs about human nature evidenced by observers relatively low (as opposed to relatively high) in attachment anxiety, one might posit that, despite witnessing a potentially threatening event that might have activated their pessimistic views about others, the views held by those relatively high in attachment anxiety might already be so negative that they cannot easily be made anymore unfavorable. Thus, although the beliefs of those relatively high in attachment anxiety were generally more negative than those relatively low in attachment anxiety, the negativity of their beliefs did not change after witnessing ostracism (or inclusion). In contrast, those relatively low in attachment anxiety (i.e., those more secure) generally hold more positive and optimistic beliefs and expectations about others. They also often respond adaptively and constructively to threatening situations and tend to revise their representations of other people when faced with information that challenges those representations (Mikulincer, 1997; Mikulincer & Arad, 1999; Mikulincer & Florian, 1998; Mikulincer et al., 2003). As such, they would be more likely to alter their beliefs (at least temporarily) in light of the negative behavior they witnessed in the observed ostracism condition. Moreover, although observing inclusion might be more positive than observing ostracism (Giesen & Echterhoff, 2018), when comparisons are made between observations of inclusion and a neutral control condition, which allows for the identification of the specific effects of observing inclusion, it is plausible that observing inclusion might still be somewhat distressing for observers because they themselves are not being included. Indeed, in the observed inclusion condition the observer is singled out to passively watch the inclusive interaction between the three other participants and is unable to interact with them in anyway. Thus, although this condition displays an overall positive situation, it may actually operate as a partially ostracizing experience for observers who might interpret their separation and distance

from the inclusive interaction in threatening terms and respond with distress. The possibility that observers might find observing inclusion distressing might help to explain why those relatively low in attachment anxiety tended to report less positive beliefs about human nature after observing inclusion.

Observers' level of attachment avoidance did not moderate the effect of observed experience on their beliefs about human nature. Yet, attachment theory and related research suggests that avoidantly attached individuals are likely to employ deactivating affect regulation strategies and respond to threatening events and stimuli by suppressing any distress these situations might evoke (e.g., Fraley & Shaver, 1997; Mikulincer & Shaver, 2016; Mikulincer et al., 2003). Therefore, to the extent that observing ostracism (but not inclusion) poses an attachment-relevant threat for avoidantly attached persons, observing such an act should have activated their attachment systems and with it their typical mode of affect regulation. As a result, their negative beliefs about others should have been inhibited and unable to influence their subsequent judgements regarding human nature, ultimately leading them to report more favorable views. There are several potential explanations for this absence of moderation. First, highly avoidant individuals may simply not have been impacted by observing ostracism. Indeed, research indicates that greater attachment avoidance predicts reduced feelings of empathy in response to another person's distress as well as lower moral concerns regarding harm and fairness (Koleva, Selterman, Iyer, Ditto, & Graham, 2014; Mikulincer et al., 2001). Second, their distance from the observed interaction may also have minimized the degree to which viewing ostracism may have constituted an attachment-relevant threat. Thus, if highly avoidantly attached persons were not affected by what they saw, the entire hypothesized process by which their beliefs would have changed would have been undercut. However, that attachment avoidance did

moderate the effect of observed experience on observers' endorsement of aggressive norms suggests that highly avoidant individuals were in some way impacted by the interactions they observed.

Although observers' degree of attachment avoidance did not moderate the effect of observed experience on their beliefs about human nature, it did have a moderating influence on their endorsement of aggressive norms. Specifically, individuals higher in attachment avoidance were more rather than less likely to endorse aggressive norms, particularly after observing ostracism. These findings run counter to predictions and seem difficult to reconcile with the absence of a moderation effect on participants' views of human nature. However, endorsing aggressive norms may be a self-affirming approach for highly avoidant individuals to confront the negative affect that may have been elicited by observing ostracism. That is, endorsing aggressive behavior toward others may have been an indirect form of self-enhancement for participants high in attachment avoidance in that it may have allowed them to bolster their sense of self-efficacy and competence, and increase their feelings of strength and control. Moreover, endorsing aggressive norms may also have allowed highly avoidant individuals to dampen latent attachment-related concerns that may have resurfaced after the observed experience. In fact, prior research indicates that avoidantly attached individuals defensively seek to maintain a positive self-conception and engage in self-enhancement when threatened (Hart, Shaver, & Goldenberg, 2005; Mikulincer et al., 2004).

Endorsing aggressive norms may have served a self-affirming function for participants high in attachment avoidance perhaps because these individuals may have imagined themselves engaging in the various behaviors before indicating their level of acceptance of them. Many of the behaviors are not only highly active and agentic and would likely involve dominating or

controlling others, but would also probably lead others to distance themselves from those who perpetrated them. As such, visualizing themselves engaging in these behaviors would likely have reduced any feelings of vulnerability highly avoidant individuals may have been experiencing by simultaneously affording them the opportunity to reaffirm their sense of self-efficacy and control as well as their disdain for intimacy and dependence. Consequently, the affirmation provided by imagining perpetrating the aggressive behaviors may have led participants high in attachment avoidance to more strongly endorse those behaviors as normative.

It is currently unclear why the moderating influence of attachment avoidance was evident on observers' endorsement of aggressive norms, whereas it was absent on their beliefs about human nature. However, effects may have been more pronounced on the aggressive-relevant dependent measure due to the defensive tendencies of those high in attachment avoidance. For example, research has documented that individuals high in attachment avoidance display more defensive, hostile reactions to the hurtful behavior of their relationship partners. These reactions include not only distancing themselves from their partners, but also the open expression of anger, arguing, and vengeful or hurtful remarks (e.g., Cassidy et al., 2009). Thus, it is possible that expressing and endorsing aggression might help individuals high in attachment avoidance deny feelings of vulnerability and maintain a positive self-conception when threatened in a way that altering their views of human nature might not.

Unlike observers' degree of attachment avoidance, their levels of attachment anxiety did not moderate the effect of observed experience on their endorsement of aggressive norms. The lack of a moderating effect of attachment anxiety was unexpected and seems inconsistent with the moderating influence found for observers' beliefs about human nature. Given that engaging in aggressive acts may frequently result in the loss of relations with others, highly anxiously

attached individuals may have opposed the acceptability of such behavior because endorsing them may have been perceived as challenging and denying their immense need for social connection. Thus, despite the potential salience of their negative beliefs about others after observing ostracism (and inclusion), highly anxiously attached individuals' fixation on developing and maintaining social relations may have resulted in no significant change in their endorsement of aggressive norms. Moreover, because secure individuals (i.e., those relatively low in attachment anxiety) evidence positive, constructive responses to threat and conflict, they would be unlikely to endorse aggressive norms even after observing ostracism (or inclusion). In sum, the effects of attachment anxiety on reactions to observing ostracism and inclusion might therefore be more evident for trust-relevant rather than aggression-relevant outcomes.

There were no significant interactions between either of the attachment dimensions and observed experience on aggression-related word completions, RTs to attachment-related words, or impressions of the perpetrators and target. It is unclear why there were no effects on these outcomes. However, the former two measures assess implicit constructs, aggressive cognitions and activation (or lack thereof) of the attachment system respectively. Given that the tasks that assess these constructs measure heightened accessibility or activation in response to situations and stimuli which would be expected to dissipate over time, it is possible that various experiences, unless they are highly impactful, might only have a relatively small, short-lived, and fleeting effect on them. Indeed, the electronic and internet mediated nature of the observations of ostracism and inclusion as well as the presence of inattentive or careless responders in the final sample may have combined to limit the impact of the experimental manipulation. These potential limitations are discussed in more detail below. However, holding these factors as the sole explanations for the lack of effects on these outcomes is rather tenuous given that effects of the

manipulation, both on its own and in concert with attachment, were found for other measures, and that computations of these outcomes somewhat account for inattention (e.g., RTs in the LDT were calculated only on correct trials and accessibility of aggression cognitions was computed as a ratio of aggression-related word completions to all completions).

It is even more puzzling why there were no interactions on impressions of the perpetrators and target. However, as suggested earlier, the moderating influence of attachment avoidance might be most evident for aggression-relevant outcomes. Given that the impression measure was quite similar to the measure assessing beliefs about human nature (e.g., in terms of the characteristics being evaluated), this might account for why there was no interaction between attachment avoidance and observed experience. As to why there was no moderating effect of attachment anxiety, it might be that like beliefs about human nature, the impressions of observers high in attachment anxiety could not be shifted to become anymore negative. Alternatively, in line with their desire to develop connections with others, observers high in attachment anxiety may not have decreased their impressions of the ostensible players because they were hopeful about potentially associating with them. Conversely, participants low in attachment anxiety may have found it easier to revise their relatively more abstract beliefs about others in general (e.g., they may have been uncomfortable with derogating the other participants or may have made positive attributions that discounted the perpetrators' negative behavior). However, it should be noted that if there was overlap between the impression and beliefs about human nature measures (and participants responded to them in relatively the same way) then like beliefs about human nature an interaction between attachment anxiety and observed experience should perhaps have emerged on impressions. Thus, it is still unclear why there was no moderating influence of attachment anxiety on observers' impressions of the perpetrators and target.

Unexpectedly, there was a significant interaction between participant sex and observed experience on impressions of both the perpetrators and target. Specifically, whereas male and female participants did not differ in their impressions of the perpetrators after observing ostracism, they did diverge in their impressions of the perpetrators after observing inclusion, and in their impressions of the target across both conditions, with male participants reporting less positive impressions in each case. Thus, while men generally provided less positive evaluations of all the ostensible players across the observed interactions, the evaluations provided by women only matched the negativity of those of men after observations of ostracism. These findings are broadly consistent with prior research indicating that women tend to be more negatively impacted than men by direct experiences with ostracism and seem to imply that women might also react quite strongly to observing ostracism, perhaps more so than men.

Theoretical and Practical Implications

Despite inconsistencies with hypotheses, the results of this study have several important theoretical and practical implications. Indeed, this study contributes to theory and research on the effects of attachment and ostracism in a number of ways. First, while the majority of theorizing and research on attachment has generally considered the influence of attachment patterns on individuals' behavior in close relationships, such as with parents and romantic partners (Mikulincer & Shaver, 2016), attachment history is increasingly being viewed as an important foundational basis for individuals' orientations to the broader social world. For instance, differences in attachment security have been linked to distinct ideological beliefs and motivational preferences (e.g., promotion focus; Blalock, Franzese, Machell, & Strauman, 2015; Weber & Federico, 2007). Thus, by indicating that individuals' level of attachment security has the capacity to influence their reactions to the behavior of complete strangers, this study further

demonstrates the applicability and utility of attachment history to predicting the cognitive, affective, and behavioral responses of individuals to experiences outside of relationships with significant others. Second, the findings of this study perhaps suggest that conceptualizing the attachment dimensions of avoidance and anxiety strictly in terms of the valence of underlying working models of self and others might be somewhat restrictive and oversimplified. Indeed, recent extensions of attachment theory, while accepting the existence and importance of working models, are less beholden to the purported valence of individuals' models when interpreting their behavior. Instead, these conceptualizations are focused on the degree to which self-reports of attachment reflect differences in the use of hyperactivating or deactivating strategies of affect regulation and the implications of these divergent strategies for interpersonal functioning (e.g., Mikulincer & Shaver, 2016). Thus, these alternative perspectives on attachment are able to acknowledge, for instance, that individuals high in attachment anxiety, may frequently report, as they did in this study and in contrast to their theorized working models, negative views of others. Third, by indicating that dispositional attachment can moderate responses to merely witnessing ostracism this study extends both prior research reporting moderation by attachment of reactions to direct experiences with ostracism (e.g., Yaakobi & Williams, 2016a) as well as research on vicarious ostracism (which up to this point has not extensively evaluated potential moderators of the effect of witnessing such experiences and has not considered the influence of observers' attachment orientations). Fourth, this study directly advances our understanding of the effects of observing ostracism. In fact, while past work has examined the tendency for targets of ostracism to display aggressive and antisocial responses, no research has directly and experimentally evaluated the possibility that witnessing ostracism might also elicit similar reactions (Leary, Twenge, & Quinlivan, 2006). Moreover, no research has assessed whether observing ostracism

might impact individuals' general perceptions of others (i.e., their view of human nature). Thus, by demonstrating that for some individuals witnessing ostracism (and inclusion) may engender more negative views of others and aggressive, antisocial inclinations, this study not only expands the list of outcomes known to be affected by observing ostracism, but also identifies one of the boundary conditions of such effects. Finally, by revealing negative reactions to observations of inclusion the results of this study suggest that witnessing inclusion may at times function as a distressing experience. Thus, while being directly included may generally be experienced positively, this study indicates that this might not always be the case with observations of inclusion. Specifically, under certain circumstances observing ostensibly positive interactions among others may elicit feelings of exclusion and rejection, particularly if, for instance, the situation highlights that the observer could be included (e.g., they share an identity, group membership, or relationship with one or all of the interactants). Notably, past work has not extensively evaluated the effects of inclusion on its own (whether direct or observed) and has instead simply utilized it as a comparison with ostracism as a control condition (e.g., Williams, 2009). As a result, the findings of this study not only contribute to recent efforts to examine the specific, unique effects of inclusion (e.g., Simard & Dandeneau, 2018), but perhaps also call for an expansion of the kind of situations that might be classified as ostracizing.

The findings of this study may also have a number of practical, real-world consequences beyond their contribution to our knowledge of attachment and vicarious ostracism. The importance and applicability of the results of this study are underscored by how common instances of ostracism are as well as the high likelihood that uninvolved individuals will frequently witness such acts, whether between peers at school, colleagues at work, or family members at home. Specifically, while acknowledging that the interaction between observers'

level of attachment avoidance and observed experience was only marginally significant, the results of this study tentatively suggest that, in schools or in workplaces, for instance, if individuals observe an act of ostracism, even one occurring between relative strangers, and those individuals are high in attachment avoidance, they may consequently feel that it is acceptable to act in a variety of aggressive ways toward others.

Believing aggressive acts are acceptable and normal may potentially have several consequences not only for how individuals subsequently react to witnessed exchanges between others, but also for how they themselves act in future interactions. First, perceiving aggression as normative may lead them to be less disturbed by seeing others subjected to aggressive behavior, which may undercut the likelihood that they intervene to assist the target (either immediately to stop the mistreatment or later to alleviate the target's distress). Second, it may also propel them to engage in such behaviors themselves. These consequences may result because these individuals might feel that aggressive actions are justified, deserved, and necessary (Rotter, 1980; Wenzel et al., 2017). That is, because they may think that others are particularly likely to engage in aggressive actions they may come to the conclusion that (a) they need to act aggressively to protect themselves, and (b) that targets of such behavior should have anticipated their mistreatment, and acted to preempt it, and thus because they were targeted, they deserved it. Both being less perturbed by others' mistreatment and engaging in more aggressive acts may, particularly if the latter elicits reciprocal aggressive behavior from others, create a self-fulfilling prophecy that reinforces individuals' beliefs about the acceptability of aggressive actions (Kelley & Stahelski, 1970). Thus, witnessing ostracism in tandem with high levels of attachment avoidance may perpetuate a variety of negative interpersonal interactions, including other instances of ostracism.

The observed differences between male and female participants in their impressions of the perpetrators and target after observing ostracism and inclusion may also have important practical implications. Specifically, the finding that women might potentially be more reactive to observing ostracism might suggest that in male-dominated institutions, workplaces, or peer groups, instances of ostracism and the effects of such acts on targets (but perhaps also perpetrators, and observers) may not be taken as seriously as they should be given their widely documented negative consequences (e.g., Williams, 2009). Relatedly, the results of this study might also suggest that in these same contexts women might feel a burden to intervene to assist targets (either directly in the moment or indirectly by contacting administration or management to prevent future ostracism), which might not only be emotionally draining, and thus potentially detrimental to their psychological well-being and productivity, but might also generate friction with or resentment from male peers or colleagues who, due to their potential lower reactivity to ostracism and less positive impressions of targets, might perceive intervention by female coworkers or peers as “overstepping”, unnecessary, or as “complaining” (perhaps analogous to how women who confront sexism are perceived as complainers; Eliezer & Major, 2012). Admittedly, however, this interpretation is speculative.

Limitations and Future Directions

Despite its novel findings and potential important implications, this study is not without its limitations. The majority of the limitations of the current study concern power. As already noted, I was uncertain about what size of an effect should have been expected for interactions between attachment and observations of ostracism. As a result, I sought to recruit as many participants as possible. Indeed, the sample size on which final analyses were performed exceeds my initial best guess estimate by over 100 participants. However, in light of the small size of

obtained effects and the fact that several effects, particularly some of the key interactions between attachment and observed experience were just shy of conventional levels of statistical significance, it is likely that the size of the final sample may have been insufficient. Future research examining this topic with a similar paradigm should be cognizant of the possibility that obtained effects may be small and thus that a large sample will be needed. Utilizing the effect sizes from this study in power analyses should help ensure that future researchers have a more accurate estimate of the sample size they might need to recruit in order to have sufficient power.

Although the size of obtained effects were small according to established conventions, given that various psychological constructs, including individuals' beliefs about human nature and endorsement of aggressive norms, are likely multiply determined, it should be recognized (and has been demonstrated mathematically and in simulation studies; Ahadi & Diener, 1989; Strube, 1991) that the size of the effect of any single predictor will be constrained and often quite small. Moreover, it should be noted that attention to context is key when interpreting and determining the meaningfulness of effect sizes. Specifically, small effects may be meaningful and have important consequences if they (a) have the potential to have a broad impact (i.e., may affect a lot of people), (b) compound or accumulate into larger effects, (c) make a valuable contribution to our knowledge (e.g., challenge assumptions or suggest new lines of inquiry), or (d) are found under circumstances or with manipulations that make their occurrence unlikely (Abelson, 1985; Cortina & Landis, 2008; Ellis, 2010; Greenwald, Banaji, & Nosek, 2015; Rosenthal, 2000; Swann, Chang-Schneider, & McClarty, 2007). Due to how common instances of ostracism are and the wide variety of contexts in which they occur, it is likely that many individuals will frequently and repeatedly witness such acts. Thus, the initial small influence of observations of ostracism, on say endorsement of aggressive norms, may quickly translate into

big effects that affect a large number of people, and which may ultimately precipitate engagement in a variety of aggressive, antisocial behaviors. In addition, the effects of observations of ostracism and particularly inclusion obtained in this study are novel, and thus demonstrating their occurrence is meaningful, despite their size, because they not only suggest new avenues for research, but potentially also, at least in the case of observations of inclusion, challenge unexamined assumptions about the inherent positivity of such events. Finally, the meaningfulness of the effects found in this study might be highlighted by the fact that any effects were found given how brief and relatively abstract the observed experience manipulation was. Overall, small effect sizes should not be reflexively trivialized, and indeed properly contextualizing and interpreting small effects can reveal that they can have wide-ranging and important implications.

The power of this study might also have been hampered in a number of ways by its online context. First, the strength of the manipulation of observed experience may have been reduced because participants were doubly distant from the observed experience. That is, not only were they third-party observers, but the entire interaction may also have been made more abstract and remote as a result of it taking place online. Moreover, given that online interactions might be perceived as quite transitory and fleeting, a perception that may have been heightened in the context of a relatively anonymous research study, participants may have downplayed the importance and meaningfulness of the observed interaction for all those involved. In fact, the majority of research examining ostracism (direct and observed) using Cyberball has brought participants into the laboratory and led them to believe that the ostensible players are close by, for example in an adjacent room or nearby building (e.g., Wesselmann et al., 2013; Williams, 2009). Thus, while these participants' experiences with ostracism are still computer-mediated, as

they were for participants in this study, the interaction they observe or take part in, as well as the individuals involved in it may be more immediate and tangible. Thus, it might be beneficial for future research seeking to replicate or extend this study if it was conducted in-person, rather than over the internet, and actually involved bringing participants into the laboratory.

Second, the online format of this study may also have limited power due to participant inattention and suspicion. Given that (a) participants could have accessed the study website from their personal computers at any time and from any location, and (b) people tend to multitask while using a computer, it is possible that their attention was not fully on the study while they were completing it (i.e., they may have been simultaneously completing other online studies, browsing the web, or working on course assignments). Inattentive participants may have been less affected by the observed experience manipulation or may have adopted a careless or relatively random response style while completing the study. Although the manipulation check might be seen as a stand-in attention check, because the manipulation occurred relatively early in the study, it would not have caught participants who became inattentive and careless after being exposed to the manipulation. Therefore, it is likely that some inattentive participants remained in the sample. The presence of inattentive participants in the sample may have introduced additional error variance and reduced the size of effects and reliability of measurement, and consequently power (Berinsky, Margolis, & Sances, 2014; Maniaci & Rogge, 2014; Osborne & Blanchard, 2011). Similarly, although steps were taken to try to ensure that the cover story was as realistic as possible (e.g., planned pauses occurred during the study with progress bars indicating other participants were connecting to the study website), it is possible that some participants may have been skeptical about the reality of the ostensible participants, particularly if, for example, they were completing the study at an unusual time. Suspicious participants may

have primarily been less affected by the manipulation, but their suspicion may also have led them to respond in a careless manner, perhaps because they felt less invested in a “fake” study or because they became upset when they perceived they may have been deceived. However, this suggestion is speculative, and it should be noted that some research suggests, at least with direct experiences with ostracism in Cyberball, that individuals are still negatively affected even when they are made aware that the interaction is computer-generated or scripted (Zadro, Williams, Richardson, 2004). Given the documented overlap in responses to direct and vicarious ostracism, it is possible this may also be the case with observations of ostracism. Thus, it is somewhat unclear what impact the inclusion of suspicious participants may have had on obtained effects and the power to detect them. Future studies might rectify these limitations by including items or scales designed to detect inattentive or suspicious participants (e.g., Maniaci & Rogge, 2014; Marjanovic, Struthers, Cribbie, & Greenglass, 2014). However, it should be noted that inattentive responding has been linked with a variety of individual differences and demographic characteristics. As such, dropping participants identified as inattentive may threaten the external and internal validity of a study (Berinsky et al., 2014; Maniaci & Rogge, 2014).

The choice of particular measures may also have reduced the power of the current study. This limitation refers specifically to my decision to use the R-PHN to assess participants’ beliefs about human nature. This scale was initially developed in the 1960s and subsequently revised in the 1970s. As a result, it is possible that the content and language of some of the items it contains may no longer be particularly relevant to 21st century university students. For example, phrases like “when the chips are down” or “putting themselves out” might be considered old-fashioned and might be relatively foreign to today’s young adults. Moreover, several items refer explicitly to religious sentiments (e.g., applying the Golden Rule), which, in light of declines in religious

affiliation and attendance among adolescents and young adults, might not have resonated with participants (Pew Research Center, 2013; Twenge, Exline, Grubbs, Sastry, & Campbell, 2015; Twenge, Sherman, Exline, & Grubbs, 2016). When responding to items the meaning of which they are unsure about or which they perceive as less relevant to themselves, participants might be inclined to respond moderately, at the relative midpoint of the scale, rather than use the extremes. In contrast, there might be more variability when the items are clear and relevant to participants, and thus the potential for greater divergence in responses as a function of various manipulations or individual differences. As a result, to the extent that participants found the language and content of the items on the R-PHN relatively foreign and irrelevant, utilizing the R-PHN may have limited the detection of effects. The effects of observing ostracism (and inclusion) either on its own or in concert with attachment on beliefs about human nature might be easier to detect with measures that are simpler and clearer, such as the Trust in People scale (Survey Research Center, 1969; Wrightsman, 1992). Although this scale is not quite as comprehensive as the R-PHN and is similarly aged, its items are potentially more straight-forward and to-the-point. For example, it directly asks if people can be trusted or not, if they are helpful or selfish, and if they will try to be fair or take advantage of others. Future research might consider using this or other similar scales that might resonate more strongly with participants.

The final two limitations of the present study also refer to the type of outcomes that were assessed. The first relates to my decision not to include measures evaluating participants' affect and need satisfaction, outcomes that have been shown to be heavily affected by direct and observed experiences of ostracism (e.g., Wesselmann et al., 2009; Williams, 2009). These measures were not included in order to keep the length of the study from fatiguing participants and to focus on more novel outcomes. However, in light of the lack of interaction effects on the

LDT, future research might assess these outcomes as they might provide a way, albeit an indirect one, of evaluating how threatened participants might have been by observing ostracism (and inclusion) and consequently whether their attachment systems were hyperactivated or deactivated.

The final limitation of the present study is that it only examined the interactive effect of observations of ostracism and attachment on individuals' perceptions and inclinations. Although prior research has not evaluated the effect of these variables on such outcomes, and thus the results of the current study are novel, it leaves as an open question how observations of ostracism and attachment might interact to affect observers' actual behavior. As a result, future research would benefit from examining behavioral outcomes, particularly the performance of aggressive actions, and whether those higher in attachment avoidance might be more likely to engage in such behaviors after observing ostracism.

While evaluating the interplay between observations of ostracism and attachment on behavior would be an important step forward, it would be equally, if not more important to determine the mechanisms that might underlie a potential increase in aggressive behavior by those high in attachment avoidance after observing ostracism. As suggested by the results of this study, future research might assess whether greater endorsement of aggressive norms mediates the relationship between observations of ostracism and performance of aggressive behavior for observers high in attachment avoidance. In fact, in light of the proposed mechanism linking the observation of ostracism to increased acceptance of aggressive behavior by individuals high in attachment avoidance, future studies might test a serial mediation model in which observing ostracism leads those high in attachment avoidance to experience declines in feelings of self-

competence which motivates them to more strongly endorse aggressive norms, and which in turn leads them to display higher levels of aggressive behavior.

In addition to assessing which variables might lead individuals to evince greater levels of aggressive behavior after observing ostracism, future research should also examine the factors that might not only circumvent the likelihood that observers react aggressively, but also spur them to intercede on the target's behalf. Indeed, intervention by observers likely has myriad positive outcomes for targets (e.g., improving their mood) as well as the broader environment, such as a school or workplace community, in which the instance of ostracism occurred (e.g., by modeling or generating norms of inclusion). Thus, identifying the factors that undercut antisocial, aggressive reactions to observations of ostracism while promoting prosocial responses has potentially wide-ranging intra-and-interpersonal consequences. Indeed, given that individuals low in attachment anxiety (i.e., those more secure) tended to report less favorable views of others after observing ostracism but were not more likely to endorse aggressive norms, the results of this study suggest that one such factor might be a sense of attachment security. Future research should more directly examine whether attachment security might not only counter aggressive responses, but also encourage prosocial reactions to observing ostracism.

Conclusion

Humans are social animals. As such, we have a need to develop relationships with one another. The loss of these connections, such as by ostracism, is often quite distressing and painful (e.g., Williams, 2009). Unfortunately, instances of ostracism occur frequently in schools, workplaces, and intimate relationships (Faulkner, Williams, Sherman, & Williams, 1997, as cited in Williams, 2001; Fox & Stallworth, 2005; Wang, Iannotti, & Nansel, 2009). Moreover, acts of ostracism may frequently involve not only targets and perpetrators, but also outside observers

(Atlas & Pepler, 1998; Craig & Pepler, 1997; Rivers, Poteat, Noret, & Ashurst, 2009). The current study sought to determine whether witnessing ostracism, and perhaps also inclusion in some cases, might reduce the favorability of observers' view of human nature and increase their antisocial behavioral inclinations. It also examined whether individual differences in observers' dispositional attachment might moderate these effects. Although several findings failed to reach conventional levels of statistical significance, results generally supported the applicability of attachment history as a framework for predicting reactions to observing ostracism and indicated that after observing ostracism (a) observers low in attachment anxiety tended to report less favorable views of human nature, and (b) that observers high in attachment avoidance tended to display increased antisocial behavioral inclinations (in form of greater endorsement of aggressive norms). Thus, this study tentatively suggests that for some individuals, observing ostracism may have the capacity to alter their views of other people in general and the degree to which they believe it is acceptable to harm them. Ultimately, by reducing the favorability of individuals' views of others, and especially by increasing the perceived normativity of aggression, observing ostracism may potentially perpetuate ostracism as well as a host of other negative interpersonal behaviors.

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Table 1
Descriptive Statistics for the Main Dependent Variables in each Observed Experience Condition

Dependent variable	Observed experience								
	Control			Observed inclusion			Observed ostracism		
	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Att. anxiety	5.43	1.85	153	5.12	1.67	223	5.20	1.83	250
Att. avoidance	4.13	1.65	153	4.09	1.59	223	4.44	1.70	251
Att. word RTs combined	565.66	61.09	152	565.10	74.35	219	568.62	80.99	240
Negative att. word RTs	568.40	65.37	152	574.09	79.70	219	573.89	80.66	240
Positive att. word RTs	561.91	62.74	151	557.90	76.27	219	563.36	88.65	240
Total human nature beliefs	3.40	0.53	153	3.42	0.50	223	3.35	0.46	251
Cynical beliefs	3.25	0.68	153	3.29	0.69	223	3.22	0.65	251
Goodness beliefs	3.55	0.65	153	3.56	0.66	223	3.48	0.65	251
Agg. cogs	0.21	0.06	152	0.21	0.06	222	0.22	0.06	251
Endors. agg. norms	1.23	0.25	153	1.34	0.45	222	1.29	0.38	250
Endors. agg. rel. norms	1.27	0.30	153	1.39	0.48	222	1.33	0.42	250
Enors. agg. phy. norms	1.18	0.26	153	1.29	0.46	222	1.26	0.40	250
Perp. imp	5.08	0.80	152	4.49	0.61	223	3.90	0.68	250
Targ. imp	4.75	0.89	152	4.61	0.86	222	4.65	0.87	250

Note. Att. = attachment; RTs = reaction times; Agg. = aggressive; cogs. = cognitions; endors. = endorsement; rel. = relational; phy. = physical; perp. = perpetrator; targ. = target; imp. = impressions. RTs were scored milliseconds. Beliefs about human nature were scored such that higher scores indicate more positive beliefs. Endorsement of aggressive norms was scored such that higher scores indicate more endorsement. Impressions were scored such that higher scores indicate more positive impressions. Aggressive cognitions were scored such that higher scores indicate more aggression-related word completions.

Table 2
Intercorrelations among the Main Dependent Variables

Dependent Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Att. anxiety	—													
2. Att. avoidance	.05	—												
3. Att. word RTs combined	-.12**	-.01	—											
4. Negative att. word RTs	-.12**	-.02	.95**	—										
5. Positive att. word RTs	-.10*	-.003	.95**	.82**	—									
6. Total human nature beliefs	-.15**	-.09*	.02	.03	-.01	—								
7. Cynical beliefs	-.20**	.04	.08†	.09*	.05	.75**	—							
8. Goodness beliefs	-.02	-.17**	-.06	-.04	-.06	.73**	.10*	—						
9. Agg. cogs	.03	.07†	.002	.01	-.01	-.09*	-.07†	-.07†	—					
10. Endors. agg. norms	.05	.08*	.01	.01	.02	-.17**	-.15**	-.11**	.05	—				
11. Endors. agg. rel. norms	.08*	.09*	.02	.02	.02	-.18**	-.14**	-.12**	.03	.94**	—			
12. Endors. agg. phy. Norms	.02	.06	-.00003	-.01	.01	-.14**	-.14**	-.07†	.07†	.94**	.76**	—		
13. Perp. imp	-.07	-.13**	.02	.02	.02	.13**	.06	.12**	-.07†	-.13**	-.12**	-.12**	—	
14. Targ. imp	.02	-.12**	-.02	.01	-.03	.07†	.03	.07†	-.10*	-.19**	-.14**	-.21**	.33**	—

Note. Att. = attachment; RTs = reaction times; Agg. = aggressive; cogs. = cognitions; endors. = endorsement; rel. = relational; phy. = physical; perp. = perpetrator; targ. = target; imp. = impressions. RTs were scored in milliseconds. Beliefs about human nature were scored such that higher scores indicate more positive beliefs. Endorsement of aggressive norms was scored such that higher scores indicate more endorsement. Impressions were scored such that higher scores indicate more positive impressions. Aggressive cognitions were scored such that higher scores indicate more aggression-related word completions. † $p < .10$ * $p < .05$ ** $p < .01$

Table 3
Hierarchical Regression Analysis of Total Beliefs About Human Nature

Step/predictor	Step 1	Step 2
1. Ostracism contrast	-0.05	-0.05
2. Inclusion contrast	0.02	-0.04
3. Attachment anxiety	-0.05***	-0.09***
4. Attachment avoidance	-0.02†	-0.003
5. Participant sex	0.16***	0.14
6. Attachment avoidance × ostracism contrast	—	-0.02
7. Attachment avoidance × inclusion contrast	—	-0.03
8. Attachment anxiety × ostracism contrast	—	0.06*
9. Attachment anxiety × inclusion contrast	—	0.04
10. Sex × ostracism contrast	—	-0.01
11. Sex × inclusion contrast	—	0.08
R^2	.06***	.07***
ΔR^2		.01
ΔR^2 due to attachment anxiety × observed experience		.01†
ΔR^2 due to attachment avoidance × observed experience		.001

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Beliefs about human nature were scored such that higher scores indicate more positive beliefs. † $p < .10$ * $p < .05$ *** $p < .001$

Table 4
Hierarchical Regression Analysis of Beliefs that People are Good

Step/predictor	Step 1	Step 2
1. Ostracism contrast	-0.05	-0.15
2. Inclusion contrast	0.01	-0.07
3. Attachment anxiety	-0.01	-0.05
4. Attachment avoidance	-0.06***	-0.07*
5. Participant sex	0.10†	0.02
6. Attachment avoidance × ostracism contrast	—	0.04
7. Attachment avoidance × inclusion contrast	—	-0.02
8. Attachment anxiety × ostracism contrast	—	0.05
9. Attachment anxiety × inclusion contrast	—	0.05
10. Sex × ostracism contrast	—	0.13
11. Sex × inclusion contrast	—	0.10
R^2	.04***	.05**
ΔR^2		.003
ΔR^2 due to attachment anxiety × observed experience		.003
ΔR^2 due to attachment avoidance × observed experience		.004

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Beliefs that people are good were scored such that higher scores indicate more positive beliefs. † $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

Table 5
Hierarchical Regression Analysis of Cynical Beliefs About Others

Step/predictor	Step 1	Step 2
1. Ostracism contrast	-0.04	0.05
2. Inclusion contrast	0.03	-0.02
3. Attachment anxiety	-0.09***	-0.13***
4. Attachment avoidance	0.02	0.07*
5. Participant sex	0.21***	0.26*
6. Attachment avoidance × ostracism contrast	—	-0.08†
7. Attachment avoidance × inclusion contrast	—	-0.04
8. Attachment anxiety × ostracism contrast	—	0.08*
9. Attachment anxiety × inclusion contrast	—	0.03
10. Sex × ostracism contrast	—	-0.14
11. Sex × inclusion contrast	—	0.06
R^2	.065***	.080***
ΔR^2		.02
ΔR^2 due to attachment anxiety × observed experience		.01†
ΔR^2 due to attachment avoidance × observed experience		.01

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Cynical beliefs were scored such that higher scores indicate less cynical beliefs. † $p < .10$ * $p < .05$ *** $p < .001$

Table 6
Hierarchical Regression Analysis of Endorsement of Aggressive Norms

Step/predictor	Step 1	Step 2
1. Ostracism contrast	0.06†	0.09
2. Inclusion contrast	0.11**	0.16*
3. Attachment anxiety	0.02*	0.03*
4. Attachment avoidance	0.02†	0.001
5. Participant sex	-0.16***	0.11*
6. Attachment avoidance × ostracism contrast	—	0.04*
7. Attachment avoidance × inclusion contrast	—	-0.001
8. Attachment anxiety × ostracism contrast	—	-0.01
9. Attachment anxiety × inclusion contrast	—	-0.01
10. Sex × ostracism contrast	—	-0.06
11. Sex × inclusion contrast	—	-0.09
R^2	.06***	.07***
ΔR^2		.01
ΔR^2 due to attachment anxiety × observed experience		.0004
ΔR^2 due to attachment avoidance × observed experience		.01†

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Endorsement of aggressive norms was scored such that higher scores indicate more endorsement. † $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

Table 7
Hierarchical Regression Analysis of Aggressive Cognitions

Step/predictor	Step 1	Step 2
1. Ostracism contrast	0.003	0.01
2. Inclusion contrast	0.002	0.01
3. Attachment anxiety	0.002	0.005†
4. Attachment avoidance	0.002	0.002
5. Participant sex	-0.01*	-0.01
6. Attachment avoidance × ostracism contrast	—	0.003
7. Attachment avoidance × inclusion contrast	—	-0.001
8. Attachment anxiety × ostracism contrast	—	-0.01†
9. Attachment anxiety × inclusion contrast	—	-0.002
10. Sex × ostracism contrast	—	-0.01
11. Sex × inclusion contrast	—	-0.01
R^2	.01	.02†
ΔR^2		.01
ΔR^2 due to attachment anxiety × observed experience		.005
ΔR^2 due to attachment avoidance × observed experience		.002

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Aggressive cognitions were scored such that higher scores indicate more aggression-related word completions. † $p < .10$ * $p < .05$

Table 8
Hierarchical Regression Analysis of Reaction Times to Positive and Negative Attachment-related Words Combined

Step/predictor	Step 1	Step 2
1. Ostracism contrast	2.14	-2.12
2. Inclusion contrast	-1.02	-10.45
3. Attachment anxiety	-5.02**	-6.34 †
4. Attachment avoidance	-0.07	0.13
5. Participant sex	2.52	-4.97
6. Attachment avoidance × ostracism contrast	—	0.08
7. Attachment avoidance × inclusion contrast	—	-0.90
8. Attachment anxiety × ostracism contrast	—	1.94
9. Attachment anxiety × inclusion contrast	—	1.88
10. Sex × ostracism contrast	—	5.86
11. Sex × inclusion contrast	—	14.56
R^2	.015	.017
ΔR^2		.002
ΔR^2 due to attachment anxiety × observed experience		.0004
ΔR^2 due to attachment avoidance × observed experience		.0001

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Reaction times were scored in milliseconds. † $p < .10$ ** $p < .01$

Table 9

Hierarchical Regression Analysis of Reaction Times to Negative Attachment-related Words

Step/predictor	Step 1	Step 2
1. Ostracism contrast	-4.97	0.92
2. Inclusion contrast	4.45	-3.72
3. Attachment anxiety	-5.37**	-7.43*
4. Attachment avoidance	-0.57	-1.38
5. Participant sex	6.44	-0.11
6. Attachment avoidance × ostracism contrast	—	2.03
7. Attachment avoidance × inclusion contrast	—	-0.65
8. Attachment anxiety × ostracism contrast	—	2.03
9. Attachment anxiety × inclusion contrast	—	4.34
10. Sex × ostracism contrast	—	5.21
11. Sex × inclusion contrast	—	12.63
R^2	.017†	.020
ΔR^2		.004
ΔR^2 due to attachment anxiety × observed experience		.001
ΔR^2 due to attachment avoidance × observed experience		.001

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Reaction times were scored in milliseconds. † $p < .10$ * $p < .05$ ** $p < .01$

Table 10
Hierarchical Regression Analysis of Reaction Times to Positive Attachment-related Words

Step/predictor	Step 1	Step 2
1. Ostracism contrast	0.43	-3.02
2. Inclusion contrast	-5.50	-15.07
3. Attachment anxiety	-4.44*	-4.45
4. Attachment avoidance	0.02	0.02
5. Participant sex	-0.98	-8.42
6. Attachment avoidance × ostracism contrast	—	-0.26
7. Attachment avoidance × inclusion contrast	—	0.46
8. Attachment anxiety × ostracism contrast	—	1.06
9. Attachment anxiety × inclusion contrast	—	-1.37
10. Sex × ostracism contrast	—	5.11
11. Sex × inclusion contrast	—	15.08
R^2	.011	.013
ΔR^2		.002
ΔR^2 due to attachment anxiety × observed experience		.001
ΔR^2 due to attachment avoidance × observed experience		.00004

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Reaction times were scored in milliseconds. * $p < .05$

Table 11
Hierarchical Regression Analysis of Reaction Times to Neutral Words

Step/predictor	Step 1	Step 2
1. Ostracism contrast	2.70	8.68
2. Inclusion contrast	-0.003	-1.30
3. Attachment anxiety	-2.09	-3.95
4. Attachment avoidance	-0.79	-1.32
5. Participant sex	-3.35	0.11
6. Attachment avoidance × ostracism contrast	—	1.54
7. Attachment avoidance × inclusion contrast	—	-0.99
8. Attachment anxiety × ostracism contrast	—	1.26
9. Attachment anxiety × inclusion contrast	—	4.35
10. Sex × ostracism contrast	—	-10.40
11. Sex × inclusion contrast	—	2.16
R^2	.004	.008
ΔR^2		.004
ΔR^2 due to attachment anxiety × observed experience		.002
ΔR^2 due to attachment avoidance × observed experience		.001

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Reaction times were scored in milliseconds.

Table 12
Hierarchical Regression Analysis of Accuracy in Lexical Decision Task for Positive and Negative Attachment-related Words Combined

Step/predictor	Step 1	Step 2
1. Ostracism contrast	-0.03	-0.04
2. Inclusion contrast	-0.01	-0.03
3. Attachment anxiety	-0.001	0.01
4. Attachment avoidance	-0.003	-0.01
5. Participant sex	0.01	-0.01
6. Attachment avoidance × ostracism contrast	—	0.01
7. Attachment avoidance × inclusion contrast	—	0.01
8. Attachment anxiety × ostracism contrast	—	-0.01
9. Attachment anxiety × inclusion contrast	—	-0.02
10. Sex × ostracism contrast	—	0.01
11. Sex × inclusion contrast	—	0.04
R^2	.007	.01
ΔR^2		.005
ΔR^2 due to attachment anxiety × observed experience		.003
ΔR^2 due to attachment avoidance × observed experience		.001

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1.

Table 13
Hierarchical Regression Analysis of Accuracy in Lexical Decision Task for Negative Attachment-related Words

Step/predictor	Step 1	Step 2
1. Ostracism contrast	-0.03 [†]	-0.03
2. Inclusion contrast	-0.005	-0.02
3. Attachment anxiety	-0.001	0.01
4. Attachment avoidance	-0.002	-0.003
5. Participant sex	0.02	0.01
6. Attachment avoidance × ostracism contrast	—	0.002
7. Attachment avoidance × inclusion contrast	—	-0.001
8. Attachment anxiety × ostracism contrast	—	-0.01
9. Attachment anxiety × inclusion contrast	—	-0.01
10. Sex × ostracism contrast	—	0.001
11. Sex × inclusion contrast	—	0.02
R^2	.009	.01
ΔR^2		.002
ΔR^2 due to attachment anxiety × observed experience		.002
ΔR^2 due to attachment avoidance × observed experience		.0001

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. [†] $p < .10$

Table 14
Hierarchical Regression Analysis of Accuracy in Lexical Decision Task for Positive Attachment-related Words

Step/predictor	Step 1	Step 2
1. Ostracism contrast	-0.02	-0.04
2. Inclusion contrast	-0.01	-0.04
3. Attachment anxiety	-0.001	0.01
4. Attachment avoidance	-0.05	-0.02
5. Participant sex	0.01	-0.02
6. Attachment avoidance × ostracism contrast	—	0.01
7. Attachment avoidance × inclusion contrast	—	0.02
8. Attachment anxiety × ostracism contrast	—	-0.004
9. Attachment anxiety × inclusion contrast	—	-0.02
10. Sex × ostracism contrast	—	0.03
11. Sex × inclusion contrast	—	0.05
R^2	.005	.013
ΔR^2		.008
ΔR^2 due to attachment anxiety × observed experience		.005
ΔR^2 due to attachment avoidance × observed experience		.003

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1.

Table 15

Hierarchical Regression Analysis of Accuracy in Lexical Decision Task for Neutral Words

Step/predictor	Step 1	Step 2
1. Ostracism contrast	-0.03	-0.02
2. Inclusion contrast	-0.004	-0.01
3. Attachment anxiety	-0.001	0.004
4. Attachment avoidance	-0.004	-0.01
5. Participant sex	0.01	0.01
6. Attachment avoidance × ostracism contrast	—	0.001
7. Attachment avoidance × inclusion contrast	—	0.01
8. Attachment anxiety × ostracism contrast	—	-0.01
9. Attachment anxiety × inclusion contrast	—	-0.01
10. Sex × ostracism contrast	—	-0.01
11. Sex × inclusion contrast	—	0.01
R^2	.007	.008
ΔR^2		.001
ΔR^2 due to attachment anxiety × observed experience		.001
ΔR^2 due to attachment avoidance × observed experience		.0004

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1.

Table 16
Hierarchical Regression Analysis of Impressions of Perpetrators

Step/predictor	Step 1	Step 2
1. Ostracism contrast	-1.16***	-0.84***
2. Inclusion contrast	-0.58***	-0.55***
3. Attachment anxiety	-0.05***	-0.05
4. Attachment avoidance	-0.04*	-0.06
5. Participant sex	0.27***	0.48***
6. Attachment avoidance × ostracism contrast	—	0.03
7. Attachment avoidance × inclusion contrast	—	0.01
8. Attachment anxiety × ostracism contrast	—	-0.02
9. Attachment anxiety × inclusion contrast	—	0.004
10. Sex × ostracism contrast	—	-0.50**
11. Sex × inclusion contrast	—	-0.02
R^2	.35***	.37***
ΔR^2		.02***
ΔR^2 due to attachment anxiety × observed experience		.001
ΔR^2 due to attachment avoidance × observed experience		.001

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Impressions were scored such that higher scores indicate more positive impressions. * $p < .05$ ** $p < .01$ *** $p < .001$

Table 17
Hierarchical Regression Analysis of Impressions of the Target

Step/predictor	Step 1	Step 2
1. Ostracism contrast	-0.06	-0.34*
2. Inclusion contrast	-0.11	-0.43**
3. Attachment anxiety	-0.02	-0.01
4. Attachment avoidance	-0.06*	-0.12**
5. Participant sex	0.56***	0.19
6. Attachment avoidance × ostracism contrast	—	0.08
7. Attachment avoidance × inclusion contrast	—	0.09
8. Attachment anxiety × ostracism contrast	—	0.01
9. Attachment anxiety × inclusion contrast	—	-0.04
10. Sex × ostracism contrast	—	0.44*
11. Sex × inclusion contrast	—	0.51**
R^2	.11***	.13***
ΔR^2		.02†
ΔR^2 due to attachment anxiety × observed experience		.002
ΔR^2 due to attachment avoidance × observed experience		.005

Note. Values for each predictor denote unstandardized regression coefficients. Participants' sex served as a covariate in step 1 and its interaction with observed experience was added as a covariate in step 2. Sex was coded so that male = 0 and female = 1. Impressions were scored such that higher scores indicate more positive impressions. † $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

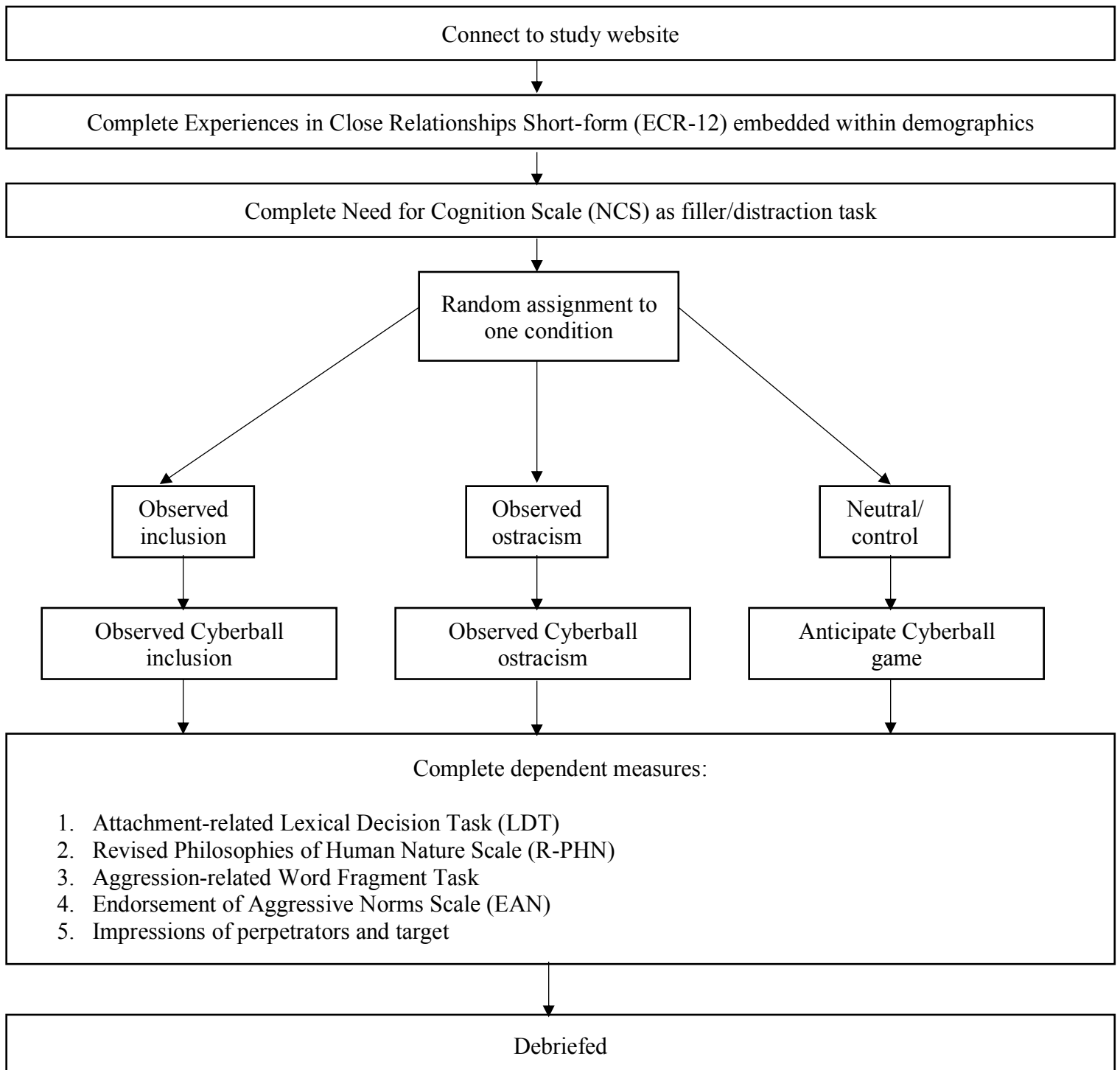


Figure 1. Schematic overview of the flow of participants through the procedure of the study.

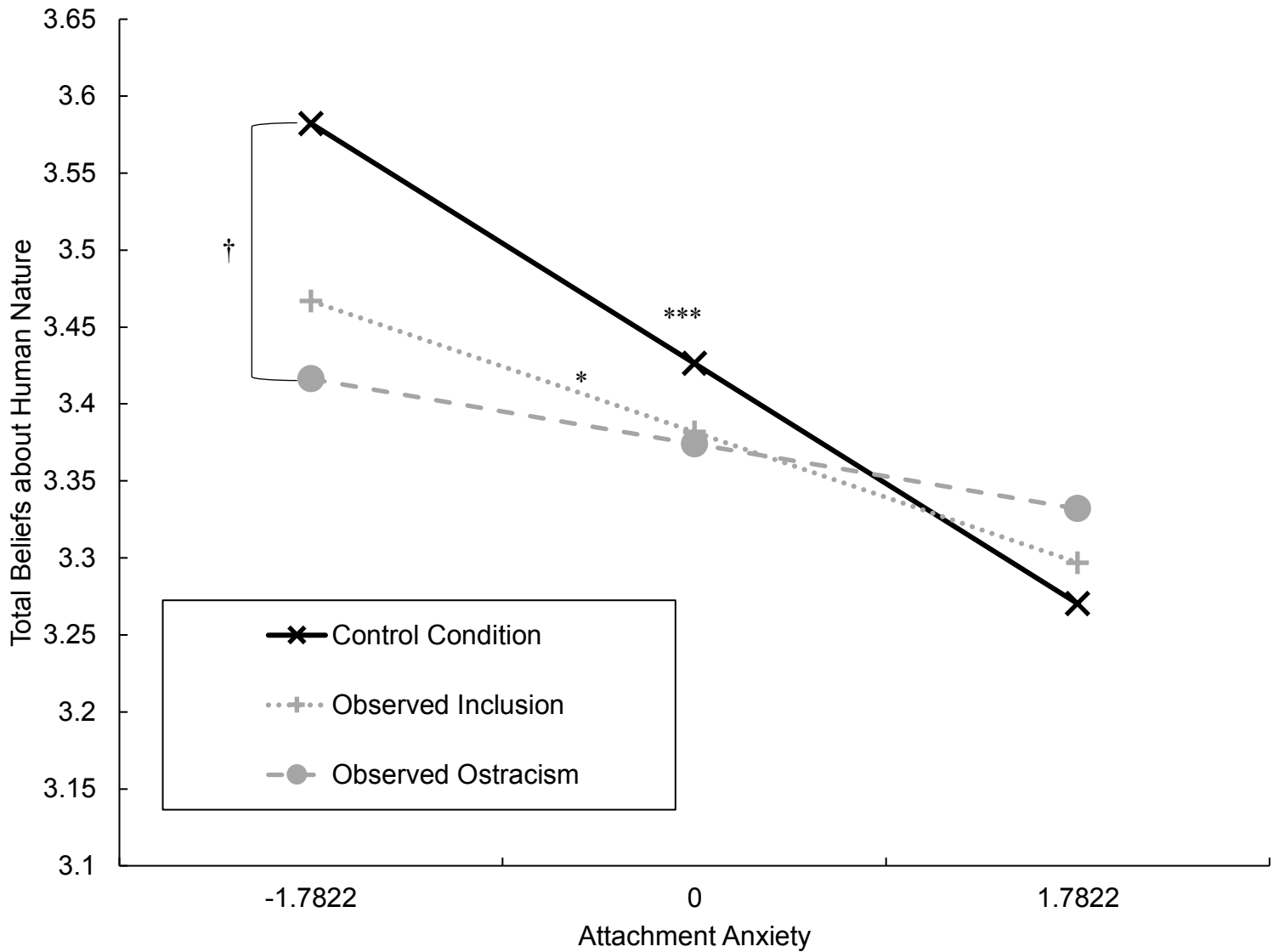


Figure 2. Interaction between participants' level of attachment anxiety and observed experience on their total beliefs about human nature. Beliefs about human nature were scored such that higher scores indicate more positive beliefs. † $p < .10$ * $p < .05$ *** $p < .001$

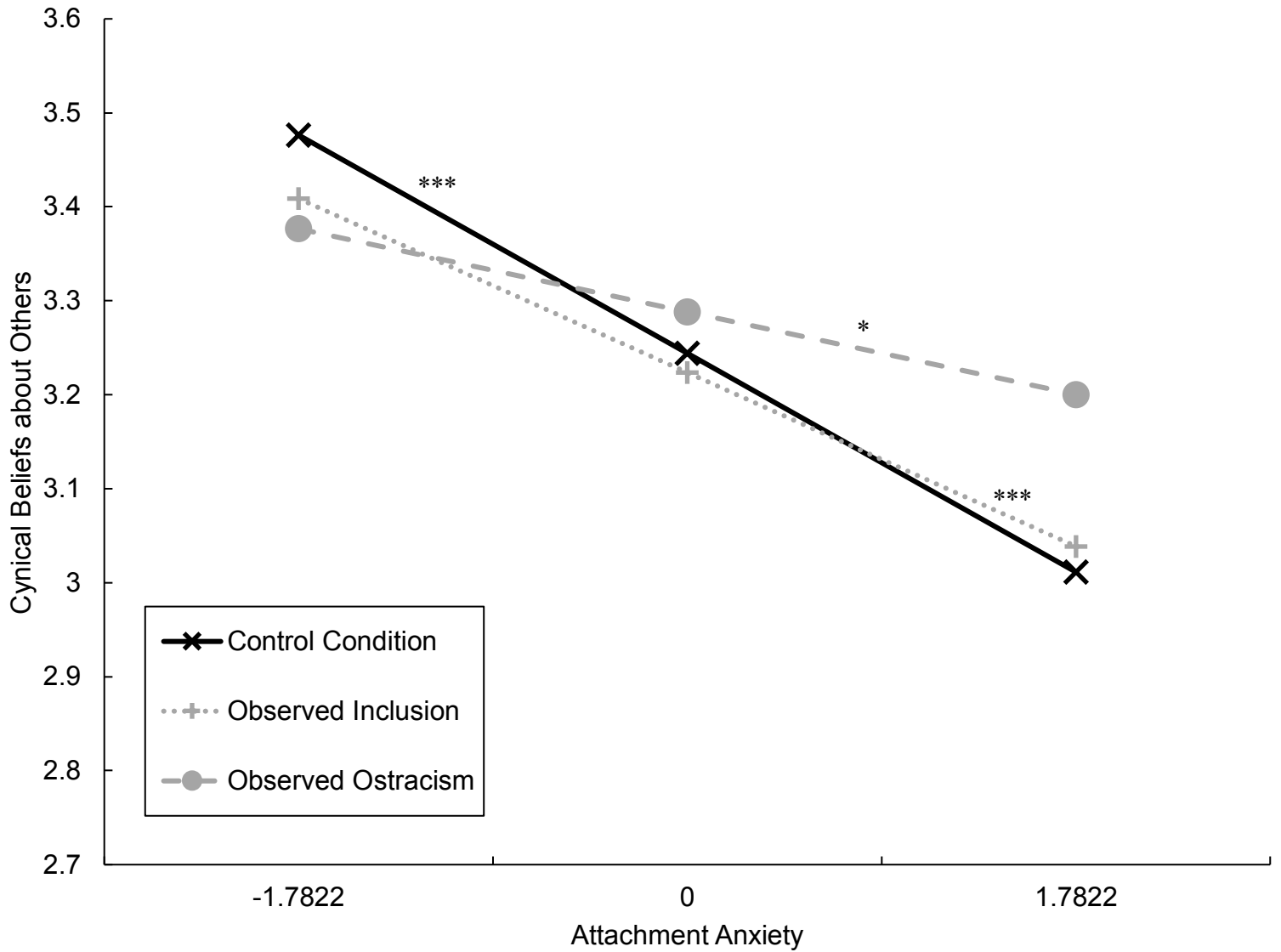


Figure 3. Interaction between participants' level of attachment anxiety and observed experience on their cynical beliefs about others. Cynical beliefs were scored such that higher scores indicate less cynical beliefs. * $p < .05$ *** $p < .001$

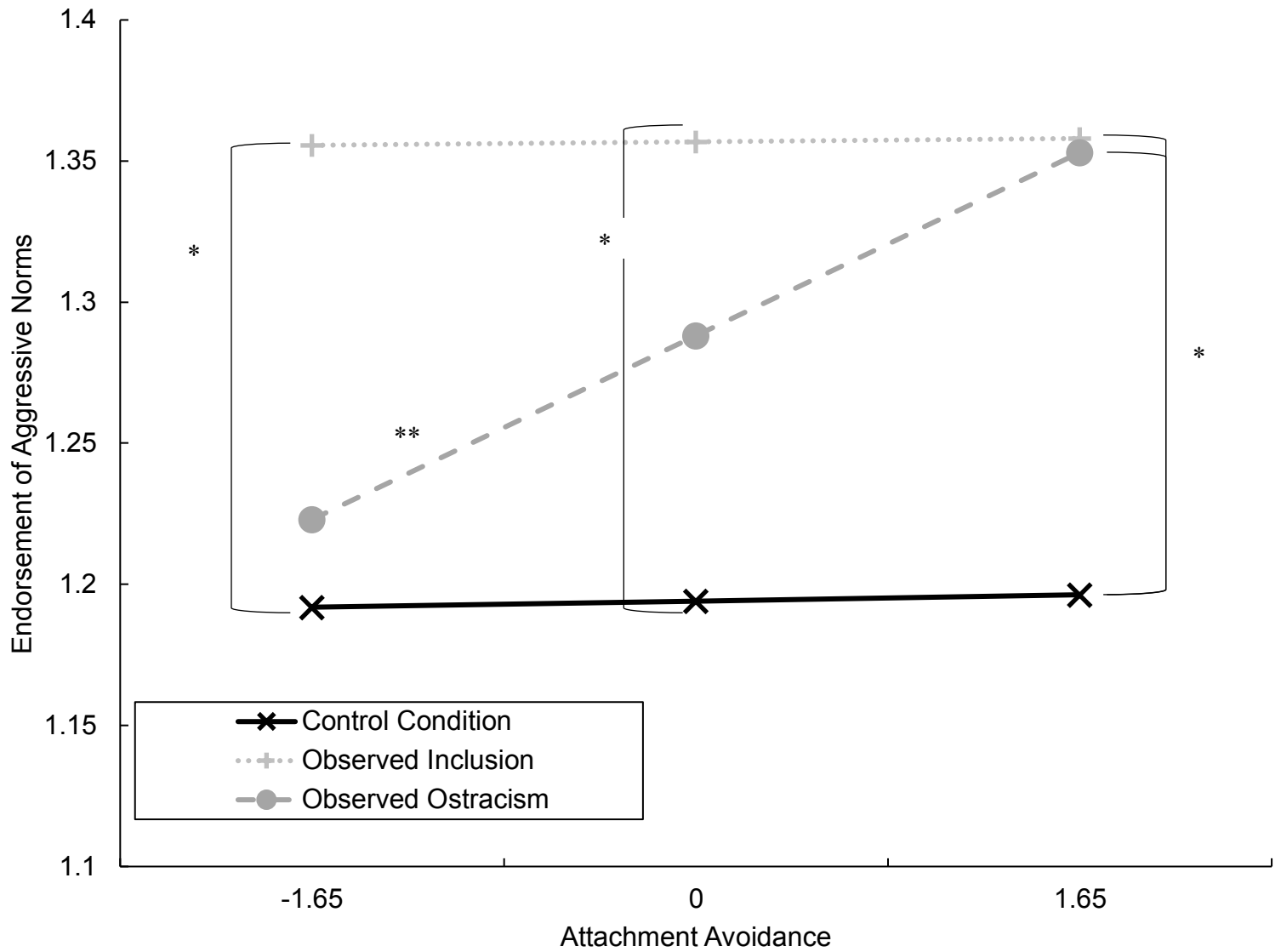


Figure 4. Interaction between participants' level of attachment avoidance and observed experience on their endorsement of pro-aggression norms. Endorsement of pro-aggression norms was scored such that higher scores reflect more endorsement. * $p < .05$ ** $p < .01$

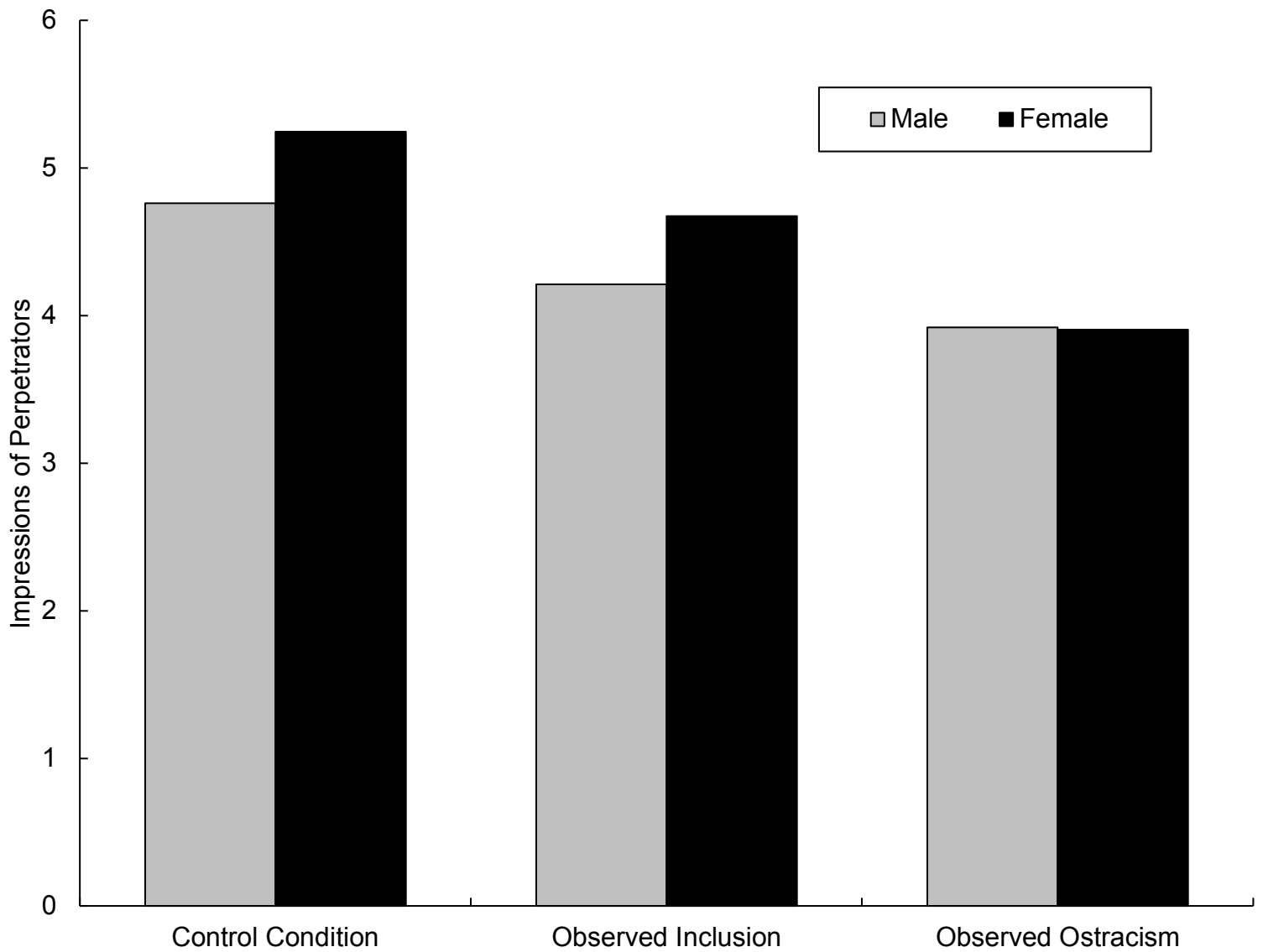


Figure 5. Interaction between participants' sex and observed experience on their impressions of the perpetrators. Impressions were scored such that higher scores indicate more positive impressions.

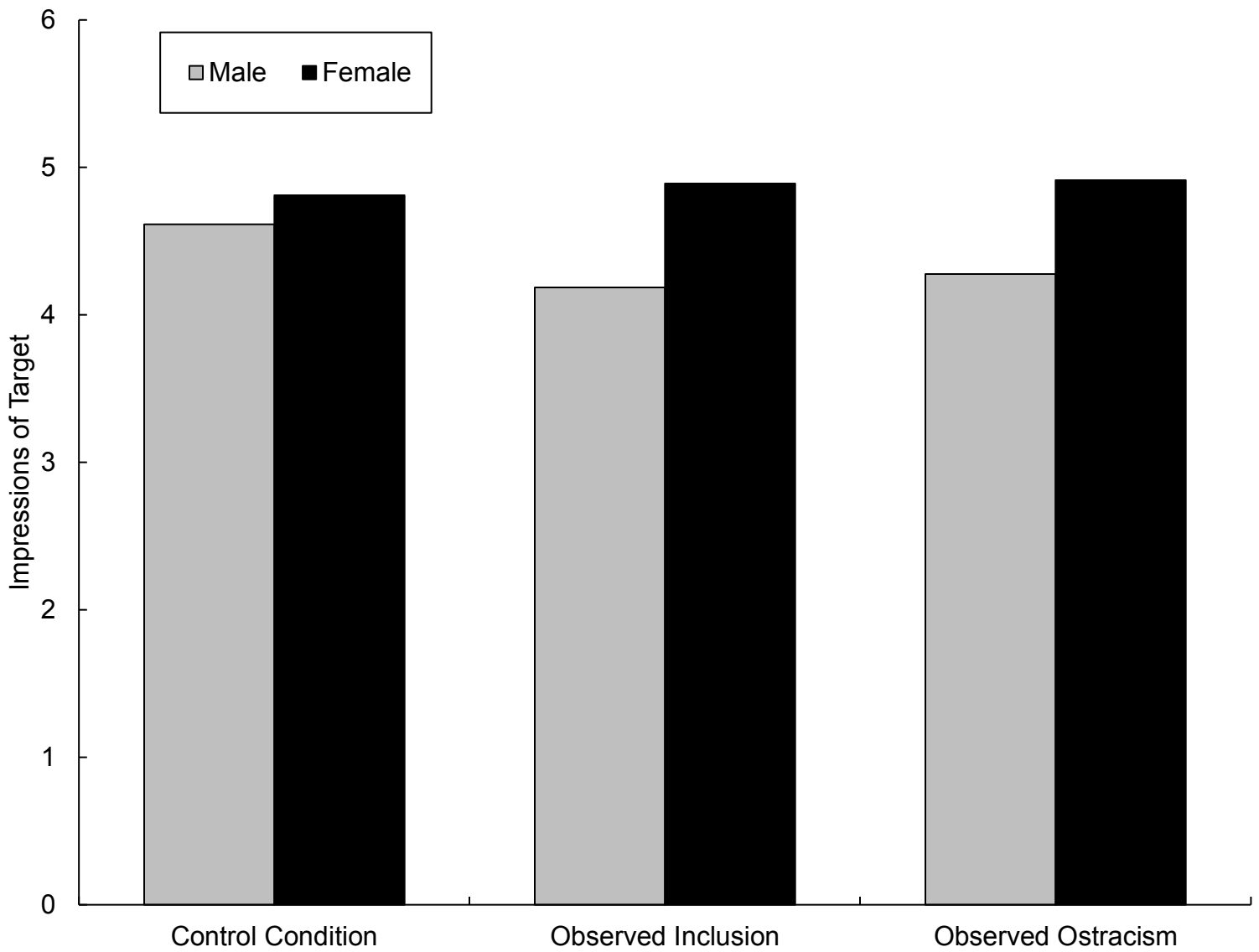


Figure 6. Interaction between participants' sex and observed experience on their impressions of the target. Impressions were scored such that higher scores indicate more positive impressions.

Appendix A

The Experiences in Close Relationships Short-form (ECR-12; Lafontaine et al., 2016)

The following statements concern how you generally feel in close relationships (e.g., with romantic partners, close friends, or family members). Respond to each statement by indicating how much you agree or disagree with it. Write the number in the space provided, using the following rating scale:

1	2	3	4	5	6	7	8	9
disagree strongly				neutral/ mixed				agree strongly

- ___ 1. I feel comfortable depending on others. (r)
- ___ 2. I worry that others won't care about me as much as I care about them.
- ___ 3. I usually discuss my problems and concerns with close others. (r)
- ___ 4. I worry a fair amount about losing my close relationship partners.
- ___ 5. I tell my close relationship partners just about everything. (r)
- ___ 6. I worry a lot about my relationships.
- ___ 7. I don't mind asking close others for comfort, advice, or help. (r)
- ___ 8. I worry about being alone.
- ___ 9. I don't feel comfortable opening up to others.
- ___ 10. I need a lot of reassurance that close relationship partners really care about me.
- ___ 11. I feel comfortable sharing my private thoughts and feelings with others. (r)
- ___ 12. If I can't get a relationship partner to show interest in me, I get upset or angry.

Note. Odd-numbered items correspond to the avoidance dimension. Even-numbered items correspond to the anxiety dimension. (r) denotes items that are reversed scored.

Appendix B

The 18-item Need for Cognition Scale (NCS; Cacioppo et al., 1984) to be used as a filler task.

For each statement below, please indicate whether or not the statement is characteristic of you or of what you believe. Please write the number in the space provided, using the following rating scale:

1	2	3	4	5
extremely uncharacteristic		uncertain		extremely characteristic

- ___ 1. I prefer complex to simple problems.
- ___ 2. I like to have the responsibility of handling a situation that requires a lot of thinking.
- ___ 3. Thinking is not my idea of fun. (r)
- ___ 4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. (r)
- ___ 5. I try to anticipate and avoid situations where there is likely chance I will think in depth about something. (r)
- ___ 6. I find satisfaction in deliberating hard and for long hours.
- ___ 7. I only think as hard as I have to. (r)
- ___ 8. I prefer to think about small daily projects to long term ones. (r)
- ___ 9. I like tasks that require little thought once I've learned them. (r)
- ___ 10. The idea of relying on thought to make my way to the top appeals to me.
- ___ 11. I really enjoy a task that involves coming up with new solutions to problems.
- ___ 12. Learning new ways to think doesn't excite me very much. (r)
- ___ 13. I prefer my life to be filled with puzzles I must solve.

___ 14. The notion of thinking abstractly is appealing me.

___ 15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

___ 16. I feel relieve rather than satisfaction after completing a task that requires a lot of mental effort. (r)

___ 17. It's enough for me that something gets the job done; I don't care how or why it works. (r)

___ 18. I usually end up deliberating about issues even when they do not affect me personally.

Note. (r) denotes items that are reversed scored.

Appendix C

Attachment-related and Neutral Words to be used in the Lexical Decision Task

(adapted from Edelstein & Gillath, 2008)

<i>Positive Attachment-related</i>	<i>Negative Attachment-related</i>	<i>Neutral</i>
Adore	Abandon	Average
Affection	Alone	Banner
Caring	Despair	Border
Comfort	Divorce	Combine
Depend	Hurt	Divide
Embrace	Insecure	Exact
Intimate	Lonely	Middle
Loving	Loss	Notice
Support	Reject	Permit
Trust	Sorrow	Quantity

Appendix D

Revised Philosophies of Human Nature Scale (R-PHN; Wrightsman, 1974; Wrightsman, 1992)

We now ask some general questions about your attitudes. For each of the statements below please indicate the extent to which you currently agree or disagree using the following scale:

1	2	3	4	5	6
disagree					agree
strongly					strongly

___ 1. If most people could get into a movie without paying and be sure that they would not be seen, they would do it. (c)

___ 2. Most people have the courage of their convictions. (b)

___ 3. The average person is conceited. (c)

___ 4. Most people try to apply the Golden Rule (i.e., treating others as one would wish to be treated), even in today's complex society. (b)

___ 5. Most people would stop and help a person whose car was disabled. (b)

___ 6. The typical student will cheat on a test when everybody else does, even though she/he has a set of ethical standards. (c)

___ 7. Most people do not hesitate to go out of their way to help someone in trouble. (b)

___ 8. Most people will tell a lie if they could gain by it. (c)

___ 9. It's pathetic to see an unselfish person in today's world, because so many people take advantage of her/him. (c)

___ 10. "Do unto others as you would have them do unto you" is a motto that most people follow. (b)

- ___ 11. People claim that they have ethical standards regarding honesty and morality, but few people stick to them when the chips are down. (c)
- ___ 12. Most people will speak out for what they believe in. (b)
- ___ 13. People pretend to care more about one another than they really do. (c)
- ___ 14. People usually tell the truth, even when they know they would be better off by lying. (b)
- ___ 15. Most people inwardly dislike putting themselves out to help other people. (c)
- ___ 16. Most people would cheat on their income tax if they had the chance. (c)
- ___ 17. The average person will stick to his opinion if he thinks he's right, even if others disagree.
(b)
- ___ 18. Most people will act as "Good Samaritans" if given the opportunity. (b)
- ___ 19. Most people are not really honest for a desirable reason; they're afraid of getting caught.
(c)
- ___ 20. The typical person is sincerely concerned about the problems of others. (b)

Note. (c) denotes items corresponding to the Cynicism subscale. (b) denotes items corresponding to the Belief that People are Conventionally Good subscale.

Appendix E

Sample Word Fragments to be used to Assess Aggressive Cognitions

(adapted from Carnagey & Anderson, 2005)

<i>Word Fragment</i>	<i>Neutral Completion</i>	<i>Aggressive Completion</i>
B_H_ _ _	Behind, Behave, Bahama, Behold, Behalf, Behest	Behead
IN_ _ RE	Insure	Injure
EX_ E_ _	Exceed, Expect, Extent, Extend, Except, Excess, Expert, Expend, Extern, Excels	None
MU_ _ ER	Mutter, Muster	Murder, Mugger
PR_ _ E	Pride, Prime, Prize, Prude, Prove, Price, Prune, Prose, Probe	None
SPEA_ _	Speak	Spear
FLI_ _ ER	Flipper, Flitter, Flicker, Flirter, Flivver	None
EXPL_ _ E	Explore	Explode
W_ _ M	Warm, Worm, Whim, Whom	Wham
KI_ _	Kite, Kiss, Kilt, King, Kids, Kind, Kiwi, Kink, Kilo	Kick, Kill

Note. Not all items were able to be completed as aggression-related words.

Note. (r) denotes items referring to relational aggression norms. (p) denotes items referring to physical aggression norms.

Appendix G

List of Trait Adjectives to be used in Impression Measure

<i>Positive Traits</i>	<i>Negative Traits</i>
Honest	Deceitful
Supportive	Rejecting
Helpful	Exploitative
Kind	Immoral
Good	Arrogant
Trustworthy	Hypocritical