

University of Nevada, Reno

**Contextual Behavioral Influences of Perceptions of Relationship Partners: An
Analogue Study**

A dissertation submitted in partial fulfillment of the requirements for the degree Doctor
of Philosophy in Psychology

by

Jordan T. Bonow

Dr. William C. Follette/Dissertation Advisor

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THE GRADUATE SCHOOL

We recommend that the dissertation
prepared under our supervision by

JORDAN T. BONOW

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Analogue Study**

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DOCTOR OF PHILOSOPHY

William C. Follette, Ph.D., Advisor

Anthony Papa, Ph.D., Committee Member

Deborah Davis, Ph.D., Committee Member

Alan E. Fruzzetti, Ph.D., Committee Member

Stephen L. Rock, Ph.D., Graduate School Representative

Marsha H. Read, Ph. D., Dean, Graduate School

August, 2013

Abstract

This dissertation tested a novel contextual behavioral model of factors influencing the accuracy of interpersonal perceptions in situations in which accuracy is vital (i.e., situations in which perceptions influence decisions regarding continued participation in a relationship). An analogue preparation was used to examine the effects of available information, learning history, and motivational variables on interpersonal perceptions. Results from 89 participants indicated that providing clear discriminative stimuli for the behavior of tacting interpersonal similarity significantly influenced perceived similarity. Results only partially supported a proposed model of interpersonal perception that predicted that particular learning histories supporting biased forms of perception and variables increasing motivation to perceive others in a biased manner would interact to significantly decrease accuracy of interpersonal perceptions. It is hoped that the proposed research will serve as a foundation for a progressive, fruitful program of basic and applied research based on a contextual behavioral approach to interpersonal perception specifically and judgment and decision making more generally.

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Contextual Behavioral Influences of Perceptions of Relationship Partners: An Analogue Study

It is popularly assumed that accurate understanding of one's romantic partner (e.g., of his or her thoughts, feelings, motives, attitudes, and values) is essential for relationship satisfaction and success. Discussion in the scientific literature, however, suggests that there is a complex relationship between accuracy of one's understanding of his or her partner and relationship satisfaction and success. While research has consistently revealed a positive correlation between partner understanding and relationship satisfaction and success (Sillars, 1985), it has also been proposed that inaccurate perceptions can actually be of benefit to relationships.

Sillars (1985; as cited by Ickes & Simpson, 1997; p. 224) suggested that inaccurate understanding of one's relationship partner can have a positive impact on a relationship in a number of circumstances. These include situations in which: (1) irreconcilable differences exist between partners, (2) partners directly express unpleasant assessments of each other, and (3) benevolent misconceptions of a partner create relationship stability and satisfaction. Ickes and Simpson (1997) summarize these as situations in which "accuracy leads to insights that are not only painful and distressing to one or both partners, but also raise doubts about the strength and permanence of their relationship" (p. 224). In such a conceptualization, inaccurate perceptions primarily function to protect a relationship partner or the relationship as a whole. Murray, Holmes, and Griffin (1996a, 1996b) provide evidence that inaccurate perceptions can also have generative effects. They found that relationship partners often idealize each other (i.e., perceive each other as more ideal than is actually the case), which contributes to

relationship satisfaction (Murray et al., 1996a). Moreover, through self-fulfilling processes, such idealization of relationship partners can actually contribute to changes that approximate the ideal relationship (Murray et al., 1996b). Overall, the literature suggests that there is evidence that inaccurate partner perceptions are beneficial to relationships, contributing to both short-term satisfaction and long-term longevity (Gagne & Lydon, 2004).

In contrast, and in line with popular thought, there is a body of evidence suggesting that accurate partner perceptions are also beneficial to relationships (Sillars, 1985; Gagne & Lydon, 2004). It seems particularly important for relationship partners to have accurate understandings of each other when making important life decisions (Gagne & Lydon, 2004). In addition, as implied by Levinger and Breedlove (1966), partner's understanding of each other may be most important when it has instrumental and practical implications (e.g., role performance, the importance of specific communication topics). For example, in order to avoid conflict and achieve parenting goals, partners need to be aware of each other's attitudes about parenting that will impact everyday interactions with their children.

In reaction to these seemingly contradictory benefits of both accuracy and inaccuracy in partner perceptions, Gagne and Lydon (2004) suggest that accuracy and inaccuracy can each be beneficial depending on the context. They demonstrated that accurate perceptions of the quality of the relationship are beneficial during deliberative activities (e.g., when deciding whether to remain in a relationship) because they allow for effective decision-making. However, inaccurate perceptions of the quality of the relationship may be beneficial during instrumental activities (e.g., when determining

strategies for achieving mutual goals) because they increase partner involvement in the pursuit of relationship goals. Thus, the importance of accuracy in partner perceptions is dependent upon the specific context in which perceptions are made.

Gill and Swann's (2004) concept of *pragmatic accuracy*, accuracy in perceptions of relationship partners that facilitates the achievement of relationship specific goals, similarly emphasizes the role context plays in the importance of accuracy in partner perceptions. Within this conceptualization, accuracy is only important with regard to predictions that will facilitate successful interaction with a relationship partner. For example, an individual likely does not need to accurately assess a partner's specific work-related skills in order to interact with him or her effectively, so that individual will likely not have an accurate perception of his or her partner's skill set in that domain. In contrast, it may be very important for an individual to understand his or her partner's beliefs about managing finances when discussing a household budget; this would increase the likelihood that that individual would accurately perceive his or her partner's beliefs in this domain. Research has supported the notion of pragmatic accuracy. Gill and Swann (2004) found that individuals were better able to predict their romantic partners' self-perceptions about relationship-relevant traits than about traits less relevant to relationships. Moreover, this pragmatic accuracy in predicting relationship-relevant traits was found to uniquely predict relationship harmony (Gill & Swann, 2004).

In summary, the context in which partner perceptions are made determines the importance of the accuracy of those perceptions. The present research is concerned with those circumstances in which accuracy of partner perceptions is essential (i.e., situations in which perceptual inaccuracies lead to dysfunction and poor outcomes). Specific

consideration is given to two such circumstances. In the first, the inaccurately perceived incompatibility of values and attitudes could lead to the unnecessary dissolution of a relationship. In the second, the inaccurately perceived compatibility of values and attitudes could lead to eventual conflict.

As an example of the possible outcomes of these circumstances, consider romantic partners who only minimally explore the compatibility of their values and attitudes (e.g., those related to child-rearing) in the early stages of the relationship. When romantic partners actually have compatible values, failure to clearly identify this may result in one partner perceiving the other as an incompatible relationship partner (e.g., perceives that the partner will have a conflicting parenting style in the future). This perceived incompatibility may contribute to general relationship dissatisfaction. Moreover, when this perceived incompatibility is viewed as unacceptable to the partner perceiving it (i.e., he or she is unwilling to compromise his or her own values and attitudes), this can easily result in the dissolution of the relationship.

In contrast, when romantic partners have differing values and attitudes that clearly imply incompatible courses of action (e.g., when engaging in parenting) and these differences are not revealed prior to the contacting of situations in which they are instrumentally relevant (e.g., the birth of a child), relationship dissatisfaction and conflict result. When a practical compromise cannot be reached between partners (i.e., there are irreconcilable differences),¹ relationship dissolution and all of its negative effects are likely. This is especially the case when it is revealed that a partner's values and attitudes

¹ See Davis and Rusbult (2001) for a discussion of *attitude alignment*, the process in which relationship partners modify their own attitudes in order to achieve compatibility.

are widely different than had been perceived by the other partner (possibly for many years), often leading to statements to the effect of, “he/she is not the person with whom I fell in love.” While it is the case that values and attitudes of relationship partners can change over the course of time, it is proposed that such conflicts in long-term relationships can actually result from biased perceptual processes early in relationships.

Overall, while it is possible for the first circumstance (inaccurately perceived incompatibility) to occur, the literature has focused on the more common second circumstance (inaccurately perceived compatibility). One possible source of inaccurately perceived compatibility of partner values and attitudes identified in the literature is the perception that one’s partner actually shares one’s own values and attitudes. In the field of social psychology, it has long been noted that people’s perceptions and predictions of the behavior and attitudes of others are positively correlated with their reports of their own behaviors and attitudes, indicating that people may unduly perceive others as similar to themselves (Hoch, 1987). While most commonly referred to as *projection*, this perceptual tendency has at various times been labeled attributive projection, assumed similarity, egocentric attribution, lack of empathy, and false consensus (Hoch, 1987; p. 221).

The occurrence of projection in interpersonal perception has been documented in a number of different contexts. For example, when considering whether a marriage partner would like a new product, a partner’s predictions were biased toward his or her own preferences (Davis, Hoch, & Ragsdale, 1986), suggesting that partners projected their preferences onto each other. In addition, assumed similarity in married couples’ attitudes toward family life is significantly greater than their actual agreement (Levinger

& Breedlove, 1966), indicating that marriage partner's project their own attitudes onto each other. Moreover, Schul and Vinokur (2000) demonstrated that projection occurs when spouses report affective states, attitudes, and behaviors of their partners. Furthermore, Kenny and Acitelli (2001) found assumed similarity (i.e., projection) in an individual's perceptions of a romantic partner's feelings of closeness, feelings of caring, equity, sexual enjoyment, and job satisfaction. Finally, empirical research by Mikulincer and Horesh (1999) documented projection of self-traits by individuals forming impressions of and making memory inferences about fictional strangers.

There are a number of potential explanations of projection in interpersonal perceptions. Like other phenomena of social perception, projection can generally be explained as resulting from either cognitive or motivational processes (Tetlock & Levi, 1982; Kenny & Acitelli, 2001). From a cognitive perspective, individuals are attempting to be as accurate as possible (Tetlock & Levi, 1982; Kenny & Acitelli, 2001). Thus, projection occurs when an individual is uncertain about another person's views (Kenny & Acitelli, 2001), and resulting perceptual inaccuracies are likely caused by an individual following faulty inference strategies or relying on inaccurate information (Tetlock & Levi, 1982).

Judgment and decision making research on anchoring provides some insight regarding the cognitive processes that underlie projection. Anchoring was popularized by the work of Tversky and Kahneman (1974), which identified it as one of three heuristics commonly used in making judgments under conditions of uncertainty (Chapman & Johnson, 2002). In the current literature on judgment and decision making, *anchoring* refers to the phenomenon in which an initial estimate, whether self-generated or planted

(e.g., via an experimental manipulation) and regardless of its meaningfulness (i.e., whether it is randomly generated or purported to actually be related to the current judgment being made), excessively influences a final judgment. A review by Furnham and Boo (2011) reveals that anchoring under conditions of uncertainty has been documented in a wide variety of domains involving judgment and decision making, including: answering general knowledge questions, making probability estimates, providing legal rulings, making purchasing decisions, and negotiating business deals.

Anchoring also appears to underlie clinically relevant phenomena such as comparative ability judgments (e.g., the “above-average” and “below-average” effects; Kruger, 1999), aspects of social anxiety (e.g., the illusion of transparency, the spotlight effect; Gilovich & Savitsky, 1999), and overestimation of one’s effectiveness in communication (e.g., Keysar & Henly, 2002; Fay, Page, Serfaty, Tai, & Winkler, 2008). Moreover, Epley, Keysar, Van Boven, and Gilovich (2004) demonstrated that the more general perspective taking process involved in all of these phenomena involves anchoring; when taking the perspective of others, an individual use his or her own abilities and experience as an anchor of his or her perception. This analysis is applicable to the phenomenon of projection; when an individual perceives others under conditions of uncertainty, he or she uses his or her own thoughts, feelings, attitudes, and values as an anchor.

Current explanations of anchoring focus on two separate processes: (1) selective accessibility of anchor-consistent information and (2) insufficient adjustment from anchors (Simmons, LeBoeuf, & Nelson, 2010). Selective accessibility processes are said to contribute to anchoring when semantic priming activates information consistent with

the anchor, increasing the amount of evidence supporting the plausibility of the anchor as the correct estimate (see e.g., Strack & Mussweiler, 1997; Mussweiler & Strack, 1999). Insufficient adjustment occurs when individuals are not sufficiently motivated to make an adjustment, are uncertain of the direction in which to adjust the anchor value, or other factors (e.g., cognitive load) prevent adjustment (Simmons et al., 2010; Epley & Gilovich, 2006).

There is some evidence that, as proposed by a cognitive explanation, projection is an adaptive phenomenon that results from attempts at accurately perceiving or making predictions about others. For example, Schul and Vinokur (2000) found that degree of projection was positively correlated with degree of similarity between relationship partners. In addition, romantic partners project less when there are clear differences between themselves and their partner in a specific domain interest (e.g., partners project less when predicting partner job satisfaction than when predicting sexual enjoyment; Kenny & Acitelli, 2001). Finally, providing specific feedback regarding partner product preferences reduced the amount of projection in subsequent preference predictions (Lerouge & Warlop, 2006). All of these results suggest that projection is attenuated by its utility.²

Despite these findings, there is considerable evidence that individuals' engagement in projection actually reduces the accuracy of their perceptions (see the above discussion of Murray et al., 1996a, 1996b). From a motivational or functional

² It is interesting to note that Hoch (1987) provides evidence that romantic partners could improve the accuracy of their predictions about partners if they projected more. Hoch notes that this improved accuracy with increased projection only occurs because individuals are unable to evaluate other pieces of information that may actually be more useful when attempting to make accurate predictions. Thus, while projection could relatively improve accuracy, extreme levels of projection would typically result in important misperceptions.

perspective, there are many factors beyond a desire for accuracy influencing an individual's interpersonal perceptions (Tetlock & Levi, 1982; Kenny & Acitelli, 2001). Perceptual inaccuracies, including those involving projection, can be caused by factors such as "the need for self-esteem, the need for social approval, the need to believe in a 'just world,' and the need for effective control" (Tetlock & Levi, 1982; p. 75).

Ickes and Simpson (1997) provide one specific model of conditions promoting inaccuracy of interpersonal perceptions (including those involving projection). According to this model, inaccurate perceptions are most likely to occur when one's relationship partner has thoughts and feelings that would be distressing to hear, those thoughts and feelings are expressed unambiguously, and one feels threatened by the expression of those thoughts and feelings (p. 236). Following from such an approach, dysfunctional forms of projection in social perceptions are particularly likely to occur when one is avoiding perceptions of differences from a relationship partner that are particularly aversive (Kenny & Acitelli, 2001; see also the above discussion of Sillars, 1985, and Ickes & Simpson, 1997).

There is some evidence that avoidance of aversive perceptions reduces accuracy of interpersonal perceptions. An experiment by Simpson, Ickes, and Blackstone (1995) demonstrated that relationship partners in a situation highly threatening to their relationship (i.e., evaluating highly attractive opposite-sex individuals in each other's presence) were less likely to accurately infer each other's thoughts and feelings during the task than relationship partners in a less threatening situation. In addition, Knudson, Summers, and Golding (1980) found that married couples who resolved conflict with avoidance (e.g., changing topics) showed decreases in understanding in each other's

interpersonal perceptions whereas couples who resolved conflict in a more direct manner (e.g., openly discussing their views) showed increases in understanding of each other's interpersonal perceptions. While these two studies do not directly demonstrate that projection results from avoidance of aversive perceptions, they provide evidence for motivational factors influencing perceptual processes in ways that could lead to the occurrence of dysfunctional forms of projection. More specifically, they suggest that avoidance of aversive perceptions results in uncertainty about one's partner's thoughts, feelings, attitudes, and values, making it more likely that that partner will be unduly perceived as similar to oneself.

Historically, cognitive and motivational explanations of inaccurate interpersonal perceptions were viewed as competing theories (Tetlock & Levi, 1982). However, because of difficulty in generating critical tests, Tetlock and Levi (1982) argued that the cognitive and motivational explanations are more usefully viewed as complementary approaches that should both continue to be refined and pursued empirically. Kenny and Acitelli (2001) provide an example of such a dual approach, arguing that their results reflect both cognitive and motivational influences on interpersonal perceptions. Overall, it is currently concluded that various motivations (e.g., accuracy, self-protection) activate different cognitive processes, which can lead to more or less accurate perceptions (Kunda, 1990).

Adult attachment theory (e.g., Mikulincer & Shaver, 2007) provides a more specific and comprehensive model of the possible cognitive and motivational sources of inaccurate interpersonal perceptions. According to this model, in contrast to individuals with secure attachment styles who generally perceive others in an accurate manner,

individuals with insecure attachment styles misperceive others in characteristic ways that meet their interpersonal goals. Individuals with an anxious attachment style generally pursue goals involving receiving support and security from others, and individuals with an avoidant attachment style generally pursue goals involving self-reliance and avoidance of intimacy (for further discussion of attachment style and interpersonal goals, see Mikulincer & Shaver, 2007; p. 256-258). Thus, attachment-avoidant individuals are motivated to perceive themselves as unique and separate from others and to engage in “defensive projection,” the suppression of negative self-aspects by attributing them to others (Freud 1915/1957; as cited by Mikulincer & Shaver, 2007; p. 185; see also Mikulincer & Horesh, 1999).³ In contrast, attachment-anxious individuals are motivated to perceive themselves as similar and connected to others and to engage in “projective identification,” the “projection of self-traits as a means of blurring self-other boundaries and defending against threats of distinctness, separation, and loss” (Klein, 1940; as cited by Mikulincer & Shaver, 2007; p. 185; see also Mikulincer & Horesh, 1999).

The work of Mikulincer and colleagues (Mikulincer, Orbach, & Iavnieli, 1998; Mikulincer & Horesh, 1999) provides empirical support for this attachment-focused model of interpersonal perception. Their results demonstrated that attachment-anxious individuals overestimated similarities between themselves and others as well as projected their own positively-evaluated traits onto others. Moreover, their results demonstrated that individuals with an avoidant attachment style underestimated similarities between themselves and others as well as projected negatively-evaluated traits onto others.

³ Note that, while this phenomenon is also labeled as a form of “projection,” it actually involves the excessive perceived dissimilarity. Thus, it is the opposite of “projection” as defined above. Unless specifically noted, the use of the word “projection” in this proposal will continue to refer to perceived similarity.

Adult attachment theory suggests that these processes should be moderated by the presence (or lack) of threat or distress (Mikulincer et al., 1998). According to Mikulincer and Shaver's (2007; p. 31) general model of attachment-system activation and functioning, perceived threat or distress can result in the activation of the secondary attachment systems of individuals with insecure attachment styles. The secondary attachment system of individuals with an avoidant attachment style involves deactivating strategies that include attempts to increase distance from others (Mikulincer et al., 1998; Mikulincer & Shaver, 2007). Thus, perceived threat or distress should exacerbate attachment-avoidant individuals' tendencies to perceive others as different while perceived security should mitigate it. The secondary attachment system of individuals with an anxious attachment style involves hyperactivating strategies that include increased vigilance regarding threat- and attachment-related cues. This results in their increased attention on and experience of aversive events, which in turn increases motivation to perceive others as similar. Thus, perceived threat or distress should exacerbate attachment-anxious individuals' tendencies to perceive others as similar while perceived security should mitigate it.⁴ Results of empirical work by Mikulincer and colleagues (1998) supported these predictions when threat and security were manipulated using affect induction (e.g., watching a brief movie) or distress arousal (e.g., thinking about a previous relationship and interactions with that partner). Overall, adult

⁴ See Mikulincer and Horesh (1999) for a possible alternative, cognitive account of projection in individuals with an anxious attachment style. The authors suggest that projection could potentially be the result of individuals with an anxious attachment style chronically attending to their own traits, making them more accessible (and thus more likely to influence the outcome of) when they attempt to label the traits of others.

attachment theory has provided a useful model of the possible sources of inaccurate interpersonal perceptions.

An alternative conceptualization of the possible sources of inaccurate interpersonal perceptions can be generated using a contextual behavioral approach. Fantino and colleagues (e.g., Fantino, 2004; Fantino & Stolarz-Fantino, 2005) have argued that such an approach can make significant contributions to the study of judgment and decision-making. For example, it provides novel explanations of irrational processes such as base-rate neglect and the sunk-cost effect (see Fantino, 2004, for a review). According to a contextual behavioral approach, perceiving and labeling the thoughts, feelings, attitudes, and values of other individuals are simply behaviors under the control of the same processes influencing other behaviors (broadly the interaction between the learning history of an individual and the current environment). Thus, terms such as “defensive projection” and “projective identification” are simply descriptions (rather than explanations) of perceptual and labeling behaviors of an individual. Moreover, the cognitive and motivational underpinnings of inaccurate interpersonal perception can be reinterpreted using behavioral principles. At the most foundational level projection occurs because it is functional for a person to engage those behaviors (i.e., the behaviors involved have been reinforced in the past under similar circumstances).

When an individual makes and reports interpersonal perceptions, he or she is typically thought of as engaging in the behavior of “tacting.” In technical terms, tacting occurs when the content of a statement is under the appropriate discriminative control of the environment and the behavior of making the statement is reinforced when the speaker’s verbal community (which can be limited to him- or herself acting as a listener)

understands the statement (Skinner, 1957). In more colloquial terms, tacting can be understood as the behavior of stating facts. Thus, when an individual makes and reports interpersonal perceptions, he or she is presumably attempting to accurately label the thoughts, feelings, attitudes, and values of other individuals. This is the same assumption underlying the cognitive explanations of projection.

Instead of focusing on cognitive processes (which primarily describe rather than explain behavior that is occurring), though, a contextual behavioral approach to inaccurate interpersonal perceptions attempts to identify the learning history of an organism that interacts with current situational factors in a manner that leads to inaccurate labeling. It is relatively easy to imagine circumstances in which one's history and current environment lead to inaccurate interpersonal perceptions. Individuals typically contact environments that prompt and reinforce the behavior of labeling (whether accurate or not) the thoughts, feelings, attitudes, and values of themselves and others. In some cases, individuals tact private behaviors and events (i.e., information that is generally only available to him- or herself such as the content of thoughts or bodily sensations). In other cases, individuals tact overt behaviors and events (i.e., information that is readily available to an outside observer). Accurately tacting one's own thoughts, feelings, attitudes, and values is significantly easier than accurately tacting the thoughts, feelings, attitudes, and values of others because of the accessibility of the behaviors one is attempting to label. This is especially the case when one additionally has a limited or no history of observing the behavior of the person who is being perceived.

At the simplest level, then, inaccurate interpersonal perception is most likely to occur when an individual attempts to label thoughts, feelings, attitudes, and values to

which he or she has no access (currently or historically). The result is that he or she makes statements that are controlled by the environment to which he or she does have access (i.e., his or her own private experiences). In other words, an individual makes judgments of others that rely on his or her own thoughts, feelings, attitudes, and values. In more technical terms, this inaccurate interpersonal perception is primarily the result of inappropriate stimulus control (see Dinsmoor 1995a, 1995b, for a discussion of stimulus control). An individual's own private experiences function as discriminative stimuli for the verbal response he or she makes when asked to report his or her perceptions of others. This process can be very functional when the perceiver and the perceived are fortuitously very similar (i.e., labels of one's own thoughts, feelings, attitudes, and behaviors are applicable to the perceived individual). However, when there are differences between the perceived and the perceiver, this behavior can be very dysfunctional. In either case, though, inappropriate stimulus control is present because an individual's behavior is not under the control of actual external stimuli (i.e., the thoughts, feelings, attitudes, and values of the perceived individual).

In contrast, perceived similarity resulting from a history suggesting actual similarities between the perceiver and the perceived can be understood as the result of appropriate stimulus control. From the perspective of the perceiver, in such cases the "I" is like the "other." Therefore, it is functional for that perceiver to behave with respect to another person as he or she would behave with respect to his- or herself. According to Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001), a contextual behavioral approach to language and cognition, the "I" and the "other" can become functionally equivalent through a direct or indirect learning history reinforcing

responding that equates the two. In an RFT account of this process, the “I” and the “other” are said to be in a frame of coordination with each other.⁵ When this frame reflects actual similarities between the two individuals, it can be used to generate accurate descriptions of the “other.”

While frames of coordination can lead to accurate perceptions of others, there are circumstances in which they can lead to inaccurate perceptions. This occurs when the framing of coordination of the “I” and the “other” is not the result of a sufficient learning history. Such relational framing can occur without a direct learning history (e.g., when an individual is told that he is similar to another individual by a mutual friend even though he is not, when one generalizes from a small number similarities to many unrelated domains). Dysfunctional forms of framing are likely to occur when one is very motivated to perceive the “I” and the “other” as similar. For example, it may be reinforcing to perceive oneself as similar to another individual who is “good” or otherwise positively evaluated (in effect framing oneself as “good” in addition to being similar to the other individual).⁶

Before further discussing ways in which motivational factors fit into a contextual behavioral approach to projection, there is an important point to be clarified. While an RFT account is very similar to other cognitive explanations of projection, there is a clear difference in emphasis. Relational framing is viewed as a type of operant behavior

⁵ A simpler account of stimulus equivalence (see e.g., Sidman, 1994) also provides an explanation for behaving with respect to the “other” in a way that is similar to behaving with respect to the “I.” An RFT account is presented here, as it generally subsumes a stimulus equivalence explanation while providing a comprehensive account of the development of stimulus equivalence in the absence of a direct learning history.

⁶ The opposite is also possible, as person may be motivated to perceive the “I” and the “other” as dissimilar for a number of reasons (e.g., to separate oneself from a “bad” person, to reduce feelings of closeness).

(Hayes et al., 2001). This means that it is subject to the processes controlling other behaviors (e.g., stimulus control, reinforcement). It also means that it cannot be used in isolation to functionally explain other behaviors. Identifying a behavior occurring earlier in a chain of behaviors does not serve as an explanation for later behaviors; a more appropriate explanation is the identification of the interaction between the learning history of an individual and his or her environment (For a discussion of the inadequacy of behavior-behavior relations as explanations see Hayes & Brownstein, 1986).

Emphasizing the interaction between learning history and current environment provides a useful framework for understanding the ways in which motivational factors contribute to inaccurate interpersonal perceptions. Motivational explanations of biased perceptions focus on the functions of those biases. This is clearly in concert with the contextual behavioral approach. For example, inaccurate perceptions serving to avoid conflict and other aversive experiences (e.g., inaccurately perceiving an attractive other as compatible with oneself) can be understood as being maintained by processes of negative reinforcement. The causes of inaccurate interpersonal perceptions proposed by the motivational explanations of other theoretical approaches can thus be incorporated into a contextual behavioral approach, resulting in the development of a specific contextual behavioral model of interpersonal perception.

It is again important to emphasize that a contextual behavioral approach focuses on the interaction between an individual's learning history and his or her current environment. As a result, some of the constructs used in the motivational explanations of other theoretical approaches are not directly transferable to a contextual behavioral model. For example, the various needs (e.g., for self-esteem, for effective control) that

Tetlock and Levi (1982) suggest that perceptual biases are instead understood in terms of consequences that function as reinforcers for the behavior of a particular individual. Moreover, from a contextual behavioral perspective, attachment style (see Mikulincer et al., 1998; Mikulincer & Horesh, 1999; Mikulincer & Shaver, 2007) can be interpreted as a label for a pattern of behaviors that result from a particular social learning history, especially as it interacts with current environmental events (Mansfield & Cordova, 2007). Thus, the explanations of inaccurate interpersonal perceptions are removed from internal mechanisms and placed in the realm of manipulable environmental events.

The identification of causes of inaccurate interpersonal perceptions in the realm of manipulable events is the primary strength of taking a contextual behavioral approach to interpersonal perception. The present research was intended to identify factors influencing accuracy of interpersonal perceptions. It is hoped that the present research will serve as a first step in a program of research that identifies contextual manipulations or new learning histories that can be provided to individuals in order to protect them from making interpersonal perceptual errors that may have deleterious long-term effects.

The present research is based on a specific contextual behavioral model of two closely-related possible causes of inaccurate interpersonal perceptions: (1) history of reinforcement for perceiving others in a biased manner and (2) situation-specific motivation to perceive others in a biased manner. As stated above, as a result of previous learning history and current environmental factors, individuals typically attempt to accurately perceive and label the thoughts, feelings, attitudes, and values of others. This is because accurate labeling allows one to orient to his or her environment in a manner

that maximizes his or her access to positive reinforcement (e.g., by cultivating relationships with individuals with shared attitudes and values, by allowing one to make accurate predictions of the behaviors of others).

In some contexts, however, the perceptual and labeling behaviors of an individual are influenced by additional factors. In some cases individuals have a learning history that has reinforced perceiving others as dissimilar, and thus they are likely to emit this form of behavior when asked to perceive others. In other cases individuals have a learning history that reinforced perceiving others as similar, and thus they are likely to emit this form of behavior when asked to perceive others. As suggested by the above discussion of attachment styles, these are the types of learning histories and behavioral tendencies that appears to be common in individuals who are described as having an avoidant and anxious attachment styles, respectively.

In addition to this, the perceptual behaviors commonly emitted by individuals are even more likely to be emitted under the specific conditions (technically referred to as establishing or motivating operations; Michael, 1982; Laraway, Scycerski, Michael, & Poling, 2003) in which the reinforcing consequence maintaining that behavior has been even more effective as a reinforcer. In terms of attachment theory, these are the exact conditions present when an individual described as having an insecure attachment style contacts a threat that activates a characteristic secondary attachment system (see Mikulincer & Shaver, 2007; see also Mansfield & Cordova, 2007). These aversive experiences set the occasion for the emission of behaviors that function to escape or avoid that experience. As suggested above, inaccurate perception is one such functional behavior. Individuals described as attachment-avoidant are typically reinforced for

perceiving others as different, and they are especially likely to engage in that type of perceptual behavior when it attenuates an aversive private experience. Similarly, individuals described as attachment-anxious are typically reinforced for perceiving others as similar, and they are especially likely to engage in that type of perceptual behavior when it attenuates an aversive private experience.

From a contextual behavioral perspective, inaccurate perceptual behaviors having these functions are much more likely to occur when an individual typically exhibits patterns of dysfunctional responding to aversive stimulation. One popular and well-formulated description of dysfunctional responding to aversive stimulation is the notion of experiential avoidance, as articulated in the theory underlying Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999). Hayes, Wilson, Gifford, Follette, & Strosahl (1996) define experiential avoidance as, “the phenomenon that occurs when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them” (p. 1154). Experiential avoidance is a key process involved in psychological inflexibility, which is characterized by consistent engagement in rigid patterns of behaviors that function to control aversive experiences and typically have deleterious effects, particularly in the long-term (Luoma, Hayes, & Walser, 2007). As a result, experiential avoidance specifically and psychological inflexibility more generally increase the likelihood that an individual will engage in dysfunctional forms of perceptual behavior that function to escape aversive private experiences (i.e., serve as moderators of biased perception functioning to escape aversive private experiences).

The broader cognitive behavior therapy literature defines and describes other constructs related to responding to aversive stimulation. While all of these constructs are related to psychological inflexibility (in fact, each of them is largely considered to be a component of psychological inflexibility; see Luoma et al., 2007; Bond et al., 2011), they are sufficiently distinct to merit independent consideration. The first of these constructs is *distress tolerance*, which refers to one's "capacity to experience and withstand negative psychological states" (i.e., aversive private events; Simons & Gaher, 2005; p. 83). The second of these factors is *emotion regulation*, which involves: "(a) awareness and understanding of emotions, (b) acceptance of emotions, (c) ability to control impulsive behaviors and behave in accordance with desired goals when experiencing negative emotions, and (d) ability to use situationally appropriate emotion regulation strategies flexibly" (Gratz & Roemer, 2004; p. 42). The third and final of these factors is *mindfulness*, which consists of the five distinct facets: (1) observing, (2) describing, (3) acting with awareness, (4) non-judging of inner experience, and (5) non-reactivity to inner experience (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Baer, Smith, Lykins, Button, Krietemeyer, et al., 2008). It is quite possible that processes described by these constructs indicative of dysfunctional responding to aversive stimulation, including distress intolerance, poor emotion regulation, and reactivity to inner experiences, function to increase the likelihood of an individual's engagement in dysfunctional forms of perceptual behavior (in a manner similar to what was described above in relation to psychological inflexibility).

The present research consists of an analogue investigation of a contextual behavioral model of interpersonal perception. The research is focused on identifying

learning histories and environmental variables influencing interpersonal perceptions. It is hypothesized that amount of perceived similarity will be influenced by information about actual levels of similarity. In more technical terms, perceptions about another individual will be influenced by clear discriminative stimuli for particular perceptions (in this case, perceptions of similarity or dissimilarity). It is also hypothesized that attachment avoidance will lead to perceived dissimilarity and attachment anxiety will lead to perceived similarity, particularly under aversive conditions. In more technical terms, a history of reinforcement for perceiving similarity (or dissimilarity) will lead to the occurrence of that form of behavior in a novel circumstance, particularly under motivating operations promoting that behavior. It is further hypothesized that these effects will be moderated by processes reflective of dysfunctional responding to aversive experiences. In other words, behavior of perceiving similarity (or dissimilarity) that functions to reduce momentary distress will be more likely to occur as a person's tendency to dysfunctionally respond to distress increases.

Experimental Design and Variables

The present research has a postmeasure only quasi-experimental design. The dependent variable in the experiment is the similarity between a participant's reported activity preferences (provided in Part 1) and the participant's predicted activity preferences of the perceived other individual (provided in Part 2). The first two independent variables are measured (i.e., non-manipulated) continuous variables related to attachment style (*Avoidant Attachment* and *Attachment Anxiety*). The third and fourth independent variables (*Ostracism* and *Similarity of Preferences*) are manipulations of informational and motivational variables, respectively. The manipulation of these

variables followed a 2x3 factorial design (see Figure 1). A number of additional variables of interest (*Psychological Inflexibility, Distress Intolerance, Deficits in Emotion Regulation, Reactivity to Inner Experiences, and Social Support*) are also measured.

Avoidant attachment and attachment anxiety. As suggested above, from a contextual behavioral perspective these two measured independent variables are proxy measures for learning histories that make an individual likely, particularly under aversive conditions, to perceive others as different or similar, respectively (see Mansfield & Cordova, 2007). Previous studies of the effects of attachment style on interpersonal perceptions (Mikulincer et al., 1998; Mikulincer & Horesh, 1999) categorized individuals as having one of three discrete attachment styles (secure, anxious, or avoidant). Contemporary adult attachment theory suggests that attachment styles are better conceptualized and measured along the two separate dimensions of attachment avoidance and attachment anxiety (Bartholomew, 1990; Bartholomew & Horowitz, 1991; Brennan, Clark, & Shaver, 1998; Mikulincer & Shaver, 2007). As a result, the present research follows that approach to conceptualization and measurement (leading to the two measured independent variables *Avoidant Attachment* and *Attachment Anxiety*).

Ostracism. This third, manipulated independent variable has two levels: complete ostracism and overinclusion. In the overinclusion condition, participants receive a disproportionate amount of ball tosses from purported other participants of an online ball tossing game. In the complete ostracism condition, participants receive no ball tosses following initial receipt of a single ball toss. This ostracism manipulation has been demonstrated to induce a number of aversive private experiences in participants (e.g., needs threat, negative mood; Williams, Cheung, & Choi, 2000; Williams, 2007). From an

attachment theory perspective, complete ostracism should function to increase perceived threat in the moment whereas overinclusion should function to attenuate or eliminate perceived threat in the moment. Thus, the manipulation of ostracism functions as a manipulation of motivating operations (in more general terms a motivational variable).

While investigating attachment-related biases in interpersonal perceptions, Mikulincer and colleagues (1998) previously investigated the impact of motivational manipulations (i.e., manipulations of current level of distress) on the accuracy of those perceptions. In their Study 4, participants were instructed (within a 2x2 factorial design) to recall specific relationship partners. In particular, participants were instructed to: (1) recall a relationship that had a positive or negative impact on their lives and (2) recall a happy or negative interaction with their relationship partner.⁷ In their Studies 5 and 6, participants watched 10 minutes of either a comedy film or a tragedy-focused documentary film about a car accident. The present manipulation of *Ostracism* provides a similar manipulation of current level of distress. However, the present manipulation more closely replicates factors (i.e., successful and unsuccessful interactions) likely to be motivating individuals within interpersonal contexts.

Similarity of preferences. The fourth, manipulated independent variable, *Similarity of Preferences*, has three levels: no information, dissimilar preferences, and similar preferences. In the no information condition, participants are provided with no further information about the individual about whom they were making judgments. In the dissimilar preferences condition, participants are provided with information indicating

⁷ Thus four conditions were present: (1) positive relationship, happy interaction, (2) negative relationship, negative interaction, (3) negative relationship, positive interaction, and (4) negative relationship, negative interaction.

that the individual had preferences that are different than the participant's preferences. In the similar preferences condition, participants are provided with information indicating that that individual has preferences that are similar but not identical to the participant's preferences. The manipulation of the presented similarity of the preferences of the other person to the preferences of the participant thus serves as a manipulation of the discriminative stimuli available when the participant attempts to tact the preferences of the other person (i.e., was a manipulation of a cognitive variable).

While investigating attachment-related biases in interpersonal perceptions, Mikulincer and colleagues (Mikulincer et al., 1998; Mikulincer, 1999) provided information about perceived individuals in only two of their studies. In their Study 6, Mikulincer and colleagues' (1998) confederates perceived by participants provided information about their own alleged personality traits prior to participants' report of their perceptions of the personality traits of the confederates. No experimental manipulation was implemented regarding the alleged personality traits of the confederates; in all cases the confederate reported five personality traits (of 10 total traits reported) that were shared with the participant. In their Study 3, Mikulincer and Horesh (1999) also provided participants with information about personality traits of fictional individuals to be perceived by the participants. Information provided was experimentally manipulated such that the fictional individuals had six personality traits (of 10 total traits reported) that were: (1) personality traits a participant reported him- or herself as having (i.e., were shared with the participant), (2) personality traits negatively evaluated by the participant, or (3) were personality traits that a yoked participant reported having or negatively

evaluated (i.e., were unrelated to the personality traits present in or evaluated by the participant).

While also a manipulation of information provided about an individual to be perceived, the manipulation of *Similarity of Preferences* in the present research differs from previous studies in two important ways. First, the manipulation provides information about preferences rather than personality traits. Providing information about preferences more closely replicates the processes that occur when individuals form a relationship in the “real world.” Rather than being exposed to global impressions provided by personality traits, individuals getting to know each other are often exposed to a series of events that progressively provide more information about each other. Moreover, information about another person’s preferences provides important information about that person’s attractiveness and compatibility with oneself (see Davis, 1981), and global personality traits do not provide as much information in this regard. Second, the present manipulation is intended to specifically investigate the impact of information indicating that the person to be perceived is either similar or dissimilar to the participant. This is different than earlier research that investigated informational variables only indicating that the person to be perceived was similar (i.e., shared some traits) or incidentally different (i.e., did not share traits with the participant). Thus, the manipulation allows for more in depth investigation of the impact of information on interpersonal perception.

Dysfunctional responding to aversive stimulation. As noted above, there are a variety of constructs that could reflect dysfunctional patterns of responding to aversive stimulation. Four such constructs are measured in the present research and are

represented by the variables *Psychological Inflexibility*, *Distress Intolerance*, *Deficits in Emotion Regulation*, and *Reactivity to Inner Experiences*. These variables are measured in order to determine their possible moderation of the hypothesized relationship between induction of distress and inaccuracy of perceptions.

Social support. An additional motivational factor potentially impacting a person's engagement in inaccurate perceptual behavior is the amount of social support he or she typically experiences. High levels of general experienced social support are likely to reduce an individual's reactivity to aversive events. Moreover, experiencing social support on a regular basis will make an individual less likely to engage in biased perceptual behavior. There is less motivation to engage in this behavior because the socially mediated reinforcement maintaining biased perceptual behavior (i.e., feeling connected, instrumental support) is readily available in other circumstances. Because of this likely impact of social support on perceptual processes, participant's level of experienced *Social Support* is measured as a possible covariate, and statistical analyses are used to control for the effect of this variable on the dependent variable.⁸

Perceived similarity. As stated above, the primary dependent variable in the experiment is the similarity between a participant's reported activity preferences and the predicted activity preferences of the perceived individual (*Perceived Similarity*). Perception of activity preferences serves as an analogue for other perceptions of partners important for long-term relationship satisfaction and stability (e.g., perceptions of partners' thoughts, feelings, attitudes, and values). This analogue dependent variable was chosen because the function it serves in the present experimental setting (i.e., determining

⁸ Note that this variable was ultimately excluded in final data analyses.

relationship compatibility with a stranger) is similar to the function perceptions of partners' thoughts, feelings, attitudes, and attitudes serve in the context of long-term relationships. Namely, these perceptions are important guides to a person's behavior with respect to a particular relationship partner (e.g., when deciding whether to dissolve or progress a relationship).

Hypotheses

There are a number of specific hypotheses regarding the influence of the independent variables on the dependent variable.

Hypothesis 1. There will be a main effect for the variable *Similarity of Preferences*. In the dissimilar preferences condition, *Perceived Similarity* will be comparatively low. In the similar preferences condition, *Perceived Similarity* will be comparatively moderate. In the no information condition, *Perceived Similarity* will be comparatively high. These predictions reflect an expectation that participant reports about the perceived individual will correspond to the information available to them (i.e., will report less similarity in conditions when less similarity is presented and more similarity when more similarity is presented). In the dissimilar preferences condition, the perceived individual is presented as quite dissimilar to the participant. In the similar preferences condition, the perceived individual is presented as quite similar but not identical to the participant. In the no information condition, it is predicted that participants will base their reports of the perceived individual's preferences solely on the basis of their own preferences (given that it is the only information available to them). The perceived individual is thus expected to be functionally perceived as identical to the participant.

Hypothesis 2. Attachment style variables will significantly influence *Perceived Similarity*. As *Avoidant Attachment* increases, perceived similarity of preferences will decrease (Hypothesis 2a). *Avoidant Attachment* is conceptualized as a proxy measure for a history of reinforcement for perceiving others as dissimilar. Thus, an increased history of reinforcement for perceiving others as dissimilar should result in decreases in perceived similarity of preferences. Additionally, as *Attachment Anxiety* increases, perceived similarity of preferences will increase (Hypothesis 2b). *Attachment Anxiety* is conceptualized as a proxy measure for a history of reinforcement for perceiving others as similar. Thus, an increased history of reinforcement for perceiving others as similar should result in increases in perceived similarity of preferences.

Hypothesis 3. There will be a significant interaction between *Ostracism* and the attachment style variables. Overinclusion will attenuate the effects of *Avoidant Attachment* and *Attachment Anxiety* on *Perceived Similarity*, and complete ostracism will exacerbate them. Overinclusion will reduce motivation to misperceive others. Under such conditions it is expected that participants will experience minimal levels of distress, and thus the discriminative stimuli setting the occasion for biased perceptual behavior will not be present. In contrast, complete ostracism will increase motivation to misperceive others by increasing levels of distress experienced. Thus, clear discriminative stimuli and motivating operations for biased perceptual behavior will be present under these conditions. Under these conditions, as *Avoidant Attachment* increases, perceived similarity of preferences will be even lower (Hypothesis 3a), and as *Attachment Anxiety* increases, perceived similarity of preferences will be even higher (Hypothesis 3b).

Hypothesis 4. Dysfunctional responding to aversive stimulation will moderate the effects of the interaction between *Avoidant Attachment* and complete ostracism on *Perceived Similarity* and the effects of the interaction between *Attachment Anxiety* and complete ostracism on *Perceived Similarity*. Higher levels of dysfunctional responding to aversive stimulation are conceptualized as indicative of an intolerance for aversive experiences and a restricted repertoire for responding to distressing situations, so increasing levels of inflexibility is expected to increase likelihood of the emission of behaviors that function to escape the aversive aspects of negative evaluation. Thus, with increased *Psychological Inflexibility*, increased *Avoidant Attachment* will result in lower levels of perceived similarity following complete ostracism (Hypothesis 4a1). Likewise, with increased *Psychological Inflexibility*, higher *Attachment Anxiety* will result in higher levels of perceived similarity following complete ostracism (Hypothesis 4a2). Identical hypotheses are formulated with respect to the other variables reflective of dysfunctional responding to aversive stimulation, *Distress Intolerance* (Hypotheses 4b1 and 4b2), *Deficits in Emotion Regulation* (Hypotheses 4c1 and 4c2), and *Reactivity to Inner Experiences* (Hypotheses 4d1 and 4d2).

Method

Participants

Participants consisted of undergraduate students enrolled in the University of Nevada, Reno. Participants were recruited through the Psychology Department SONA system, word of mouth such as presentations in undergraduate psychology classrooms, and advertisement flyers placed throughout the campus. Participants were offered course credit in return for their participation. No other form of compensation was offered to any

participant. A total of 638 participants completed the online survey constituting Part 1 of the experiment. Of those participants, 377 provided contact information that allowed them to be invited to participate in Part 2 of the experiment. A total of 109 participants completed Part 2 of the experiment. After 20 participants were excluded as spoiled (as described below in the Results section), the final dataset consisted of 89 participants. Of those 89 final participants, a large majority were female ($n= 75$; 84.3%). Their age ranged from 18 to 51 years ($M= 23.45$; $SD= 7.066$). A large proportion were heterosexual ($n= 85$; 95.5%), as opposed to gay or lesbian ($n= 3$; 3.4%) or bisexual ($n= 1$; 1.1%). Of the 89 final participants, 39 (43.8%) were in a committed dating relationship, 33 (37.1%) were single, 11 (12.4%) were married, 2 (2.2%) were separated, and 4 (4.5%) were divorced.

Materials and Procedure

Part 1 of the experiment was a self-report survey presented within internet-based experiment administration software, and access to the survey was controlled via the Psychology Department SONA system. Part 1 was advertised as a research survey entitled, “A General Survey of Interests and Relationship History.” As part of the formal informed consent process, participants were given the following general information and instructions: “You are being asked to participate in a research study. The purpose of this study is to obtain information from you in a convenient format before you participate in future research studies. This research study consists of a survey asking you to provide multiple pieces of information about yourself. Please respond to all of the questions as accurately and honestly as possible. There are no ‘right answers,’ and you will be eligible for future research no matter how you respond.” After providing informed consent and generating a unique participant code used to preserve the confidentiality of experiment

data, participants were then presented with the following measures. Note that other measures focused on other constructs (which will not be presented or discussed) were administered during Part 1. Most typically, participants completed all measures in approximately 30 minutes.

Demographic information form. The demographic information form (Appendix A) was specifically generated for the proposed research. This form was used to collect a variety of pieces of personal information from participants. Other information provided (i.e., sex, age, sexual orientation, current relationship status, current relationship satisfaction) was gathered in order to describe the sample and to allow for possible secondary data analyses. The final item (current relationship satisfaction) was adapted from the Dyadic Adjustment Scale (DAS; Spanier, 1976). All other items were standard items commonly used in survey research.

Experiences in Close Relationships Inventory (ECR). The ECR (Brennan et al., 1998; Appendix B) is a self-report measure of the two dimensions of attachment style (anxiety and avoidance). Responses to the ECR's 36 items are provided using a 7-point Likert-type scale (1= "Disagree strongly," 7= "Agree strongly"). Following reverse scoring of specific items, responses to the 18 odd-numbered items are summed to generate an *Avoidant Attachment* score, with higher scores reflecting increased *Avoidant Attachment*. Similarly, following reverse scoring, responses to the 18 even-numbered items are summed to generate an *Attachment Anxiety* score, with higher scores reflecting increased *Attachment Anxiety*. The ECR has consistently exhibited high levels of reliability and validity across a large number of research studies (Brennan et al., 1998; Mikulincer & Shaver, 2007).

Acceptance and Action Questionnaire (AAQ-II). The AAQ-II (Bond, et al., 2011; Appendix C) is a self-report measure of psychological inflexibility. Respondents indicate how true each item is of them using a 7-point Likert-type scale (1= “Never true,” 7= “Always true”). Item responses are summed to obtain a total score, with higher scores indicating higher levels of *Psychological Inflexibility*. Previous research indicates that the AAQ-II has adequate reliability and validity (Bond et al., 2011).

Distress Tolerance Scale (DTS). The DTS (Simons & Gaher, 2005; Appendix D) is a self-report measure of distress tolerance. Respondents indicate their level of agreement with 15 items using a 5-point Likert-type scale (1= “Strongly Agree,” 5= “Strongly Disagree”). Responses to items belonging to four different subscales are averaged to create individual subscale scores. The overall score of the DTS is the mean of the four subscale scores, with higher scores indicating higher levels of *Distress Intolerance*. Previous research indicates that the overall score of the DTS has adequate reliability and validity (Simons & Gaher, 2005).

Difficulties in Emotion Regulation Scale (DERS). The DERS (Gratz & Roemer, 2004; Appendix E) is a self-report measure of one’s ability to regulate emotional experiences. Respondents indicate how often statements made in 36 items apply to them using a 5-point Likert-type scale [1= “Almost never (0-10% of the time),” 5= “Almost always (91-100% of the time)"]. Following reverse scoring of specific items, responses to items can be summed to create subscale scores for six subscales derived through factor analysis (Non-acceptance of emotional responses, Difficulties engaging in goal directed behavior, Impulse control difficulties, Lack of emotional awareness, Limited access to emotion regulation strategies, and Lack of emotional clarity) as well as an overall DERS

score. Higher scores on the DERS indicate greater *Deficits in Emotion Regulation*. Initial research suggests that the DERS has adequate reliability and validity (Gratz & Roemer, 2004).

Five Facet Mindfulness Questionnaire (FFMQ). The FFMQ (Baer et al., 2006; Baer et al., 2008; Appendix F) is a self-report measure of a variety of aspects of mindfulness. Respondents indicate how true 39 items are of them using a 5-point Likert-type scale (1= “Never or very rarely true,” 5= “Very often or always true”). Utilized in the present research is the 7-item subscale related to non-reactivity to emotional experiences (FFMQ Subscale 1). In conventional scoring of the FFMQ, scores on that subscale are obtained by summing responses to the items in the subscale. In the present research, however, scores on this subscale were obtained by summing reverse-scored responses to items in each subscale. Thus, in the present research, higher subscale score was indicative to higher levels of *Reactivity to Inner Experiences*. Research on the FFMQ suggests that its subscales, including the individual subscale used in the present research, have adequate reliability and validity (Baer et al., 2006; Baer et al., 2008).

Social Support Questionnaire Satisfaction Scale (SSQSS). The SSQSS (Appendix G) is a component of the Social Support Questionnaire Short Form (SSQSR; Sarason, Sarason, Shearin, & Pierce, 1987) is a self-report measure of an individual’s general level of experienced social support. Instead of requiring participants to list out individuals (as is required in the full version of the SSQSR), participants were instructed to consider the individuals who provide them will support in six different areas. They then indicated their level of satisfaction with the support they receive in that area using a 6-point Likert-type scale (1= “Very dissatisfied,” 6= “Very satisfied”). Item responses are

summed to obtain a total *Social Support* satisfaction score. Initial research suggests that the SSQSS has acceptable reliability and validity, particularly for such a short measure (Sarason et al., 1987).⁹

Activity Preferences Scale (APS). The APS (Appendix H) is a 20-item questionnaire measuring an individual's enjoyment of various common activities. Responses to items are provided using a 6-point Likert-type scale (1= "Strongly Dislike," 6= "Strongly Like"). Responses to the APS were used in part to calculate the primary dependent variable, *Perceived Similarity*.¹⁰ Items composing the APS were primarily adapted from the 320-item Pleasant Events Schedule (PES; MacPhillamy & Lewinsohn, 1982), a behavioral self-report measure of the reinforcing values of a variety of activities. While a majority of the items of the APS were directly adapted from the PES, during adaptation some items were combined or slightly reworded to reflect contemporary activities. While the PES has been demonstrated to be reliable and valid, there is currently no research on the psychometric properties of the APS or its items.

The final component of Part 1 of the experiment consisted of a separate survey to which participants were forwarded immediately upon completion of the measures described above. Participants were asked to answer the following question to indicate willingness to receive advertisements for Part 2 of the experiment, "Are you willing to be contacted about future research participation opportunities?" Participants were also asked to provide personal information (i.e., full name, email address) to facilitate both

⁹ As noted above, the variable *Social Support* was ultimately excluded from final analyses.

¹⁰ Participants were additionally asked to identify the five APS items with the greatest informational importance to them (i.e., items that, if another individual's responses to them were known, would provide participants with useful information about the quality of the interactions they would have with that other individual; see Davis, 1981). Analyses of *Perceived Similarity* with respect to those specific items are not reported here.

contacting of participants with advertisements and to granting of course credit for participation.

Participants willing to receive advertisements were contacted regarding Part 2 via their provided email address. Participants received up to three email advertisements that were sent out on a weekly basis. Participants were presented with an opportunity to participate in what was identified as a completely separate study on the “Factors Impacting Interpersonal Attraction.” The advertisement also provided information on how to sign up for participation in that research study (i.e., Part 2) using the Psychology Department SONA system.

Part 2 of the experiment was conducted in the research laboratory of the author’s primary advisor by the author or trained research assistants. Participants were greeted in a waiting area, led to an isolated research room, and instructed to sit in front of a computer used in administration of the experiment. In order to reduce distractions during the experiment, participants were instructed to place their belongings in a separate, secure area of the research laboratory for the remainder of the experiment. Throughout the experiment, the experimenter administering the session waited just outside of the isolated research room. Participants were given the following brief initial written overview of the study as part of the initial informed consent process: “You are being asked to participate in a research study. The purpose of this study is to obtain information about factors influencing a person’s attraction to another person. In particular, this study attempts to identify how information about another person affects someone’s attraction to that person. This study will also explore the impact of one’s personal characteristics on the relationship between information about another person and attraction to that person.”

After providing informed consent, participants were exposed to the two experimental manipulations (independent variables *Ostracism* and *Similarity of Preferences*) following a 2x3 factorial design. In the first experimental manipulation, *Ostracism*, participants were exposed to a computer-based ball-tossing game in which they received either a disproportionate number of ball tosses (overinclusion) or no ball tosses (complete ostracism). In the second experimental manipulation, *Similarity of Preferences*, the participant were exposed to a hypothetical other participant's responses to the APS. Participants were exposed to APS responses that were similar to their Part 1 APS responses (similar preferences condition), not reported (no information condition), or dissimilar to their Part 1 APS responses (dissimilar preferences condition).

Exposure to these manipulations was determined by block randomization. This means that randomization occurred in a stratified manner based on participant categorical attachment style with the goal of having participants in each attachment style group receiving equal numbers of exposures to each of the six possible conditions. This stratification was intended to promote dispersion of *Avoidant Attachment* and *Attachment Anxiety* (the measured independent variables) across the experimental conditions. Similar to Mikulincer and colleagues (1998) and Mikulincer and Horesh (1999), participants were classified by their primary attachment style. Following from current adult attachment theory, though, individuals will be classified as having *secure*, *preoccupied*, *fearful-avoidant*, and *dismissive-avoidant* attachment styles (rather than secure, anxious, or avoidant attachment styles; Bartholomew, 1990; Bartholomew & Horowitz, 1991; Mikulincer & Shaver, 2007). This classification will be based on participant responses to the ECR in Part 1 using the procedures developed by Brennan, Clark, and Shaver (1998).

In general, *secure* individuals will have low scores in both the avoidant attachment and attachment anxiety subscales, *preoccupied* individuals will have a low score in the avoidant attachment subscale and a high score in the attachment anxiety subscale, *fearful-avoidant* individuals will have high scores in both the avoidant attachment and attachment anxiety subscales, and *dismissive-avoidant* individuals will have a high score in the avoidant attachment subscale and a low score in the anxious attachment subscale.

Participants were exposed to the first experimental manipulation using a version of the Cyberball ostracism procedure (Williams et al., 2000; Williams & Jarvis, 2006). The participant was seated alone in front of a computer screen and was presented with the following text: “Welcome to Cyberball, the interactive ball-tossing game used for mental visualization. To prepare you for the tasks you will complete later in this session, we need you to practice your mental visualization skills. We have found that the best way to do this is to have you play an online ball tossing game. In a few moments, you will be playing a ball tossing game with other students over our network. The game is very simple. When the ball is tossed to you, simply click on the name of the player you want to throw it to. When the game is over, just go on to the next part of the experiment. What is important is not your ball tossing performance, but that you MENTALLY VISUALIZE the entire experience. Imagine what the others look like. What sort of people are they? Where are you playing? Is it warm and sunny or cold and rainy? Create in your mind a complete mental picture of what might be going on if you were playing this game in real life. Okay, ready to begin? Please click on the ‘Next’ button to begin.” This text was nearly identical to the Cyberball introduction typically provided to research participants (Williams & Jarvis, 2006; p. 175). The initial sentence was slightly modified so that the

text better fit the purported task of the experiment while still emphasizing that participants actively visualize the experience of tossing the ball with others.

Participants then played the interactive Cyberball game (Williams & Jarvis, 2006). Participants were instructed to visualize a ball-tossing game involving themselves and two other players (three players total). While presented as real students, these other players were actually entities generated and controlled by the Cyberball program. The game involves players throwing a single virtual ball to each other in turn.¹¹ All research participants initially received one throw of the ball from one of the other purported participants and subsequently passed the ball to the other purported participant by clicking on those individuals.

The remainder of the participants' experience in the Cyberball game was determined by experimental condition. Participants in the overinclusion condition received throws from the other purported participants at a total probability of 67%. This probability is much higher than would be expected based on equal inclusion in the game (probability of receiving a toss of 33%). In contrast, participants in the complete ostracism condition received no further throws from the purported participants (i.e., the other players tossed the ball back and forth and never threw the ball to the participant). This probability is much lower than would be expected based on equal inclusion of the game. This experimental manipulation (i.e., the specific probability of receiving tosses from other players in each condition) replicated methods of Williams and colleagues (2000). The Cyberball game concluded after a total of 30 throws have been made, which

¹¹ A more detailed description of the Cyberball game can be found in Williams and Jarvis (2006).

is a typical number of throws for a Cyberball experimental manipulation (Williams, 2007).

Following these manipulations, participants rated their current mood. As in Mikulincer and colleagues (1998; Studies 5 and 6), participants were instructed to rate their mood on a 7-point Likert-type scale (1= “Highly Negative;” 4= “Neutral;” 7= “Highly Positive”). Participants also responded to four questions typically used to assess the hypothesized effects of ostracism manipulations (Williams et al. 2000; Williams, 2007). Responses were provided using a 9-point Likert-type scale (1= “Not at All;” 9= “Very Much”). The question, “How much do you feel you belonged to the group?” assessed the participants’ current feelings of belongingness. The question, “How true is the statement: ‘Life is meaningless?’” assessed the participants’ current feelings of meaningful existence. The question, “How true is the statement: ‘I am in control of my life?’” assessed the participants’ current feelings of control. Finally, the question, “To what extent do you think the other participants value you as a person?” assessed the participants’ current self-esteem. Participant responses to these five items served as a check of the amount of distress resulting from the manipulation of the third independent variable (*Ostracism*).

Following this, participants were exposed to the second experimental manipulation in the following manner. Initially, participants were presented with the following text: “You will now have a chance to view the actual responses of another person to a survey of activity preferences. For the remainder of this study, this other person will be referred to as ‘Sam.’ Please note that ‘Sam’ is more than likely not the actual name of this other person. As you view Sam’s responses to a survey of activity

preferences, please consider whether you would be willing to be in any type of relationship with Sam. Sam's responses to a survey of activity preferences have been printed on paper for your review. They are contained in the manila folder sitting near you on the desk. Please open the manila folder now and review Sam's responses to the survey of activity preferences. As you view Sam's responses, please remember to consider whether you would be willing to be in any type of relationship with Sam.”

Participants then viewed a paper copy of the hypothetical participant's purported responses to the APS (see Appendix I for an example). Degree of similarity of the hypothetical participant's purported responses to the APS was manipulated using Byrne's (1971) constant discrepancy method (see Davis, 1981, for an example of the use of this method). A “similar” response to an APS item was one rating category away from the participant's own response and was in the same qualitative direction as the participant's response (e.g., an item “liked” by the participant will also be “liked” by the hypothetical other participant). Specifically, in creating “similar” responses to individual items, participant responses of “1” resulted in Sam responses of “2,” participant responses of “2” resulted in Sam responses of “1,” participant responses of “3” resulted in Sam responses of “2,” participant responses of “4” resulted in Sam responses of “5,” participant responses of “5” resulted in Sam responses of “6,” and participant responses of “6” resulted in Sam responses of “5.” In contrast, a “dissimilar” response to an APS item was 3 rating categories away from the participant's own response and was in the opposite qualitative direction as the participant's response (i.e., an item “liked” by the participant will be “disliked” by the hypothetical other participant and vice versa). Specifically, in creating “dissimilar” responses to individual items, participant responses

of “1” resulted in Sam responses of “4,” participant responses of “2” resulted in Sam responses of “5,” participant responses of “3” resulted in Sam responses of “6,” participant responses of “4” resulted in Sam responses of “1,” participant responses of “5” resulted in Sam responses of “2,” and participant responses of “6” resulted in Sam responses of “3.”

Participants in the similar preferences condition were presented with APS responses that were “similar” for 80% of items (i.e., 16 of the 20 total items) and “dissimilar” for the remaining 20% of items (i.e., 4 of the 20 total items). Participants in the dissimilar preferences condition were presented with responses that were “similar” for 20% of items and “dissimilar” for the remaining 80% of items. The specific similar items to dissimilar items ratios in both conditions (i.e., 20% versus 80%) followed the method used in Davis (1981) for an analogous manipulation of similarity. For each individual participant, specific “similar” and “dissimilar” items were determined randomly within the bounds of the ratios defined by experimental condition. Participants in the no information condition were presented with the following message: “Due to an error, Sam’s responses to a survey of activity preferences are not available. Please continue with the experiment, responding to any questions about Sam as best as you are able.”

After participants viewed the paper copy of the hypothetical participant’s purported responses to the APS, they were presented with the following instructions: “If you have not returned Sam’s responses to the survey of activity preferences to the manila folder please do so now. When you have done this, inform the researcher that you have completed your viewing of Sam’s responses so that you may receive further instructions.

Do nothing else until you have told the researcher that you have completed your viewing of Sam's responses. In other words, do not click the "Next" button until told to do so by the researcher." Participants informed the experimenter administering the session when they were finished viewing Sam's APS responses. The experimenter collected the sheet containing the APS responses of Sam, checked to make sure the participant had not proceeded further in the experiment than instructed, and permitted the participant to proceed further in the experiment. Following that brief interaction, participants were again isolated and remained so for the rest of the experiment.

At that time, the participants again complete the APS. Unlike Part 1, however, participants were asked to fill out the measures from memory such that their responses reflected their perceptions of the activity preferences of their respective purported other participant. This measure was introduced with the following instructions: "You will now be presented with a survey of activity preferences. Please respond to them in the way that you imagine Sam would respond. Please respond to all of the questions as honestly and accurately as possible based on your recollection of Sam's responses and your general impression of Sam."

When the participants finished filling out the APS, they were asked to respond to additional questions that served a variety of purposes. The initial question, "Did you respond to these surveys/questionnaires in the way you think that Sam would?" dichotomously assessed whether the participant accurately understood the instructions of the experiment and appropriately provided APS responses with respect to the purported other participant. As noted below, data from participants responding negatively this question were eliminated from final analyses.

Two additional questions were used to assess the participants' impression of the level of similarity themselves and the hypothetical other participant. The first of these two questions, "On a scale of 1 to 10, with 1 meaning 'not at all' and 10 being 'very much,' how similar are your and Sam's activity preferences?" obtained a general assessment of the participant's perception of similarity of activity preferences with the hypothetical other participant. The second of these two questions, "On a scale of 1 to 10, with 1 meaning 'not at all' and 10 being 'very much,' how similar are you and Sam?" obtained a general assessment of the participant's perception of overall similarity with the hypothetical other participant. Participant responses to these items served as a check of the amount of perceived similarity to the purported other participant resulting from the manipulation of the fourth independent variable (*Similarity of Preferences*).¹²

An additional sets of questions ("Do you have any suspicions about the reasons you were asked to provide ratings about Sam's attitudes?"; "If yes, what are they?"; "If yes, how did these suspicions influence your responses?"; "Have you ever participated in a Cyberball game or heard of the Cyberball game?"; "If yes, what do you know about it?"; "If yes, why do you think you participated in a Cyberball game today?") assessed whether participants ascertained the purpose of the study in a manner that should have precluded his or her data from the analysis of results. Responses to the latter two questions were provided in an open-ended format and were evaluated qualitatively. As noted below, data from participants that provided a response indicating that they

¹² At this point in the procedure, participants responded to a small set of other questions regarding their reactions to the purported other participant. These questions focused on attraction toward and willingness to be in a relationship with the purported other participant and were used to collect data for potential secondary analyses. These questions and participant responses to them are not presented or discussed.

ascertained the true purpose of the study or had clear prior knowledge of the Cyberball ostracism manipulation were excluded from data analysis.

At that time participation in the study was completed. Participants were debriefed as appropriate (e.g., told of the deception used in the research, given an opportunity to ask questions about the research). Participants were also asked to provide their continued consent to have their individual data saved and included in the final data analysis. In all cases participants provided such consent.

Results

The primary research hypotheses were examined using multiple linear regression guided by Cohen, Cohen, West, and Aiken (2003), Aiken and West (1991), and Tabachnick and Fidell (2013). Analyses conducted in relation to each of the primary hypotheses are described below. In order to increase validity and generalizability of the final results, before the analyses were conducted the data were screened and treated as described below, including checking for accuracy of data, dealing with missing data, and examining the fit between the distributions of the variables of interest and the assumptions of multiple linear regression. Unless otherwise noted, all data preparation activities and analyses were conducted using IBM SPSS Statistics Version 20.

Spoiled Participants

As noted above, a total of 109 participants completed Part 2 of the experiment. Of those completers, 20 (18.35%) were excluded from experiment as spoiled participants. Participants were excluded for the following reasons, with the raw number of participants excluded and the corresponding percentage of excluded participants reported parenthetically: (1) participant did not attempt to predict Sam's responses to the APS in

Part 2 (e.g., indicated after the fact that responses reported his or her own preferences; $n=7$; 35%), (2) participant clear prior knowledge of or exposure to the Cyberball ostracism manipulation ($n=6$; 30%), (3) participant not validly exposed to the experimental manipulation (e.g., participant did not follow experiment instructions; experimenter procedural error; $n=4$; 20%), and (4) participant restricted range in predictions of Sam's responses to the APS in Part (e.g., responded "4" to all items; $n=3$; 15%). After the exclusion of participants, a total number of 89 participants were included in the dataset used in the final analyses. Of these final participants, a total of 15 had been assigned to experimental Group 1 (overinclusion and similar preferences), 15 to Group 2 (ostracism and similar preferences), 14 to Group 3 (overinclusion and no information), 14 to Group 4 (ostracism and no information), 16 to Group 5 (overinclusion and dissimilar preferences), and 15 to Group 6 (ostracism and dissimilar preferences).

Accuracy of Data

Because data were collected and stored electronically, the possibility for data inaccuracies was limited. In order to ensure valid results, however, accuracy of data in the dataset was verified by the examination of descriptive statistics for each of the item response variables, including appropriate ranges of responding, and plausible means and standard deviations. This examination revealed no clear inaccuracies within the dataset.

Missing Data

Of all of the numerous data points in the final dataset, a total of 3 were missing. The missing data points were spread across three different participants. Missing data were from three different Part 1 questionnaire items, each with one missing data point, resulting in 1.12% missing data for each of those three items and 0% missing data for all

other items and responses. The items with a single missing data point were, “When I have distressing thoughts or images, I feel calm soon after.” (from the FFMQ), “I am confused about how I feel.” (from the DERS), and “When I’m upset, I become angry with myself for feeling that way.” (also from the DERS). Missing data points were replaced with the mean response value for the specific item from the overall final dataset. The data were then analyzed using both the dataset with missing values (with pairwise deletion) and the dataset with missing data point mean replacement. Results were functionally equivalent across the two datasets. In order to retain as much collected data as possible, the dataset with missing data replaced by item means was utilized for the final analyses presented below.

Manipulation Checks

In order to examine the impact of the manipulation of *Ostracism*, two-tailed *t*-tests were used to compare the responses of participants in the complete ostracism condition versus the overinclusion condition to a variety of items. Table 1 provides a summary of those responses by condition. The first of these items was the 7-point Likert-type item, “Rate your current mood” (1= “Highly Negative;” 4= “Neutral;” 7= “Highly Positive”). Reported mood of participants in the complete ostracism condition was significantly lower than the reported mood of participants in the overinclusion condition, $t(87) = -5.191, p < .01$. The second item was the 9-point Likert-type item, “How much do you feel you belonged to the group?” (1= “Not at All;” 9= “Very Much”). Reported belongingness of participants in the complete ostracism condition was significantly lower than the reported belongingness of participants in the overinclusion condition, $t(87) = -11.504, p < .01$. The third item was the 9-point Likert-type item, “How true is the

statement: ‘Life is meaningless’?’ (1= “Not at All;” 9= “Very Much”). Reported meaningfulness of participants in the complete ostracism condition was not significantly different than the reported meaningfulness of participants in the overinclusion condition, $t(87) = .332, p = ns$. The fourth item was the 9-point Likert-type item, “How true is the statement: ‘I am in control of my life’?” (1= “Not at All;” 9= “Very Much”). Reported control of participants in the complete ostracism condition was not significantly different than the reported control of participants in the overinclusion condition, $t(87) = 1.046, p = ns$. The fifth and final manipulation check item was the 9-point Likert-type item, “To what extent do you think the other participants value you as a person?” Reported self-esteem of participants in the complete ostracism condition was significantly less than the reported self-esteem of participants in the overinclusion condition, $t(87) = -3.017, p < .01$. Overall, these results indicate that participants in the complete ostracism condition were significantly more momentarily distressed than participants in the overinclusion condition.

In order to examine the impact of the manipulation of *Similarity of Preferences*, separate one-way between subjects analyses of variance (ANOVAs) were conducted to compare the responses to two different questions in the similar, dissimilar, and no information conditions. The first question of the questions was, “On a scale of 1 to 10, with 1 meaning ‘not at all’ and 10 being ‘very much,’ how similar are your and Sam’s activity preferences?” There was a significant effect of *Similarity of Preferences* on reported similarity in activity preferences, $F(2, 86) = 52.650, p < .01$. Post hoc comparisons using the Tukey Honestly Significantly Different (HSD) test indicated that the mean response value in the similar condition ($M = 6.57; SD = 2.176; n = 30$) was

significantly higher ($p < .01$) than in the dissimilar condition ($M = 2.65$; $SD = 1.355$; $n = 31$). Mean response value in the no information condition ($M = 6.75$; $SD = 1.647$; $n = 28$) was also found to be significantly higher ($p < .01$) than mean response value in the dissimilar condition. Mean response values in the similar and no information conditions were not significantly different.

Identical results were detected in the analysis of responses to the second question examined, “On a scale of 1 to 10, with 1 meaning ‘not at all’ and 10 being ‘very much,’ how similar are you and Sam?” There was again a significant effect of *Similarity of Preferences* on reported overall similarity, $F(2, 86) = 44.668$, $p < .01$. In addition, post hoc comparisons using the Tukey Honestly Significantly Different (HSD) test again indicated that the mean response value in the similar condition ($M = 6.23$; $SD = 1.942$; $n = 30$) was significantly higher ($p < .01$) than in the dissimilar condition ($M = 2.81$; $SD = 1.424$; $n = 31$). Moreover, mean response value in the no information condition ($M = 6.36$; $SD = 1.569$; $n = 28$) was again also found to be significantly higher ($p < .01$) than mean response value in the dissimilar condition. Finally, mean response values in the similar and no information were again not significantly different. Overall, these results demonstrate that, compared to participants in the dissimilar preferences condition, participants in the similar preferences and no information conditions perceived the purported other participant as significantly more similar to themselves.

Creation of Analytic Variables

The following variables were created to represent the independent variables in the regression analyses. The three conditions of *Similarity of Preferences* were dummy-coded with the no information condition group serving as the comparison group, creating

the variables *similarity1dum* (representing the similar condition) and *similarity2dum* (representing the dissimilar condition). The three conditions of *Similarity of Preferences* were similarly effect-coded, creating the variables *similarity1eff* (representing the similar condition) and *similarity2eff* (representing the dissimilar condition). An effect-coded variable reflecting the manipulation of *Ostracism* (with complete ostracism coded as “1” and overinclusion as “-1”), *ostracismeff*, was also created. In addition, variables reflecting the measured dimensions of attachment, *avoid* (ECR *Avoidant Attachment* score) and *anxiety* (ECR *Attachment Anxiety* score) were created. Furthermore, variables reflecting *Psychological Inflexibility* (*inflexible*; AAQ-II total score), *Distress Intolerance* (*intolerance*; DTS total score), *Deficits in Emotion Regulation* (*dysregulation*; DERS total score), *Reactivity to Inner Experiences* (*reactivity*; FFMQ Subscale 1 total score), and *Social Support* (*socsupport*; SSQSS total score) were created.¹³ These variables were then centered; the mean of each of the variables was subtracted from all individual values of a variable such that the mean of each variable was zero.

Finally, the following variables reflecting the interaction of other variables were created: (1) *ostracismeffXavoid*, (2) *inflexibleXavoid*, (3) *ostracismeffXanxiety*, (4) *inflexibleXanxiety*, (5) *ostracismeffXinflexible*, (6) *ostracismeffXavoidXinflexible*, (7) *ostracismeffXanxietyXinflexible*, (8) *ostracismeffXavoid*, (9) *intoleranceXavoid*, (10) *ostracismeffXanxiety*, (11) *intoleranceXanxiety*, (12) *ostracismeffXintolerance*, (13) *ostracismeffXavoidXintolerance*, (14) *ostracismeffXanxietyXintolerance*, (15) *ostracismeffXavoid*, (16) *dysregulationXavoid*, (17) *ostracismeffXanxiety*, (18) *dysregulationXanxiety*, (19) *ostracismeffXdysregulation*, (20)

¹³ Again note that the variable *socsupport* was excluded from the final data analysis.

*ostracism*eff*Xavoid**Xdysregulation*, (21) *ostracism*eff*Xanxiety**Xdysregulation*, (22) *ostracism*eff*Xavoid*, (23) *reactivity**Xavoid*, (24) *ostracism*eff*Xanxiety*, (25) *reactivity**Xanxiety*, (26) *ostracism*eff*Xreactivity*, (27) *ostracism*eff*Xavoid**Xreactivity*, and (28) *ostracism*eff*Xanxiety**Xreactivity*.

As outlined above, the primary dependent variable of the experiment was a participant's perceived similarity in activity preferences with the hypothetical other participant. A measure of perceived dissimilarity was obtained for each participant by calculating the sum of the absolute value of the differences between his or her responses to individual APS items to the responses he or she reported that the hypothetical other participant would provide to the corresponding items.¹⁴ This yielded a total perceived dissimilarity score ranging from 0 to 100, with higher scores indicating greater levels of perceived dissimilarity. This total score was then reverse scored to create a *Perceived Similarity* (analytic variable *persim*) score also ranging from 0 to 100, with higher scores indicating greater levels of perceived similarity.

Examination of Variables of Interest

The mean, standard deviation, and range of values for each variable of interest included in the final data analyses are reported in Table 2. These descriptive statistics are indicative of acceptable ranges of responding on each variable given the conducted analyses. In addition, the internal consistencies of all of measures constituting the independent variables of the primary analyses were examined using Cronbach's alpha.

The 18-item ECR Avoidant Attachment subscale (analytic variable *avoid*) had a

¹⁴ As an example, a participant's response to APS item 1 (e.g., 3) will be subtracted from the participant's predicted response of the hypothetical other participant to same item (e.g., 5). The absolute value of this difference (in this case 2) will be summed with the absolute values of the differences for all other items to generate the perceived dissimilarity score.

Cronbach's alpha coefficient of .948. The 18-item ECR Attachment Anxiety subscale (*anxiety*) had a Cronbach's alpha coefficient of .928. The 7-item AAQ-II (*inflexible*) had a Cronbach's alpha coefficient of .876. The 15-item DTS (*intolerance*) had a Cronbach's alpha coefficient of .933. The 36-item DERS (*dysregulation*) had a Cronbach's alpha coefficient of .943. Finally, the FFMQ Subscale 1 (*reactivity*) had a Cronbach's alpha coefficient of .705. These coefficients are indicative of excellent internal consistency of the ECR subscales, the DTS, and the DERS, good internal consistency of the AAQ-II, and acceptable internal consistency of the FFMQ Subscale 1. Finally, Pearson's correlations between each of the variables of interest included in the final data analyses are reported in Table 3. Of particular note, the four variables representing dysfunctional forms of responding to aversive stimulation, *inflexible*, *intolerance*, *dysregulation*, and *reactivity* were, as would be expected, significantly positively correlated. At the same time, these variables were generally only moderately correlated with each other (though *dysregulation* was somewhat largely correlated with *inflexible* and *intolerance*), supporting the notion that these variables reflect unique constructs worthy of individual consideration.

Univariate Outliers and Normality

Identification of univariate outliers and the examination of univariate normality of variables utilized in regression analyses were conducted within each of the six experimental groups. Results of these investigations are thus reported by experimental group. Individual data points were identified as univariate outliers if the absolute values of the *z*-score for that value was greater than 3. Univariate normality of a variable was tested by the Shapiro-Wilk test (alpha of .05) of the null hypothesis that the distribution

of values in the variable are normally distributed. Thus, a statistically significant Shapiro-Wilk test ($p < .05$) was indicative of significant univariate non-normality.

When univariate non-normality of a variable was detected, box plots were used to identify the most extreme cases on that variable. Extreme univariate scores were then excluded from the dataset, and in nearly all circumstances this deletion of extremes scores resulted in univariate normality of the variable. This strategy was taken because the alternative approach to eliminating univariate non-normality, variable transformation, was deemed inappropriate given that the non-normal variables represented interactions. One of the two exceptions to this was the variable *socsupport*, which was significantly non-normal in almost all experimental groups (typically with significant negative skew). As a result, this variable was eliminated from the final analysis, and it is not included in the descriptions of each group below. The other exception was the dependent variable perceived similarity of preferences (*persim*), which was significantly non-normal in experimental Group 5. Two extreme scores on that variable in Group 5 were identified but ultimately retained in order because they appeared to represent a meaningful cluster of values. Also of note is that none of the independent variables representing single scales (e.g., *anxiety*, *intolerance*) were found to be significantly non-normal. The only significantly non-normal independent variables were those representing interaction terms in the regression analyses.

In Group 1 (overinclusion and similar preferences), no univariate outliers were identified. Three variables were found to be non-normal. A total of five extreme data points were eliminated from those variables. In Group 2 (ostracism and similar preferences), no univariate outliers were identified. Four variables were found to be non-

normal. A total of seven extreme data points were eliminated from those variables. In Group 3 (overinclusion and no information), no univariate outliers were identified. Five variables were found to be non-normal. A total of eight extreme data points were eliminated from those variables. In Group 4 (ostracism and no information), no univariate outliers were identified. Three variables were found to be non-normal. A total of seven extreme data points were eliminated from those variables. In Group 5 (overinclusion and dissimilar preferences), a single univariate outlier was identified and eliminated. Five variables were found to be non-normal. A total of nine data points were eliminated from those variables. In Group 6 (ostracism and dissimilar preferences), no univariate outliers were identified. One variable was found to be non-normal. A total of three extreme data points were eliminated from those variables. Overall, 39 total data points were eliminated as extreme scores in their respective experimental groups.

Multivariate Outliers

Following elimination of univariate outliers and extreme values, a number of statistics were utilized in the attempt to identify and describe multivariate outliers in the dataset. All of these statistics were generated by the running of the hypothesis-testing regression analyses described below. Mahalanobis distance of individual cases was evaluated using a chi-square distribution with degrees of freedom equal to the number of variables entered into a regression equation. Values with $p < .001$ were identified as multivariate outliers. Leverage of individual cases was also evaluated. Cases with leverage greater than $(2*k)/n$, with k equal to the number of variables entered into the regression equation and n equal to the number of cases in the analysis, were identified as multivariate outliers. Influence of individual cases, as represented by Cook's D, was

additionally examined. Cases with Cook's D greater than $4/(n-k-1)$ were identified as multivariate outliers. Finally, standardized residuals were also examined. Cases with absolute values of standardized residuals greater than 2 were identified as multivariate outliers. As with univariate outliers, exploration for possible multivariate outliers was conducted within each of the six experimental groups. Moreover, given the variety of regression equations used in the testing of the research hypotheses, exploration for multivariate outliers was conducted with respect to each of the hypotheses.

In Group 1 (overinclusion and similar preferences), two cases were identified as multivariate outliers with respect to Hypothesis 1, Hypothesis 2, Hypothesis 3a, and Hypothesis 3b. One case was consistently identified as a multivariate outlier via the examination of standardized residuals. The other case was consistently identified as a multivariate outlier via examination of Cook's D. The case identified as an outlier by examination of standardized residuals was identified as an outlier with respect to Hypothesis 4a1, Hypothesis 4a2, Hypothesis 4b1, Hypothesis 4b2, Hypothesis 4c2, and Hypothesis 4d1, all again via examination of standardized residuals. An additional case was identified as a multivariate outlier with respect to Hypothesis 4a2 via a significant value of Cook's D.

In Group 2 (ostracism and similar preferences), a single case was identified as a multivariate outlier with respect to Hypothesis 1, Hypothesis 2, Hypothesis 3a, and Hypothesis 3b. This case was identified as a multivariate outlier via significant values on examination of standardized residuals and Cook's D. This case was also identified as a multivariate outlier with respect to Hypothesis 4a1, Hypothesis 4b1, and Hypothesis 4c1. In each instance this case was identified as a multivariate outlier by its significant value

of Cook's D. Three additional multivariate outliers were separately identified by Cook's D with respect to Hypothesis 4a1, Hypothesis 4b1, and Hypothesis 4d2, respectively (one outlying case for each hypothesis).

In Group 3 (overinclusion and no information), no multivariate outliers were identified by any method with respect to any hypothesis. In Group 4 (ostracism and no information), no multivariate outliers were identified with respect to Hypothesis 1, Hypothesis 2, Hypothesis 3a, or Hypothesis 3b. One case was identified by Cook's D as a multivariate outlier with respect to Hypothesis 4a1, Hypothesis 4a2, and Hypothesis 4d1. An additional case was identified by Cook's D as an outlier with respect to Hypothesis 4a2.

In Group 5 (overinclusion and dissimilar preferences), a single case was identified by Cook's D as a multivariate outlier with respect to Hypothesis 1, Hypothesis 2, Hypothesis 3a, and Hypothesis 3b. A separate case was identified by Cook's D as a multivariate outlier with respect to Hypothesis 4c2. Yet another separate case was also identified by Cook's D as a multivariate outlier with respect to Hypothesis 4d1.

In Group 6 (ostracism and dissimilar preferences), a single case was identified by examination of standardized residuals as a multivariate outlier with respect to Hypothesis 1, Hypothesis 2, Hypothesis 3a, and Hypothesis 3b. This case was also identified by examination of standardized residuals as a multivariate outlier with respect to Hypothesis 4a1, Hypothesis 4a2, and Hypothesis 4b2. This case was moreover identified by Cook's D as a multivariate outlier with respect to Hypothesis 4c1, Hypothesis 4c2, and Hypothesis 4d2. A separate case was identified by Cook's D as a multivariate outlier with

respect to Hypothesis 4b1. Finally, yet another case was identified by Cook's D as a multivariate outlier with respect to Hypothesis 4c1.

In summary, the number of cases in each group representing multivariate outliers with respect to a specific research hypothesis ranged from zero (0% of cases in an experimental group) to two (up to 14.29% of cases in an experimental group). Examination of Mahalanobis Distance and Leverage indicated no multivariate outliers in any of the groups. Only Cook's D (a measure of influence of a case on the regression equation of the line fit to a dataset) or examination of standardized residuals (a measure of a cases deviation from the value predicted by a calculated regression equation) identified multivariate outliers in the dataset.¹⁵

Given this information, there is reason to suspect that the presently detected multivariate outliers primarily consist of outliers on the dependent variable in the various experimental groups. This is also supported by the fact that, as was noted above, two cases with extreme univariate values on the dependent variable in Group 5 were retained, and one of those cases was found to be a multivariate outlier with respect to multiple hypotheses. There is no clear theoretical reason for completely eliminating the identified multivariate outliers from the analysis, as there is no reason to consider these cases as outside of the intended sample of the experiment. As a result, final data analyses were performed with identified multivariate outliers retained in the dataset. Given that transformation of the dependent variable was deemed inappropriate for these analyses and thus not conducted, final data analyses were performed with the awareness that the

¹⁵ Note also that all cases identified as multivariate outliers via examination of standardized residuals had values greater than 2 but less than 3. Thus, they were identified as outliers under only the strictest criteria for the examination of standardized residuals (Tabachnick & Fidell, 2013).

retained multivariate outliers on the dependent variable might excessively influence results. In order to investigate this possibility, regression analyses were repeated on a dataset with multivariate outliers deleted. Differences in results between analyses of the full dataset (i.e., multivariate outliers retained) and the reduced dataset (i.e., multivariate outliers deleted) are reported below.

Linearity

Linearity of the relationship between variables was examined via visual inspection of bivariate scatterplots of variables within each experimental group. This inspection suggested that linearity of variables was satisfactory. This conclusion is also supported by the significant correlations between variables (Table 3).

Multicollinearity and Singularity

Absence of multicollinearity and singularity within the regression analyses was supported by a number of investigative methods. Correlations between variables representing the independent variables of the experiment were not very highly correlated (the highest Pearson's correlation between variables was .700; see Table 3). Moreover, examination of tolerance (with tolerance values less than .01 deemed to be significantly low), variance inflation factors (with values greater than 5 deemed to be significantly high), and condition indices and variance (with a condition index greater than 30 deemed to be significantly high) in each of the performed regression analyses all suggested against the presence of multi-collinearity and singularity within the regression analyses.

Independence of Errors

Independence of errors for each regression analysis was tested using the Durbin-Watson statistic, with $p < .05$ used to determine statistical significance. In all regression

analyses, the Durbin-Watson statistic was not significant, supporting the independence of errors within the regression analyses.

Homogeneity of Variance

Given the 2x3 group design of the experiment, homogeneity of variance in the dependent variable across experimental groups was examined.¹⁶ Homogeneity of variance across the six experimental groups was tested using Levene's test, with $p < .05$ used to determine statistical significance. A non-significant result, $F(5, 83) = 1.841$, $p = .114$, indicated the presence of homogeneity of variance in the dependent variable across experimental groups.

Overall, the above analyses suggest that the distributions of the variables of interest did indeed fit the assumptions of multiple linear regression. As a result, the following reported tests of hypotheses are regarded as valid with respect to statistical assumptions.

Hypothesis 1

It was hypothesized that there would be a main effect for the manipulated variable *Similarity of Preferences*. More specifically, it was hypothesized that average participant ratings of *Perceived Similarity* would be highest in the no information group and lowest in the dissimilar preferences group, with average ratings of similarity in activity preferences in the similar preferences group falling in between (i.e., would be significantly lower than in the no information group and significantly higher than in the dissimilar preferences group). In order to test this hypothesis, *persim* was regressed onto

¹⁶Homogeneity of variance, rather than homoscedasticity, is an assumption of multiple linear regression when a grouped design has been employed Tabachnick and Fidell (2013).

a number of variables in a sequential (also frequently referred to as a hierarchical) fashion. The first variables entered into the regression equation were *avoid*, *anxiety*, *ostracism_{eff}*, *ostracism_{eff}X_{avoid}*, and *ostracism_{eff}X_{anxiety}*. Adding these variables into the equation controlled for the effects of attachment style, the manipulation of the variable *Ostracism*, and the interaction between attachment style and *Ostracism*. Following this, the dummy-coded variables *similarity_{dum1}* (representing effects of the similar preferences condition compared to the reference no information condition) and *similarity_{dum2}* (representing effects of the dissimilar preferences condition compared to the reference no information condition) were added into the equation. Table 4 summarizes the results of this final regression.

Significance of the effects of *Similarity of Preferences* was examined using an *F*-test of the increase in the R^2 value when *similarity_{dum1}* and *similarity_{dum2}* were added to the equation. The R^2 value increased by .825 when those variables were added into the equation. This represented a statistically significant increase in R^2 , $F(2, 81) = 219.622$, $p < .01$. A Cohen's f^2 statistic was calculated by hand to determine the size of the effect of *Similarity of Preferences*. As interpreted by the effect size conventions introduced by Cohen (1988),¹⁷ the result ($f^2 = 5.428$) suggested that this effect was very large in size. Because the initial *F* test was statistically significant, *t*-tests of the differences of the regression coefficients for the dummy-coded variables from zero allowed for the direct examination of the hypothesized differences between each of the comparison groups (similar preferences, dissimilar preferences) and the reference group (no information).

¹⁷ By this convention an f^2 value is evaluated similar to other effect sizes, with a value of .02 indicative of a small effect, .15 indicative of a medium effect, and .26 indicative of a large effect.

The first test demonstrated that the regression coefficient for the variable *similaritydum1* was significantly less than zero, $t(81) = -5.243, p < .01$. The second test demonstrated that the regression coefficient for the variable *similaritydum2* was significantly less than zero, $t(81) = -20.027, p < .01$. An additional hand-calculated *t*-test demonstrated that the regression coefficient for similarity for *similaritydum2* was significantly smaller than the regression coefficient for *similaritydum1*, $t(81) = -15.049; p < .01$. Together, these results demonstrate that *Perceived Similarity* was significantly higher in the no information group than in the similar preferences group and that *Perceived Similarity* was significantly higher in the in the similar preferences group than in the dissimilar preference group.

As discussed above, the reported primary data analyses were conducted on a final dataset that retained identified multivariate outliers. In order to examine the possible influence of these outliers on the results, analyses were repeated on the reduced dataset from which multivariate outliers had been deleted. With respect to this hypothesis, results of this repeated analysis were nearly identical and are not reported further.

Hypotheses 2a and 2b

It was hypothesized that, as *Avoidant Attachment* increased, *Perceived Similarity* would decrease (Hypothesis 2a). It was also hypothesized that, as *Attachment Anxiety* increased, *Perceived Similarity* would increase (Hypothesis 2b). In order to test this hypothesis, *persim* was regressed onto a number of variables. The variables *ostracismeff*, *similarityeff1*, and *similarityeff2* were entered into the regression equation to control for the effects of *Ostracism* and *Similarity of Preferences*. The variables *avoid* and *anxiety* were also entered into the equation to test the respective effects of avoidant attachment

and attachment anxiety on perceived similarity of preferences. Table 5 summarizes the results of this regression.

Separate *t*-tests of the significance of the regression coefficients for *avoid* and *anxiety* (i.e., their difference from zero) tested the significance of the effects of these variables on *persim*. The *t*-test of the regression coefficient for the variable *avoid* was statistically significant, $t(83) = 2.018, p < .05$, indicating that *Perceived Similarity* significantly increased as avoidant attachment increased. The *t*-test of the regression coefficient for the variable *anxiety* was also statistically significant, $t(83) = -2.053, p < .05$, indicating that *Perceived Similarity* significantly decreased as attachment anxiety increased.

These analyses were repeated on the reduced dataset from which multivariate outliers had been deleted. Table 6 summarizes the results of this regression. Results were not appreciably different with respect to the variable *avoid*, *Perceived Similarity* continued to significantly increase as *Avoidant Attachment* increased. In contrast, results were different with respect to the variable *anxiety*. The test of the regression coefficient for the variable was no longer statistically significant, indicating no statistically significant relationship between *Attachment Anxiety* and *Perceived Similarity*. However, these results are not meaningfully different with respect to the present hypotheses and are thus not presented in further detail.

Hypotheses 3a and 3b

It was hypothesized that there would be significant interactions between *Ostracism* and the attachment style variables. It was expected that overinclusion would attenuate, and complete ostracism exacerbate, the respective expected effects of *Avoidant*

Attachment and *Attachment Anxiety* on *Perceived Similarity*. More specifically, increasing *Avoidant Attachment* would more significantly negatively predict *Perceived Similarity* in the complete ostracism condition (Hypothesis 3a), and increasing *Attachment Anxiety* would more significantly positively predict *Perceived Similarity* in the complete ostracism condition (Hypothesis 3b).

In order to test this hypothesis with regard to *Avoidant Attachment* (Hypothesis 3a), *persim* was regressed onto a number of variables in a sequential fashion. The first variables entered into the regression equation were the effect-coded variables *similarity1eff* and *similarity2eff*. Adding these variables into the equation first controlled for the effects of the manipulation of the variable *Similarity of Preferences*. The variables *avoid* and *ostracism* were also added to the regression equation. The variable *ostracismeffXavoid* was then added to the regression equation at a later step. Table 7 summarizes the results of this regression. Significance of the interaction between *Ostracism* and *Avoidant Attachment* was examined using an *F*-test of the increase in the R^2 value when the variable *ostracismeffXavoid* was added to the regression equation. The R^2 value increased by .008 when that variable was added into the equation. This represented a statistically significant increase in R^2 , $F(1, 82) = 4.056, p < .05$.

Because this initial test was statistically significant, post-hoc analyses following Aiken and West's (1991) guidelines were used to explore the detected interaction. A Cohen's f^2 statistic was calculated by hand to determine the size of the effect of the interaction. This statistic ($f^2 = .052$) was suggestive of a relatively small effect size of the interaction between *Ostracism* and *Avoidant Attachment*. The components of the interaction were explored via the plotting of two lines representing the effects of *avoid* on

persim, one for each of the two levels of *Ostracism*. A graphical representation of these lines is provided in Figure 2. Separate *t*-tests of the simple slopes of these lines, which tests whether the slope of a line significantly deviates from zero, were conducted by hand. Results indicated that the line representing the impact of *Avoidant Attachment* on *Perceived Similarity* in the overinclusion condition had a significant positive slope, $t(82) = 2.8788, p < .01$. For participants in the overinclusion condition, as *Avoidant Attachment* increased, *Perceived Similarity* significantly increased. In contrast, results indicated that the line representing the impact of *Avoidant Attachment* on *Perceived Similarity* in the ostracism condition had a non-significant negative slope, $t(82) = -.0096, p = ns$. Thus, for participants in the ostracism condition, there was no significant impact of *Avoidant Attachment* on *Perceived Similarity*.

This analysis was repeated on the dataset from which multivariate outliers were deleted. Table 8 summarizes the results of this regression. This repeated analysis revealed clear differences in results when examining the reduced dataset. Again, significance of the interaction between *Ostracism* and avoidant attachment was examined using an *F*-test of the increase in the R^2 value when the variable *ostracism \times avoid* was added into the regression equation. In the reduced dataset, the R^2 value increased by only .001 when that variable was added into the equation. This represented a non-significant increase in R^2 , $F(1, 77) = .549, p = ns$. Thus, the hypothesized interaction between *Avoidant Attachment* and *Ostracism* was not statistically significant in the reduced dataset. Given this lack of a significant result, post-hoc statistical explorations were not conducted with respect to this specific analysis. However, a plot of the two lines representing the effects of *avoid* on

persim, one for each of the two levels of *Ostracism* was generated and is presented in Figure 3.

Analyses testing the present hypothesis with respect to *Attachment Anxiety* (Hypothesis 3b) mirrored those just described. All variables were added into the regression equation in a similar manner except *avoid* and *ostracism \times avoid*, which were respectively replaced by the variables *anxiety* (*Attachment Anxiety* score) and *ostracism \times anxiety* (the interaction between *Ostracism* and *Attachment Anxiety*). Table 9 summarizes the results of this regression. Significance of the interaction between *Ostracism* and attachment anxiety was examined using an *F*-test of the increase in the R^2 value when the variable *ostracism \times anxiety* was added to the equation. The R^2 value increased by .002 when that variable was added into the equation. This represented a non-significant increase in R^2 , $F(1, 82)= 1.134$, $p= ns$, demonstrating that the hypothesized interaction between *Attachment Anxiety* and *Ostracism* was not significant. Because the interaction was non-significant, post-hoc explorations were not conducted. Results were not meaningfully different when the reduced dataset with multivariate outliers deleted was analyzed, and these results are not reported further.

Hypotheses 4a1 and 4a2

It was hypothesized that *Psychological Inflexibility* would moderate the effects of the interaction between *Attachment Avoidance* and *Ostracism* on *Perceived Similarity* and the effects of the interaction between *Attachment Anxiety* and *Ostracism* on *Perceived Similarity*. More specifically, as *Psychological Inflexibility* increased, higher *Attachment Avoidance* would result in even lower levels of *Perceived Similarity* following complete ostracism (Hypothesis 4a1), and higher *Attachment Anxiety* would

result in even higher levels of *Perceived Similarity* following complete ostracism (Hypothesis 4a2). In a regression approach, moderation is treated as an interaction. Consequently, the present hypotheses were understood in terms of a three-way interaction between *Ostracism*, attachment-related variables, and *Psychological Inflexibility*. Thus, the analyses regarding the present hypotheses, while slightly more complex, generally reflected the strategy of the analyses for Hypotheses 3a and 3b.

In order to test the present hypothesis with respect to *Avoidant Attachment* (Hypothesis 4a1), *persim* was yet again regressed onto a number of variables in a sequential fashion. The effect-coded variables *similarity1eff* and *similarity2eff* were again entered into the regression equation first in order to control for the effects of the manipulation of the independent variable *Similarity of Preferences*. Simultaneously, the variables *anxiety*, *avoid*, *ostracismeff*, and *inflexible* were also added. Following this, a set of variables reflecting the two-way interactions between all of the variables involved in the hypothesized three-way interaction (*ostracismeffXavoid*, *inflexibleXavoid*, and *ostracismeffXinflexible*) were added to the regression equation. Finally, a variable reflecting the hypothesized second order interaction, *ostracismeffXavoidXinflexibility*, was added to the regression equation. Table 10 summarizes the results of this regression. Significance of the interaction of interest was again examined using an *F*-test of the increase in the R^2 value when the *ostracismeffXavoidXinflexibility* variable was added to the equation. The R^2 value increased by .005 when that variable was added into the equation. This represented a non-significant increase in R^2 , $F(1, 76) = 2.859$, $p = ns$. As a result, the hypothesized moderation of the effects of the interaction between *Avoidant*

Attachment and *Ostracism* by *Psychological Inflexibility* was not statistically significant. Because the interaction was non-significant, post-hoc explorations were not conducted.

Analyses testing the present hypothesis with respect to *Attachment Anxiety* (Hypothesis 4a2) mirrored those just described. All variables were added into the regression equation in a similar manner except variables involving *avoid*, which were respectively be replaced by the variables involving *anxiety* (i.e., *anxiety*, *ostracism \times anxiety*, *inflexible \times anxiety*, *ostracism \times anxiety \times inflexibility*). Table 11 summarizes the results of this regression. Significance of the interaction of interest was again examined using an *F*-test of the increase in the R^2 value when the *ostracism \times anxiety \times inflexibility* variable was added to the equation. The R^2 value increased by .001 when that variable was added into the equation. This represented a non-significant increase in R^2 , $F(1, 76) = 2.859$, $p = ns$, demonstrating that *Psychological Inflexibility* did not moderate the effects of the interaction between *Attachment Anxiety* and *Ostracism* on perceived similarity of preferences. Because the interaction was non-significant, post-hoc explorations were not conducted.

As with other hypotheses, the present analyses were repeated using the reduced dataset with multivariate outliers deleted. The two *F*-tests of the increases in R^2 values were again non-significant. This reproduced the results of the analysis with the full dataset, and these specific results are thus not reported in detail.

Hypotheses 4b1 and 4b2

It was additionally hypothesized that *Distress Intolerance* would moderate the effects of the interaction between *Avoidant Attachment* and *Ostracism* on *Perceived Similarity* and the effects of the interaction between *Attachment Anxiety* and *Ostracism*

on *Perceived Similarity*. It was expected that the effects of *Distress Intolerance* would be similar to those of as *Psychological Inflexibility*. As *Distress Intolerance* increased, higher *Attachment Avoidance* would result in even lower levels of *Perceived Similarity* following complete ostracism (Hypothesis 4b1), and higher *Attachment anxiety* would result in even higher levels of *Perceived Similarity* following complete ostracism (Hypothesis 4b2). These hypotheses were again tested as interactions within a multiple linear regression analysis.

The analyses for Hypotheses 4b1 and 4b2 were nearly identical to the analyses for Hypotheses 4a1 and 4a2. The sole difference was the substitution of variables related to *inflexibility* with variables related to *intolerance*. Thus, the significance of the hypothesized interaction between *Ostracism*, *Avoidant Attachment*, and *Distress Intolerance* (Hypothesis 4b1) was examined with an *F*-test of the increase in the R^2 value of when the *ostracism \times avoid \times intolerance* variable was added sequentially to the regression equation. Table 12 summarizes the results of this regression. Regarding the change in R^2 , the value increased by .004 when the three-way interaction variable was added into the equation. This represented a non-significant increase in R^2 , $F(1, 76)=1.908$, $p=ns$. Thus, *Distress Intolerance* did not significantly moderate the effects of the interaction between *Avoidant Attachment* and *Ostracism* on *Perceived Similarity*. As with a majority of the other analyses, because the interaction was non-significant, post-hoc explorations were not conducted.

Similarly, the significance of the hypothesized interaction between *Ostracism*, *Attachment Anxiety*, and *Distress Intolerance* (Hypothesis 4b2) was examined with an *F*-test of the change in the R^2 value of when the *ostracism \times anxiety \times intolerance* variable

was added sequentially to the regression equation. Table 13 summarizes the results of this regression analysis. The change in the R^2 value with the addition of this variable was .000, which was a non-significant increase, $F(1, 75) = .060, p = ns$. This demonstrated that *Distress Intolerance* did not significantly moderate the effects of the interaction between *Attachment Anxiety* and *Ostracism* on *Perceived Similarity*. Post-hoc explorations were not conducted given this non-significant result.

As with the analyses reported earlier, the present analyses were repeated in the reduced dataset with multivariate outliers eliminated. Results were not meaningfully different and are thus not reported in further detail.

Hypotheses 4c1 and 4c2

Hypotheses 4c1 and 4c2 were nearly identical to Hypotheses 4a1, 4a2, 4b1, and 4b2, except that *Emotion Dysregulation*, instead of *Psychological Inflexibility* or *Distress Intolerance*, was the hypothesized moderator of the interaction between attachment variables and *Ostracism*. In other words, as *Emotion Dysregulation* increased, higher *Attachment Avoidance* would result in even lower levels of *Perceived Similarity* following complete ostracism (Hypothesis 4c1), and higher *Attachment anxiety* would result in even higher levels of *Perceived Similarity* following complete ostracism (Hypothesis 4c2). Analyses related to these hypotheses were again nearly identical to those reported earlier, the only exception being the replacement of variables related to *Psychological Inflexibility* and *Distress Tolerance* with variables related to *Emotion Dysregulation* in the regression analyses.

The significance of the hypothesized interaction between *Ostracism*, *Avoidant Attachment*, and *Emotion Dysregulation* (Hypothesis 4c1) was examined with an F -test

of the increase in the R^2 value of when the *ostracism*eff*X**avoid**X**dysregulation* variable was added sequentially to the regression equation. Table 14 summarizes the results of the regression. The change in the R^2 value with the addition of this variable was .000, which was a non-significant increase, $F(1, 74) = .053, p = ns$, demonstrating that *Emotion Dysregulation* did not significantly moderate the effects of the interaction between *Avoidant Attachment* and *Ostracism* on *Perceived Similarity*. Post-hoc explorations were not conducted given this non-significant result.

Similarly, the significance of the hypothesized interaction between *Ostracism*, *Attachment Anxiety*, and *Emotion Dysregulation* (Hypothesis 4c2) was examined with an F -test of the increase in the R^2 value of when the *ostracism*eff*X**anxiety**X**dysregulation* variable was added sequentially to the regression equation. Table 15 summarizes the results of the regression. The corresponding change in R^2 was .005, which was not a statistically significant increase, $F(1, 73) = 2.302, p = ns$. Thus, *Emotion Dysregulation* did not significantly moderate the effects of the interaction between *Attachment Anxiety* and *Ostracism* on *Perceived Similarity*. As with the other non-significant interaction findings, additional post-hoc explanations were not conducted.

The present analyses were repeated with the reduced dataset from which multivariate outliers had been deleted. The results of the analyses remained non-significant, so these analyses are not presented in further detail.

Hypotheses 4d1 and 4d2

Finally, analyses were conducted to test Hypotheses 4d1 (moderation of the effects of the interaction between *Avoidant Attachment* and *Ostracism* on *Perceived Similarity* by *Reactivity to Inner Experiences*) and 4c2 (moderation of the effects of the

interaction between *Attachment Anxiety* and *Ostracism* on *Perceived Similarity* by *Reactivity to Inner Experiences*). Specifically, as *Reactivity to Inner Experiences* increased, higher *Attachment Avoidance* would result in even lower levels of *Perceived Similarity* following complete ostracism (Hypothesis 4d1), and higher *Attachment Anxiety* would result in even higher levels of *Perceived Similarity* following complete ostracism (Hypothesis 4d2). These present analyses directly followed the strategies and procedures of Hypotheses 4a1 through 4c2. The only difference was the replacement of variables related to the other hypothesized moderators with the presently hypothesized moderator, *Reactivity to Inner Experiences*.

The significance of the hypothesized interaction between *Ostracism*, *Avoidant Attachment*, and *Reactivity to Inner Experiences* (Hypothesis 4d1) was examined with an *F*-test of the increase in the R^2 value of when the *ostracism \times avoid \times reactivity* variable was added sequentially to the regression equation. Table 16 summarizes the results of the regression. The addition of the interaction variable increased the R^2 by .009. This increase was statistically significant, $F(1, 70) = 4.707, p < .05$. This significant result indicates that *Reactivity to Inner Experiences* did moderate the effects of the interaction between *Avoidant Attachment* and *Ostracism* on *Perceived Similarity*.

Post-hoc analyses guided by Aiken and West (1991) were used to explore the significant moderation by *Reactivity to Inner Experiences* of the effects of the interaction between *Avoidant Attachment* and *Ostracism* on perceived similarity of preferences. The size of the effect of the three-way interaction between the variables of interest was examined using a Cohen's f^2 statistic, which was calculated by hand. Results of this test, $f^2 = .066$, were indicative of a relatively small effect size. The components of this three-

way interaction were examined by plotting six different lines representing the effects of *Avoidant Attachment* on *Perceived Similarity* at relatively low (the value 1 standard deviation below the mean), medium (the mean value), and high (the value 1 standard deviation above the mean) levels of *Reactivity to Inner Experiences* across the two levels of the independent variable *Ostracism*. Graphical representations of these lines are provided in Figures 4 (overinclusion condition) and 5 (complete ostracism condition).

Individual *t*-tests of the simple slopes of these lines were conducted by hand.

Within the overinclusion condition, the simple slope of the line representing the impact of *Avoidant Attachment* on perceived similarity of preferences at a relatively low level (1 SD below the mean) of *Reactivity to Inner Experiences* was positive but non-significant, $t(70) = 1.325$, $p = ns$. The simple slope of the line at the mean level of *Reactivity to Inner Experiences* was significantly positive, $t(70) = 2.065$, $p < .05$. The simple slope of the line at a relatively high level (1 SD above the mean) of *Reactivity to Inner Experiences* was similarly positive but not significant, $t(70) = 1.489$, $p = ns$. Of note, while the test of the simple slope was only positive for the line representing the mean level of *Reactivity to Inner Experiences*, the slopes of all three of these lines were equivalent. Overall, these results suggest that, given exposure to the overinclusion manipulation, increases in *Avoidant Attachment* resulted in increases in *Perceived Similarity* across all levels of *Reactivity to Inner Experiences*.

In contrast, results of tests of simple slopes indicated that, in the complete ostracism condition, the effects of increases in *Avoidant Attachment* on *Perceived Similarity* varied across values of *Reactivity to Inner Experiences*. The simple slope of the line representing the impact of *Avoidant Attachment* on *Perceived Similarity* at a

relatively low level (1 SD below the mean) of *Reactivity to Inner Experiences* was significantly positive, $t(70) = 2.201, p < .05$. The simple slope of the line at the mean level of *Reactivity to Inner Experiences* was slightly negative but not statistically significant, $t(70) = -.240, p = ns$. The simple slope of the line at a relatively high level (1 SD above the mean) of *Reactivity to Inner Experiences* was significantly negative, $t(70) = -2.200, p < .05$. Thus, given exposure to complete ostracism: (1) at relatively low levels of *Reactivity to Inner Experiences* increased *Avoidant Attachment* resulted in increased *Perceived Similarity*, (2) at mean levels of *Reactivity to Inner Experiences* increased *Avoidant Attachment* resulted in no significant change in *Perceived Similarity*, and (3) at relatively high levels of *Reactivity to Inner Experiences* increased *Avoidant Attachment* resulted in decreased *Perceived Similarity*.

The significance of the hypothesized interaction between *Ostracism*, *Attachment Anxiety*, and *Reactivity to Inner Experiences* (Hypothesis 4d2) was examined with an *F*-test of the increase in the R^2 value of when the *ostracism* \times *anxiety* \times *reactivity* variable was added sequentially to the regression equation. Table 17 summarizes the results of this regression. The addition of the interaction variable increased R^2 by .006. This increase was not statistically significant, $F(1, 71) = 2.680, p = ns$. This non-significant result indicates that *Reactivity to Inner Experiences* does not significantly moderate the effects of the interaction between *Avoidant Attachment* and *Ostracism* on *Perceived Similarity*. In lieu of this non-significant result, no post-hoc analyses were conducted.

As with all other analyses, the present analyses were repeated in the reduced dataset from which multivariate outliers had been deleted. These repeated analyses were

not functionally different from the results of the analyses of the full final dataset. As a result, these repeated analyses are not reported in further detail.

Statistical Power

Statistical power was examined with respect to each of the hypotheses. All power analyses were conducted using the G*Power 3.1 power analysis program (Faul, Erdfelder, Lang, & Buchner, 2007; Faul, Erdfelder, Buchner, & Lang, 2009). Regarding Hypothesis 1, an a priori power analysis indicated that $n=63$ would be sufficient to detect any effects of interest.¹⁸ In the regression analysis conducted to test Hypothesis 1 using the full dataset (i.e., the dataset in which identified multivariate outliers were retained), a total of 89 participants were included in the dataset. Regarding Hypotheses 2a and 2b, a priori power analyses indicated $n=89$ would be sufficient to detect any effects of interest in either of these tests.¹⁹ In the regression analyses conducted to test Hypotheses 2a and 2b using the full dataset (i.e., the dataset in which identified multivariate outliers were retained), a total of 89 participants were included in the dataset. In the regression analyses conducted to test Hypotheses 2a and 2b using the reduced dataset (i.e., the dataset from which identified multivariate outliers were eliminated), a total of 84 participants were included in the dataset.

¹⁸ Given Statistical Test= Linear multiple regression: Fixed model, R² increase and Input parameters: Effect size= .26 (large effect size), α = .05, Power= .95, Number of tested predictors= 2, and Total number of predictors= 7.

¹⁹ Given Statistical Test= Linear multiple regression: Fixed model, single regression coefficient and Input parameters: Two-tailed test, Effect size= .15 (medium effect size), α = .05, Power= .95, and Number of predictors= 5.

Regarding Hypotheses 3a and 3b, a priori power analyses indicated $n=89$ would be sufficient to detect any effects of interest.^{20,21} In the regression analyses conducted to test Hypotheses 3a and 3b using the full dataset (i.e., the dataset in which identified multivariate outliers were retained), a total of 89 participants were included in the dataset. In the regression analyses conducted to test Hypotheses 3a using the reduced dataset (i.e., the dataset from which identified multivariate outliers were eliminated), a total of 84 participants were included in the dataset. Regarding Hypotheses 4a1, 4a2, 4b1, 4b2, 4c1, 4c2, 4d1, and 4d2, a priori power analyses indicated $n=89$ would be sufficient to detect any effects of interest.^{22,23} The number of participants included in the full dataset (i.e., the dataset in which identified multivariate outliers were retained) used in the regression analyses conducted to test the various hypotheses were as follows: Hypothesis 4a1 ($n=87$), Hypothesis 4a2 ($n=86$), Hypothesis 4b1 ($n=87$), Hypothesis 4b2 ($n=86$), Hypothesis 4c1 ($n=85$), Hypothesis 4c2 ($n=84$), Hypothesis 4d1 ($n=81$), and Hypothesis 4d2 ($n=82$).

Discussion

The results of the present study provide very clear support for Hypothesis 1. Participant perception of similarity to a purported other participant matched the information provided about that other person. Individuals presented to participants as

²⁰ Given Statistical Test= Linear multiple regression: Fixed model, R^2 increase and Input parameters: Effect size= .15 (medium effect size), $\alpha= .05$, Power= .95, Number of tested predictors= 1, and Total number of predictors= 6.

²¹ Aguinis (1995) suggests that power to detect interaction effects in regression analyses may have been overestimated because of a number of factors (e.g., predictor variable range restriction, measurement error). This issue will be addressed further in the discussion section.

²² Again, Aguinis (1995) suggests that power to detect interaction effects in regression analyses may have been overestimated.

²³ Given Statistical Test= Linear multiple regression: Fixed model, R^2 increase and Input parameters: Effect size= .15 (medium effect size), $\alpha= .05$, Power= .95, Number of tested predictors= 1, and Total number of predictors= 11.

similar were perceived as similar, and individuals presented to participants as dissimilar were perceived as dissimilar. In addition, the data supported the underlying hypothesis that, when no information is known about another person, an individual relies on his or her own personal characteristics when making and reporting perceptions about that other person. The primary support for this conclusion in the current study is that participants in the no information condition reported the highest levels of perceived similarity.

Perceived Similarity in that condition was significantly higher than in the similar preferences condition, in which the purported other person was presented as relatively highly similar to participants. The theoretical and practical implications of this finding are discussed below.

In contrast to the very strong support for Hypothesis 1, there was an overall dearth of support for Hypotheses 2 through 4. Hypothesis 2, which proposed that increased *Avoidant Attachment* would lead to decreased *Perceived Similarity* and that increased *Attachment Anxiety* would lead to increased *Perceived Similarity*, was not supported. In actuality, results indicated that relationships opposite to those hypothesized were present. *Perceived Similarity* increased with increased *Avoidant Attachment* and decreased with increased *Attachment Anxiety* (though this particular finding was no longer statistically significant after multivariate outliers were deleted). Thus both Hypothesis 2a and Hypothesis 2b were not supported. The implication of these findings will be discussed below.

Hypothesis 3, which predicted effects of significant interactions between attachment variables and *Ostracism* on *Perceived Similarity*, had only limited support. The effect of *Attachment Anxiety* on *Perceived Similarity* was not significantly different

in participants in the overinclusion condition versus participants in the complete ostracism condition. Thus, Hypothesis 3b was not supported in any way. In contrast, the effect of *Avoidant Attachment* on *Perceived Similarity* was significantly different in participants exposed to overinclusion compared to participants exposed to complete ostracism. Examination of plots (Figure 2) and tests of the simple slopes of lines representing this statistically significant interaction indicated that the interaction was characterized by increasing *Avoidant Attachment* having a significant positive effect on *Perceived Similarity* in the overinclusion condition and *Avoidant Attachment* having no significant effect on *Perceived Similarity* in the complete ostracism condition.

It is of note that the negative impact of increased *Avoidant Attachment* on *Perceived Similarity* in the complete ostracism condition was only relative rather than absolute (i.e., when data for the complete ostracism condition was considered in isolation *Avoidant Attachment* did not have a significant negative effect on *Perceived Similarity*); an absolute negative effect had been expected. The lack of such an absolute negative effect could be explained solely by the apparent strength of the overall positive relationship between *Avoidant Attachment* and *Perceived Similarity*, which was identified in the statistical analysis related to Hypothesis 2a. More specifically, an absolute negative effect of the interaction between complete ostracism and increasing *Avoidant Attachment* could simply have been masked by other processes causing increased *Avoidant Attachment* to have a significant positive effect on *Perceived Similarity*.

However, the lack of an absolute negative effect is even more notable when considering that the significant interaction between *Avoidant Attachment* and *Ostracism* was not present in the reduced dataset (from which identified multivariate outliers had

been eliminated).²⁴ Moreover, within the reduced dataset, the plot of this non-significant interaction (Figure 3) revealed that increasing *Avoidant Attachment* had an overall positive effect on *Perceived Similarity* in the complete ostracism condition. This clear difference between results of analysis of the full dataset ($n= 89$) and the reduced dataset ($n= 85$) causes concern that the detected significant interaction between *Avoidant Attachment* and *Ostracism* was the result of a small number ($n= 5$) of outliers in the full dataset, and in particular, a very small number of outliers in the complete ostracism condition. As was noted in the review of the analytic treatment of multivariate outliers, there is no theoretical reason to consider the five outlying cases as coming from outside of the intended participant population. As a result, it is concluded that Hypothesis 3a was supported by the data, with an accompanying caveat that these results were strongly influenced by a small set of outliers. Implications of the findings related to Hypotheses 3 will be discussed below.

The various formulations of Hypothesis 4 predicted that a variety of forms of dysfunctional responding to aversive stimulation would moderate the effects of the interactions between attachment variables and *Ostracism* (as articulated in Hypotheses 3a and 3b) on *Perceived Similarity*. These hypothesized moderation effects were all investigated as possible three-way interactions in separate multiple linear regression analyses. There was no evidence of significant interactions between *Ostracism*, *Attachment Anxiety*, and the hypothesized moderators: *Psychological Inflexibility* (Hypothesis 4a2), *Distress Intolerance* (Hypothesis 4b2), *Deficits in Emotion Regulation*

²⁴ In fact the associated significance level of the statistic testing for the presence of the interaction, $p= .461$, did not approach significance in any way.

(Hypothesis 4c2), and *Reactivity to Inner Experiences* (Hypothesis 4d2). Thus, each of those hypotheses was not supported.

Similarly, there were no significant interactions between *Ostracism*, *Avoidant Attachment Anxiety*, and the hypothesized moderators: *Psychological Inflexibility* (Hypothesis 4a1), *Distress Intolerance* (Hypothesis 4b1), and *Deficits in Emotion Regulation* (Hypothesis 4c1). Therefore, none of those three hypotheses were supported. Alongside all of the non-significant findings just reviewed, there was evidence of a significant interaction between *Ostracism*, *Avoidant Attachment Anxiety*, and *Reactivity to Inner Experiences*. As demonstrated by plots (Figures 4 and 5) and tests of the simple slopes of the lines representing this significant interaction, in the overinclusion condition, level of *Reactivity to Inner Experiences* did not impact the positive relationship between *Avoidant Attachment* and *Perceived Similarity*. In stark contrast, in the complete ostracism condition, level of *Reactivity to Inner Experiences* did significantly affect the relationship between *Avoidant Attachment* and *Perceived Similarity*. At low and high levels of *Reactivity to Inner Experiences*, increasing *Avoidant Attachment* had respective significant negative and positive effects on *Perceived Similarity*. At medium (mean) levels of *Reactivity to Inner Experiences*, *Avoidant Attachment* had no significant relationship with *Perceived Similarity*. These results were in complete concert with and fully supported Hypothesis 4d1. Again, the implications of all of the findings of the experiment will be discussed further below.

Methodological Issues

Prior to discussing the implications of all of the results of the experiment, it will be beneficial to explore a number of methodological issues that could impact

interpretation of the results. These issues can be categorized as being related to: the impact of experimental manipulations, statistical power, reliance on self-report measures, and use of an analogue experimental preparation.

Impact of experimental manipulations. As summarized above, manipulation of *Ostracism* resulted in participants in the complete ostracism condition reporting significantly higher levels of distress than participants in the overinclusion condition on a number of measures (see Table 1 for a summary). These measures included participant: (1) current mood, (2) feelings of belongingness to the group playing the Cyberball game, and (3) self-esteem as measured by belief in how much other Cyberball players value the participant as a person. As reported in Table 1, this pattern of effects of complete ostracism versus overinclusion is identical to that found in previous research conducted by Williams and colleagues (2000). In addition, comparison of results of the present experiment to those of similar research conducted by Mikulincer and colleagues (1998), which measured mood in a manner identical to the present study, indicated that the impact of *Ostracism* on mood in the present experiment was comparable to the impact of direct mood manipulations (via the presentation of mood induction videos) in that previous research. These results were comparable in both means of reported mood²⁵ and effect size.²⁶ Also as summarized above, manipulation of *Similarity of Preferences* resulted in participants in the similar preferences and dissimilar preferences conditions

²⁵ In Mikulincer and colleagues (1998) Experiment 5, reported mean mood in their distressed condition was 3.78, and reported mean mood in their control condition was 5.74. In their experiment 6, reported mean mood in their distressed condition was 3.97, and reported mean mood in their control condition was 5.10.

²⁶ Hand-calculated effect sizes of *t*-test of ratings of mood following experimental manipulations were as follows: (1) present experiment Cohen's *d*= 1.11, (2) Mikulincer and colleagues (1998) Experiment 5 Cohen's *d*= 1.23, and (3) Mikulincer and colleagues (1998) Experiment 6 Cohen's *d*= .84. All of these effect sizes were indicative of a large effect.

viewing the purported other participant as relatively similar and dissimilar to themselves, respectively. Overall, participant responses to items examining the effects of the experimental manipulations (*Ostracism* and *Similarity of Preferences*) indicated that the manipulations functioned as intended.

Statistical power. Statistical power is not a concern with respect to Hypotheses 1 and 2. Number of participants in the full dataset (n=89) met or exceeded the number of participants estimated to achieve sufficient power to detect the predicted effects, and indeed statistically significant effects were detected.

There are, however, possible concerns regarding the power to detect the significant interaction effects predicted by Hypotheses 3 and 4. First, as remarked in a footnote above, statistical power to detect significant interactions in multiple linear regression is commonly overestimated, resulting in unnecessary dismissal of regression models (Aguinis, 1995). Of particular concern in the present study is the loss of power due to combined effects of the error in measurement of variables involved in tested interactions (for further discussion, see Aguinis, 1995; Aiken & West, 1991). Following from Aguinis' (1995) recommendations, some specific strategies were used in an attempt to prevent critical threats to statistical power. Most importantly, the present research utilized measures that have been previously shown to be reliable and valid, and examination of the present dataset continued to support their overall reliability. In addition, a conservative approach to case elimination was used in order to preserve a full range of responding to variables.

Second, and perhaps more impactful to the statistical power of the current study, is that estimates of number of participants necessary to achieve a high level of power

(Power= .95) were calculated with expectation of medium effect size (Effect size= .15). Analyses of detected significant interactions in the full dataset were suggestive of relatively small effect sizes (Hypothesis 3a $f^2 = .052$; Hypothesis 4d1 $f^2 = .066$). Using the G*Power 3.1 program, calculation of sample size needed to detect effects comparable to those found (Effect Size of .06) indicated that a sample of $n = 219$ would be required in order to test Hypotheses 3 and 4 with the desired level of power.^{27,28} Obviously, the n of this experiment is significantly below this number, ranging from 81 to 89 with respect to analyses related to Hypotheses 3 and 4.

One clear strategy for overcoming this (and previously discussed) threats to power is to inflate sample size (see Aguinis, 1995 for further discussion). However, there are two reasons for not taking this strategy. First, the amount of time required to achieve a sample of this size is prohibitive (amounting to approximately 1 additional year of subject recruitment based on rate of participation). Second, the present research is ultimately aimed at identifying effects with applied significance. As a result, if actual effects are particularly small, it is unlikely that they would usefully inform further applied research or clinical practice. In summary, there are clear threats to power of the current analyses to detect actual significant effects with respect to the experimental hypotheses, particularly if the effects are small in size. However, these threats are not sufficient to call into question the implications of the results of the current study, particularly as its aim is the elucidation of effects that are of clinical significance.

²⁷ Hypothesis 3. Given Statistical Test= Linear multiple regression: Fixed model, R^2 increase and Input parameters: Effect size= .15 (medium effect size), $\alpha = .05$, Power= .95, Number of tested predictors= 1, and Total number of predictors= 6.

²⁸ Hypothesis 4. Given Statistical Test= Linear multiple regression: Fixed model, R^2 increase and Input parameters: Effect size= .15 (medium effect size), $\alpha = .05$, Power= .95, Number of tested predictors= 1, and Total number of predictors= 11.

Reliance on self-report measures. Whenever possible, the present experiment employed behavioral manipulations and measures (e.g., *Ostracism, Similarity of Preferences, Perceived Similarity*). While it would have been preferable to rely solely on direct manipulation and overt behavioral measures of constructs, the present research was forced to heavily rely upon self-report measures. Many of the constructs of interest (e.g., attachment, dysfunctional responding to aversive stimulation) are summaries of behavioral patterns that occur over time. This prevents, or at the very least makes quite difficult, their direct measurement. Related to this, these types of constructs would be extremely difficult to experimentally manipulate. Finally, many of the constructs of interest, particularly those related to responses to aversive stimulation, are focused on behaviors that are covert and thus impossible to directly observe.

Given the consequent need to rely on self-report measures, there is some concern of their impact on the validity of the results. For example, participants might inaccurately respond to self-report measures for a number of reasons, including lack of awareness of their behavior or unintentional deception resulting from prosocial responding. Moreover, strong causal interpretations cannot be made when measured independent variables are utilized. Some of the concerns regarding use self-report measures are allayed by the use of measures that have been demonstrated to be reliable and valid. In addition, self-report measures are widely accepted as valid investigative tools in psychological research, so use of such measures does not represent a significant departure from typical research methods. Ultimately, though, while having some drawbacks, the reliance on self-report measures in this study allowed the conduct of this research, which would have been impossible otherwise.

Use of an analogue experimental preparation. The present research is a computer-based experimental analogue. A number of other experimental settings could potentially have been used to test the research hypotheses (e.g., interaction with confederates in the context of a “speed dating” event). The utilized method had a number of advantages such as increased ease in the recruitment of participants, administration of the experiment, and collection of data. The most important benefit of the utilized method, though, is that it allowed for the control of many other variables that could have adversely impacted experimental results by creating excess “noise” in the data. One variable that was particularly concerning about having participants interact directly with other individuals is physical attractiveness. Given the amount of influence physical attractiveness has on interpersonal interactions and the difficulty in controlling participants’ idiographic evaluations of attractiveness, it was decided that it would be better to control that variable by using a computer-based preparation. As another example, using a computer preparation also eliminates the need to control over the many nonverbal components of interactions. Thus, while present experiment utilized a method that was quite artificial, which may limit eventual generalizability of results, the method had the significant advantages of high levels of experimental control, which increases confidence in the present experimental results.

Implications of the Present Findings

Even with the possible methodological shortcomings discussed above, the present research has a number of extremely important implications. The primary implications are with respect to: (1) attachment theory regarding interpersonal perceptual processes, (2) a contextual behavioral approach to human perceptual processes, and (3) the clinical

treatment of the phenomena investigated in the present experiment. Specific considerations and suggestions for future research are embedded within the discussion of these implications.

Implications for attachment theory. While not specifically designed to contribute to the literature on adult attachment theory, the present research does have some implications with respect to the attachment literature on interpersonal perception. As described above, the present experiment had a number of novel aspects when compared to previous attachment-focused research on interpersonal perceptions (e.g., Mikulincer et al., 1998; Mikulincer & Horesh, 1999). First, the present study measured attachment using the contemporary dimensional system (rather than the historical three-category system). This allows for interpretation of the results in terms of contemporary adult attachment theory. Second, the present study examined the impact of attachment on interpersonal perceptions in a novel content area. Previous research focused on perceptions of the traits and opinions of others, and the present research attempted to reproduce previous findings with regard to perceptions of activity preferences. Third, the present research utilized the experimental manipulation of *Ostracism*, which represents a mood manipulation that more closely approximates daily social events than the direct mood induction videos utilized in previous research. Finally, the present experiment was first to examine the effects of attachment on interpersonal perceptions within the context of relationship-related decision-making. While previous research investigated the impact of attachment on perceptions of others, the present study attempted to extend those findings to a situation in which an individual is evaluating relationship compatibility.

The results related to Hypotheses 3a and 3b of the present study have the clearest implications for the adult attachment literature.²⁹ Overall, the results of the present study at best partially reproduce the findings of the previous research conducted by Mikulincer and colleagues (Mikulincer et al., 1998; Mikulincer & Horesh, 1999). Their previous research found that: (1) an interaction between attachment anxiety and a distress-inducing experimental manipulation (direct manipulation of mood via video presentation) resulted in significantly increased perceived similarity and (2) an interaction between avoidant attachment and a distress-inducing manipulation resulted in significantly decreased perceived similarity. The present experiment only reproduced the latter result (the interaction involving attachment anxiety) and did so only when apparent multivariate outliers were retained in the dataset.

Numerous factors might account for this result. Most simply, given limited sample size, apparent small effect sizes, and potential underestimation of power to detect a significant interaction, the present study may not have had sufficient power to detect real interaction effects that had been detected in previous research. Alternatively, the previously detected interaction effects may represent spurious findings that do not represent typical interpersonal perceptual behavior. More likely than that, though, is that understanding and measurement of attachment style dimensionally rather than categorically allowed for a more detailed and complete investigation the effects of attachment on interpersonal perceptual behavior. In the previous research (Mikulincer et al., 1998; Mikulincer & Horesh, 1999), participants categorized themselves into distinct

²⁹ Results related to Hypotheses 2a and 2b are also likely informative for attachment theory. However, the attachment literature on interpersonal perceptions has not been particularly focused on the main effects of attachment on perceived similarity. Thus, discussion of that particularly topic was not pursued at present.

attachment styles. It is plausible that only participants with relatively high levels of avoidant attachment or attachment anxiety classified themselves as having an attachment style other than “secure.” If this were the case and the detection of significant interactions between attachment and distress is driven by a relatively small number of outlying participants (as is implied by the present results), then it is possible that previous significant findings were the result of outliers concentrated in the non-secure attachment style groups. Unfortunately, lack of information in the publication of previous research findings prevents present investigation of whether outliers similar to those in the present dataset were also present in those previous datasets.

As a result, future research should focus on replicating procedures similar to those used in this study in order to investigate this possibility. If outliers driving a significant interaction were to be detected again in future research, those cases would likely be better identified as a group of individuals who respond in characteristically different ways rather than “outliers.” This would consequently beg for further research attempting to identify what makes that group unique. If significant interactions without the presence of outliers were detected, the most appropriate conclusion would be that the present research findings are anomalous in some way. This would support attachment theory with respect to interpersonal perceptual behaviors as outlined above, namely, that attachment anxiety spurs projective identification and avoidant attachment spurs what might be best be called projective “disidentification” (Mikulincer & Horesh, 1999; Mikulincer & Shaver, 2007). If no significant interactions were detected in future research, it would begin to call into question attachment theory with respect to interpersonal perception. Regardless of the specific methods of any future research, special care should be taken to ensure sufficient

sample size to both: (1) assist in the determination of whether a subset of participants who function as “outliers” actually exists and (2) provide adequate statistical power to detect what may very well be small effects of the interaction between attachment variables and distress.

Implications for a contextual behavioral approach. As extensively discussed above, the present experiment was conceptualized and developed from within a contextual behavioral approach to interpersonal perception. To review briefly, it was theorized that the reporting of interpersonal perceptions consists of the behavior of tacting, which can most simply be understood as the behavior of stating factual information (Skinner, 1957). The behavior of tacting can be influenced by a number of factors, including: (1) the stimuli to which an individual has been exposed (colloquially referred to as the information available to an individual), (2) an individual’s learning history with respect to the behavior of tacting (i.e., whether accurate tacting has been reinforced in the past), and (3) motivating operations that increase the momentary likelihood of particular functional behaviors (traditionally referred to as motivational variables). The purpose of the present experiment was to identify specific, manipulable variables related to individual learning history and environmental events that significantly influence accuracy of perceptions of a potential relationship partner.

The results of the present experiment provide the first empirical investigation of the proposed specific contextual behavioral model of the factors influencing the accuracy of interpersonal perceptions. Results with respect to Hypothesis 1 demonstrate that clear discriminative stimuli do significantly impact interpersonal perceptions (assuming a history of reinforcement for accurate tacting behavior). Individuals presented as similar

were perceived by participants as similar, and individuals presented as dissimilar were perceived as dissimilar. Statistically, the size of the effect of discriminative stimuli on interpersonal perceptions was very large. While this finding is somewhat unsurprising, it is important in two ways. First, it provides clear support for the conceptualization of making and reporting perceptual judgments as tacting behavior. Second, it shows the great importance of clear discriminative stimuli on the tacting behavior that composes perceptual judgments.

Results related to Hypothesis 1 also provide initial empirical support to the novel conjecture that the tendency to perceive others as like oneself (most commonly referred to as *projection*; Hoch, 1987) is the result of tacting influenced by discriminative stimuli related to oneself. This notion was most clearly supported by the result that *Perceived Similarity* was highest in the no information group. When one has no information about another individual, judgments about that individual are typically based on discriminative stimuli that consist of one's own experiences, preferences, and so on. It is of note, however, that presence of clear additional discriminative stimuli can prevent this process of inaccurate perception. This was evidenced by behavior of participants in the dissimilar preferences condition. Clear discriminative stimuli related to another individual precluded or overrode responding to discriminative stimuli related to oneself.

The analysis of perceptual judgments as tacts can be extended to the more foundational phenomenon of anchoring and adjustment, which is characterized by a process in which an initial judgment excessively influences a final judgment under conditions of uncertainty (Tversky & Kahneman, 1974; Chapman & Johnson, 2002; Furnham & Boo, 2011). As noted in the introductory discussion of anchoring and

adjustment, failure to adjust from an initial anchor occurs when there is a lack of motivation, the direction of the adjustment is uncertain, or other distracting factors prevent adjustment (Simmons et al., 2010; Epley & Gilovich, 2006). In technical behavioral terms, anchoring and lack of adjustment occur when appropriate discriminative stimuli do not influence tacting behavior (i.e, there is a breakdown in appropriate stimulus control) because the discriminative stimuli are not present or are in some way unclear (“information” is not available), the individual has an insufficient learning history with respect to those discriminative stimuli (the individual does not know the “meaning” of the stimuli), or other stimuli in the environment unduly influence the behavior (the individual’s responds to other stimuli present in the environment). Compared to the no information condition, in the dissimilar preferences condition the presence of clear discriminative stimuli resulted in sufficient stimulus control such that the perceptual behavior of participants was not appreciably influenced by participants’ own experiences. When all of this information is considered as a whole, the results of the present experiment with respect to Hypothesis 1 provide strong support for the validity of the proposed contextual behavioral model of interpersonal perception.

While they were generally opposite to what was predicted (and thus suggest some revision of the specific contextual behavioral model of interpersonal perception), results related to Hypothesis 2 have no significant implications for the utility of the larger contextual behavioral approach to interpersonal perception. The general focus of Hypothesis 2 was that individual learning history would impact interpersonal perceptions. As discussed extensively above, attachment variables were conceptualized as proxies for particular learning histories. Thus, the content of the specific model driving the

predictions of Hypotheses 2a and 2b should be considered a contextual behavioral interpretation of the adult attachment literature rather than a specific prediction articulated by the contextual behavioral approach in isolation. As a result, the findings of Hypothesis 2 with respect to the contextual behavioral approach are best understood as reflective of an incorrect assumption about how individuals would behave based on the adult attachment literature rather than an indication of a critical flaw within the overall contextual behavioral approach. In many respects, this particular issue reflects how a contextual behavioral approach is ultimately inductive, particularly when a novel content area is being explored. For example, a contextual behavioral approach makes many principle-based predictions about learning processes (e.g., that frequency of a behavior will increase if it is functionally reinforced) but does not make predictions specific predictions (e.g., what types of stimulus events will function as reinforcers) outside of a particular context.

Similar interpretations can be made of the generally non-significant findings with respect to Hypothesis 3. Again, while a specific model was outlined, the overall contextual behavioral approach to interpersonal perceptions made no critical a priori predictions regarding the interaction between attachment variables (which were again conceptualized as proxy variables for particular learning histories) and the manipulation of the variable *Ostracism*. Thus, the findings with respect to Hypotheses 3a and 3b have no bearing on the contextual behavioral approach to interpersonal perception other than that, with respect to the proposed contextual behavioral model: (1) increased *Attachment Anxiety* does not appear to reflect a learning history that significantly interacts with the *Ostracism* manipulation in a way that affects *Perceived Similarity* and (2) increasing

Attachment Avoidance may reflect a learning history that significantly interacts with the *Ostracism* manipulation in a way that negatively affects *Perceived Similarity*. More specifically, the *Ostracism* manipulation may function as a motivating operation that increases the likelihood of an individual's engagement in tacting behaviors commonly described as perceived dissimilarity when that individual has a history of reinforcement (as represented by elevated levels of *Avoidant Attachment*) for engaging in such behaviors when aversively stimulated. However, this effect may hold for only a subset of individuals (presently identified as "outliers"). In the end, these results will need to be reproduced in future research with adequate statistical power before any clear conclusions can be drawn.

Finally, results with respect to Hypothesis 4 have more clear implications for both the contextual behavioral model of and approach to interpersonal perception. As reviewed above, results of analyses related to Hypotheses 4a2, 4b2, 4c2, and 4d2 were all non-significant, dysfunctional responding to distressing stimulation did not moderate the effects on *Perceived Similarity* of an interaction between *Attachment Anxiety* and *Ostracism*. This is unsurprising given the lack of significant findings for Hypothesis 3b; there was no apparent effect of a significant interaction between *Attachment Anxiety* and *Ostracism* to be moderated.

Given a significant result with respect to Hypothesis 3a, the results of analyses related to Hypotheses 4a1, 4b1, 4c1, and 4d1 are worthy of more detailed consideration. Of the four hypothesized moderators, only one (*Reactivity to Inner Experiences*) was found to significantly moderate the effects on *Perceived Similarity* of the interaction between *Avoidant Attachment* and *Ostracism*. As graphically depicted in Figures 4 and 5,

Reactivity to Inner Experiences significantly moderated the interaction between *Avoidant Attachment* and *Ostracism* exactly as expected. As an example, when exposed to a distressing event (the complete ostracism condition), individuals who are more likely to react dysfunctionally to aversive stimulation (as reflected by relatively high levels of *Reactivity to Inner Experiences*) and are more likely to perceive and report interpersonal dissimilarity in response to distress (as reflected by relatively high levels of *Avoidant Attachment*, which is a proxy variable for learning history) reported significantly lower levels of *Perceived Similarity*.

In isolation, this significant moderation of the detected interaction provides strong support for the outlined contextual behavioral model of interpersonal perception. However, it is important to highlight that only one of four hypothesized moderators of the detected significant interaction was significant. While possible, it seems unlikely that the results supporting Hypothesis 4d1 were spurious. As discussed above, the present analyses were likely statistically underpowered, decreasing the likelihood of the occurrence of a Type I error. Moreover, the effect continued to be statistically significant when the reduced dataset (from which multivariate outliers had been deleted) was examined. In addition, as just mentioned the components of the significant three-way interaction representing the moderating effect of *Reactivity to Inner Experiences* were found to be exactly as predicted. The most plausible explanations of the present result are that: (1) the moderating effect of *Reactivity to Inner Experiences* was the only effect large enough to overcome challenges to statistical power or (2) that it was the only variable that truly moderated the effects of the interaction between *Avoidant Attachment* and *Ostracism* on *Perceived Similarity*. If the former (an underpowered experiment) were the

case, the most useful response would be to conduct future research that resolved issues reducing power (as discussed above). If the latter (only *Reactivity to Inner Experiences* is a significant moderator) were the case, it would be best to attempt to articulate why.

Given that, it is presently most important to consider factors that may have distinguished *Reactivity to Inner Experiences* from *Psychological Inflexibility*, *Distress Intolerance*, and *Deficits in Emotion Regulation*. It is not the case that likelihood to detect an interaction effect involving *Reactivity to Inner Experiences* was higher due to the analytic variable *reactivity* (FFMQ Subscale 1 Score) having higher reliability than the other measures. In fact, that variable and scale had the lowest internal consistency, as measured by Cronbach's Alpha. When examining the overall descriptions of and the specific items measuring the four constructs under comparison, though, one difference does emerge. *Reactivity to Inner Experiences* is unique in that it is almost solely focused on one's ability to thoughtfully notice but not engage with one's aversive private experiences. It is possible that the lack of ability to refrain from engaging with distressing private experiences is what moderates the effects of the interaction between *Avoidant Attachment* and *Ostracism*. In that case, if one were able to notice but not be compelled to respond to distress, he or she would not ultimately not engage in behaviors functioning to escape distress, including dysfunctional interpersonal perceptual processes.

Overall, the present results were not fully supportive of the specific contextual behavioral model of interpersonal perception. In particular, the specifically outlined model, as adapted from adult attachment theory, may not have correctly predicted motivational variables influencing accuracy of interpersonal perceptions. At the same time, the results do suggest that there is likely utility in continuing to investigate

interpersonal perceptual processes using the broader contextual behavioral approach. Future research should attempt to reproduce the effects of *Similarity of Preferences* in circumstances that more closely approximate “real world” situations. Future research should also attempt to further investigate possible motivational variables influencing accuracy of interpersonal perceptions. For example, a study replicating many or all of motivation-focused experimental manipulations in a larger sample would likely resolve many of the remaining questions about the present study. Alternatively, future research could test a brief analogue clinical intervention targeting *Reactivity to Inner Experiences* in attempt to attenuate the effects of the interaction between *Avoidant Attachment* and *Ostracism* on *Perceived Similarity*, a study which might have significant clinical implications.

Clinical implications. There are a number of direct clinical implications of the results of the present experiment, which was practically focused on the identification of dysfunctional interpersonal perceptual processes that could have deleterious effects in relationship formation and progression. The most obvious implications stem from the finding that availability and clarity of information can significantly impact interpersonal perceptions. In the present experiment, *Similarity of Preferences* overwhelmingly influenced *Perceived Similarity*. In contrast, the motivational variables that were investigated were found to have relatively minimal impact on *Perceived Similarity*, especially after informally comparing calculated effect sizes for the various statistically significant results.³⁰

³⁰ The effect of *Similarity of Preferences* was very large, while the significant effects of the motivational variables were relatively small.

Though it may not be immediately apparent, these findings are not inconsistent with previous research (e.g., Ickes et al., 1995; Knudson et al., 1980), which indicated that motivational variables can significantly influence accuracy of perceptions of relationship partners. Results of those previous research studies suggested that avoidance of aversive perceptions of a relationship partner reduced accuracy of perceptions of that partner. Results of the present research study suggest that similar motivational variables may have an iatrogenic effect on accuracy of perceptions of another person but that this effect may not be substantial enough to override presentation of clear information about that person. Of note, the present experiment did not examine processes involved in attempts to seek out or avoid information about a potential relationship partner. It may very well be that motivational variables such as those investigated in the present experiment exert more influence on processes involved in the gathering of information about another individual than on processes involved in the perception and interpretation of that information. Investigating that possibility would be a useful endeavor in future research efforts.

All current and historical findings indicate the clinical importance of targeting variables that hinder a person from obtaining accurate information about a potential or current relationship partner. Increasing an individual's access to a current or potential partner's viewpoints, values, beliefs, and so on will allow an individual to more accurately perceive that person, and thus contribute to more effective decision making about participating in or progressing a relationship with that person. In clinical practice, this goal may be achieved via a variety of strategies. One possibility is focusing on open communication between partners by encouraging discussion about topics that are likely

to lead to future disputes (e.g., finances, childrearing). Another possibility is focusing on reducing dysfunctional patterns of interpersonal avoidance, consequently increasing access to information about a partner, by targeting dysfunctional responding to aversive stimulation. For example, given the present results a therapist might teach a client specific skills for effectively noticing but not reacting to emotional distress for the purpose of increasing the likelihood that that individual will effectively participate in potentially aversive conversations with a partner. Applied research in the area of interpersonal perception should focus on elucidating the merits of such strategies.

Concluding Remarks

In conclusion, it is important to note that providing initial empirical support for a contextual behavioral approach to interpersonal perception has other implications beyond the specific phenomena of interest in the present research (i.e., factors promoting inaccurate interpersonal perceptions that lead to dysfunctional relationship-related behavior). It is hoped that this approach can be successfully applied to perceptual behavior in other domains of human judgment and decision-making. For example, identification of contextual manipulations that increase the likelihood that individuals will engage in successful investment strategies has obvious potential benefits. Similarly, increasing the likelihood that individuals will make healthy dietary choices can significantly improve their quality of life in the long-term. Overall, it is hoped that the present research will serve as a starting point for a progressive and fruitful program of basic and applied research focused on a contextual behavioral approach to judgment and decision making.

References

- Aguinis, H. (1995). Statistical power problems in moderated multiple regression in management research. *Journal of Management*, *21*, 1141-1158.
DOI:10.1177/014920639502100607
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage Publications.
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13*, 27-45. DOI:10.1177/1073191105283504
- Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., ... Williams, J. M. G. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment*, *15*, 329-342.
DOI:10.1177/1073191107313003
- Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders*, *34*, 163-175.
DOI:10.1023/B:JADD.0000022607.19833.00
- Bartholomew, K. (1990). Avoidance of intimacy: An attachment perspective. *Journal of Social and Personal Relationships*, *7*, 147-178. DOI:10.1177/0265407590072001
- Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology*, *61*, 226-244. DOI:10.1037/0022-3514.61.2.226

- Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological inflexibility and acceptance. *Behavior Therapy, 42*, 676-688.
- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult romantic attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46-76). New York: Guilford Press.
- Byrne, D. (1971). *The attraction paradigm*. New York: Academic Press.
- Chapman, G. B., & Johnson, E. J. (2002). Incorporating the irrelevant: Anchors in judgment of belief and value. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 120-138). Cambridge, England: Cambridge University Press.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd Ed.). Mahwah, NJ: Lawrence Earlbaum Associates.
- Davis, D. (1981). Implications for interaction versus effectance as mediators of the similarity-attraction relationship. *Journal of Experimental Social Psychology, 17*, 96-116. DOI:10.1016/0022-1031(81)90009-3
- Davis, H. L., Hoch, S. J., & Ragsdale, E. K. E. (1986). An anchoring and adjustment model of spousal predictions. *Journal of Consumer Research, 13*, 25-37.

- Davis, J. L., & Rusbult, C. E. (2001). Attitude alignment in close relationships. *Journal of Personality and Social Psychology, 81*, 65-84. DOI:10.1037//0022-3514.81.1.65
- Dinsmoor, J. A. (1995a). Stimulus control: Part I. *The Behavior Analyst, 18*, 51-68.
- Dinsmoor, J. A. (1995b). Stimulus control: Part II. *The Behavior Analyst, 18*, 253-269.
- Epley, N., & Gilovich, T. (2006). The anchoring-and-adjustment heuristic: Why the adjustments are insufficient. *Psychological Science, 17*, 311-318.
DOI:10.1111/j.1467-9280.2006.01704.x
- Epley, N., Keysar, B., Van Boven, L., & Gilovich, T. (2004). Perspective taking as egocentric anchoring and adjustment. *Journal of Personality and Social Psychology, 87*, 327-339. DOI:10.1037/0022-3514.87.3.327
- Fantino, E. (2004). Behavior-analytic approaches to decision making. *Behavioural Processes, 66*, 279-288. DOI:10.1016/j.beproc.2004.03.009
- Fantino, E., & Stolarz-Fantino, S. (2005). Decision-making: Context matters. *Behavioral Processes, 69*, 165-171. DOI:10.1016/j.beproc.2005.02.002
- Faul, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioural, and biomedical sciences. *Behavior Research Methods, 39*, 175-191. DOI:10.3758/BF0319146
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2009). Statistical power using G*Power 3.1: Test for correlation and regression analyses. *Behavior Research Methods, 41*, 1149-1160. DOI:10.3758/BRM.41.4.1149
- Fay, N., Page, A. C., Serfaty, C., Tai, V., & Winkler, C. (2008). Speaker overestimation of communication effectiveness and fear of negative evaluation: Being realistic is

unrealistic. *Psychonomic Bulletin & Review*, 15, 1160-1165.

DOI:10.3758/PBR.15.6.1160

Freud, S. (1957). Instincts and their vicissitudes. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 3, pp. 157-186). London. Hogarth Press. (Original work published 1915).

Furnham, A., & Boo, H. C. (2011). A literature review of the anchoring effect. *The Journal of Socio-Economics*, 40, 35-42. DOI:10.1016/j.socec.2010.10.008

Gagne, F. M., & Lydon, J. E. (2004). Bias and accuracy in close relationships: An integrative review. *Personality and Social Psychology Review*, 8, 322-348.

DOI:10.1207/s15327957pspr0804_1

Gill, M. J., & Swann, W. B. (2004). On what it means to know someone: A matter of pragmatics. *Journal of Personality and Social Psychology*, 86, 405-418.

DOI:10.1037/0022-3514.86.3.405

Gilovich, T., & Savitsky, K. (1999). The spotlight effect and the illusion of transparency: Egocentric assessments of how we are seen by others. *Current Directions in Psychological Science*, 8, 165-168. DOI:10.1111/1467-8721.00039

Gosselin, P., Ladouceur, R., Evers, A., Laverdiere, A., Routhier, & Tremblay-Picard, M. (2008). Evaluation of intolerance of uncertainty: Development and validation of a new self-report measure. *Journal of Anxiety Disorders*, 22, 1427-1439.

DOI:10.1016/j.janxdis.2008.02.005

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the

- difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, 26, 41-54. DOI:10.1023/B:JOBA.0000007455.08539.94
- Hayes, S. C., Barnes-Holmes, D., & Roche, B. (Eds.). (2001). *Relational frame theory: A post-Skinnerian account of human language and cognition*. New York: Kluwer Academic/Plenum Publishers.
- Hayes, S. C., & Brownstein, A. J. (1986). Mentalism, behavior-behavior relations, and a behavior-analytic view of the purposes of science. *The Behavior Analyst*, 9, 175-190.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. D. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press.
- Hayes, S. C., Wilson, K. C., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, 64, 1152-1168. DOI:10.1037/0022-006X.64.6.1152
- Hoch, S. J. (1987). Perceived consensus and predictive accuracy: The pros and cons of projection. *Journal of Personality and Social Psychology*, 53, 221-234.
DOI:10.1037/0022-3514.53.2.221
- Ickes, W., & Simpson, J. A. (1997). Managing empathic accuracy in close relationships. In W. Ickes (Ed.), *Empathic accuracy* (pp. 218-250). New York: The Guilford Press.

- Kenny, D. A., & Acitelli, L. K. (2001). Accuracy and bias in the perception of the partner in a close relationship. *Journal of Personality and Social Psychology*, *80*, 438-448. DOI:10.1037//0022-3514.80.3.439
- Keysar, B., & Henly, A. S. (2002). Speakers' overestimation of their effectiveness. *Psychological Science*, *13*, 207-212. DOI:10.1111/1467-9280.00439
- Klein (1940). Mourning and its relationship with manic-depressive states. *International Journal of Psychoanalysis*, *12*, 47-82.
- Knudson, R. M., Summers, A. A., & Golding, S. L. (1980). Interpersonal perception and mode of resolution in marital conflict. *Journal of Personality and Social Psychology*, *38*, 751-763. DOI:10.1037/0022-3514.38.5.751
- Kruger, J. (1999). Lake Wobegon be gone! The "below-average effect" and the egocentric nature of comparative ability judgments. *Journal of Personality and Social Psychology*, *77*, 221-232. DOI:10.1037/0022-3514.77.6.1121
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin*, *108*, 480-498. DOI:10.1037/0033-2909.108.3.480
- Laraway, S., Snyckerski, S., Michael, J., & Poling, A. (2003). Motivating operations and terms to describe them: Some further refinements. *Journal of Applied Behavior Analysis*, *36*, 407-414. DOI:10.1901/jaba.2003.36-407
- Lawrence, E. J., Shaw, P., Baker, D., Baron-Cohen, S., & David, A. S. (2004). Measuring empathy: Reliability and validity of the empathy quotient. *Psychological Medicine*, *34*, 911-924. DOI:10.1017/S0033291703001624

- Lerouge, D., & Warlop, L. (2006). Why it is so hard to predict our partner's product preferences: The effect of target familiarity on prediction accuracy. *Journal of Consumer Research*, *33*, 393-402.
- Levinger, G., & Breedlove, J. (1966). Interpersonal attraction and agreement: A study of marriage partners. *Journal of Personality and Social Psychology*, *3*, 367-372.
DOI:10.1037/h0023029
- Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York: Guilford Press.
- Luoma, J. B., Hayes, S. C., & Walser, R. D. (2007). *Learning ACT: An acceptance and commitment therapy skills-training manual for therapists*. Oakland, CA: New Harbinger Publications, Inc.
- MacPhillamy, D. J., & Lewinsohn, P. M. (1982). The pleasant events schedule: Studies on reliability, validity, and scale intercorrelation. *Journal of Consulting and Clinical Psychology*, *50*, 363-380. DOI:10.1037/0022-006X.50.3.363
- Mansfield, A. K., & Cordova, J. V. (2007). A behavioral perspective on adult attachment style, intimacy, and relationship health. In D. W. Woods & J. W. Kanter (Eds.), *Understanding behavior disorders* (pp. 389-416). Reno, NV: Context Press.
- Michael, J. (1982). Distinguishing between discriminative and motivational functions of stimuli. *Journal of the Experimental Analysis of Behavior*, *37*, 149-155.
DOI:10.1901/jeab.1982.37-149
- Mikulincer, M., & Horesh, N. (1999). Adult attachment style and the perception of others: The role of projective mechanisms. *Journal of Personality and Social Psychology*, *76*, 1022-1034. DOI:10.1037/0022-3514.76.6.1022

- Mikulincer, M., Orbach, I., & Iavnieli, D. (1998). *Journal of Personality and Social Psychology*, 75, 436-448. DOI:10.1037/0022-3514.75.2.436
- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change*. New York: The Guilford Press.
- Murray, S. M., Holmes, J. G., & Griffin, D. W. (1996a). The benefit of positive illusions: Idealization and the construction of satisfaction in close relationships. *Journal of Personality and Social Psychology*, 70, 79-98. DOI:10.1037/0022-3514.70.1.79
- Murray, S. M., Holmes, J. G., & Griffin, D. W. (1996b). The self-fulfilling nature of positive illusions in romantic relationships: Love is not blind, but prescient. *Journal of Personality and Social Psychology*, 71, 1155-1180. DOI:10.1037/0022-3514.71.6.1155
- Mussweiler, T., & Strack, F. (1999). Comparing is believing: A selective accessibility model of judgmental anchoring. In W. Stroebe & M. Hewstone (Eds.), *European review of social psychology* (Vol. 10, pp. 135-168). Chichester, UK: Wiley.
- Sarason, I. G., Sarason, B. R., Shearin, E. N., & Pierce, G. R. (1987). A brief measure of social support: Practical and theoretical implications. *Journal of Social and Personal Relationships*, 4, 497-510. DOI:10.1177/0265407587044007
- Schul, Y., & Vinokur, A. D. (2000). Projection in person perception among spouses as a function of the similarity of their shared experiences. *Personality and Social Psychology Bulletin*, 26, 987-1001. DOI:10.1177/01461672002610008
- Skinner, B. F. (1957). *Verbal behavior*. New York: Appleton-Century-Crofts.
- Sidman, M. (1994). *Equivalence relations and behavior: A research story*. Boston, MA: Authors Cooperative.

- Sillars, A. L. (1985). Interpersonal perception in relationships. In W. Ickes (Ed.), *Compatible and incompatible relationships* (pp. 277-305). New York: Springer-Verlag.
- Simmons, J. P., LeBoeuf, R. A., & Nelson, L. D. (2010). The effect of accuracy motivation on anchoring and adjustment: Do people adjust from provided anchors? *Journal of Personality and Social Psychology, 99*, 917-932.
DOI:10.1037/a0021540
- Simons, J. S., & Gaher, R. M. (2005). The Distress Tolerance Scale: Development and validation of a self-report measure. *Motivation and Emotion, 29*, 83-102.
DOI:10.1007/s11031-005-7955-3
- Simpson, J. A., Ickes, W., & Blackstone, T. (1995). When the head protects the heart: Empathic accuracy in dating relationships. *Journal of Personality and Social Psychology, 69*, 629-641. DOI:10.1037/0022-3514.69.4.629
- Spanier, G. B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family, 38*, 15-27.
- Strack, F., & Mussweiler, T. (1997). Explaining the enigmatic anchoring effect: Mechanisms of selective accessibility. *Journal of Personality and Social Psychology, 73*, 437-446. DOI:10.1037/0022-3514.73.3.437
- Tabachnick, B. G. & Fidell, L. S. (2013). *Using multivariate statistics* (6th Edition). Boston: Pearson.
- Tetlock, P. E., & Levi, A. (1982). Attribution bias: On the inconclusiveness of the cognition-motivation debate. *Journal of Experimental Social Psychology, 18*, 68-88. DOI:10.1016/0022-1031(82)90082-8

- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*, 1124-1131.
- Williams, K. D. (2007). Ostracism. *Annual Review of Psychology*, *58*, 425-452.
DOI:10.1146/annurev.psych.58.110405.085641
- Williams, K. D., & Jarvis, B. (2006). Cyberball: A program for use in research on interpersonal ostracism and acceptance. *Behavior Research Methods*, *38*, 174-180. DOI:10.3758/BF03192765
- Williams, K. D., Cheung, C. K. T., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the internet. *Journal of Personality and Social Psychology*, *79*, 748-762. DOI:10.1037//0022-3514.79.5.748

Appendix A

Demographic Information Form

Please respond to the following questions as honestly and accurately as possible. When multiple response options seem to apply to you, select the one that is the most relevant.

1. Age (in years): ____

2. Sex:

Male

Female

3. Sexual orientation:

Heterosexual

Gay

Lesbian

Bisexual

4. Current Relationship Status:

Single

In a committed dating relationship

Married

Separated

Divorced

Widowed

5. How happy is your current relationship? The middle response, "Happy," represents the degree of happiness of most relationships. Please select the response which best describes the degree of happiness, all things considered, of your relationship.

Extremely Unhappy

Fairly Unhappy

A Little Unhappy

Happy

Very Happy

Extremely Happy

Perfect

Appendix B

Experiences in Close Relationships Inventory (ECR)

The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. 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
Disagree Strongly			Neutral/ Mixed			Agree Strongly

- ___ 1. I prefer not to show a partner how I feel deep down.
- ___ 2. I worry about being abandoned.
- ___ 3. I am very comfortable being close to romantic partners. (reverse scored)
- ___ 4. I worry a lot about my relationships.
- ___ 5. Just when my partner starts to get close to me I find myself pulling away.
- ___ 6. I worry that romantic partners won't care about me as much as I care about them.
- ___ 7. I get uncomfortable when a romantic partner wants to be very close.
- ___ 8. I worry a fair amount about losing my partner.
- ___ 9. I don't feel comfortable opening up to romantic partners.
- ___ 10. I often wish that my partner's feelings for me were as strong as my feelings for him/her.
- ___ 11. I want to get close to my partner, but I keep pulling back.
- ___ 12. I often want to merge completely with romantic partners, and this sometimes scares them away.
- ___ 13. I am nervous when partners get too close to me.
- ___ 14. I worry about being alone.
- ___ 15. I feel comfortable sharing my private thoughts and feelings with my partner. (reverse scored)

- ___ 16. My desire to be very close sometimes scares people away.
- ___ 17. I try to avoid getting too close to my partner.
- ___ 18. I need a lot of reassurance that I am loved by my partner.
- ___ 19. I find it relatively easy to get close to my partner. (reverse scored)
- ___ 20. Sometimes I feel that I force my partners to show more feeling, more commitment.
- ___ 21. I find it difficult to allow myself to depend on romantic partners.
- ___ 22. I do not often worry about being abandoned. (reverse scored)
- ___ 23. I prefer not to be too close to romantic partners.
- ___ 24. If I can't get my partner to show interest in me, I get upset or angry.
- ___ 25. I tell my partner just about everything. (reverse scored)
- ___ 26. I find that my partner(s) don't want to get as close as I would like.
- ___ 27. I usually discuss my problems and concerns with my partner. (reverse scored)
- ___ 28. When I'm not involved in a relationship, I feel somewhat anxious and insecure.
- ___ 29. I feel comfortable depending on romantic partners. (reverse scored)
- ___ 30. I get frustrated when my partner is not around as much as I would like.
- ___ 31. I don't mind asking romantic partners for comfort, advice, or help. (reverse scored)
- ___ 32. I get frustrated if romantic partners are not available when I need them.
- ___ 33. It helps to turn to my romantic partner in times of need. (reverse scored)
- ___ 34. When romantic partners disapprove of me, I feel really bad about myself.
- ___ 35. I turn to my partner for many things, including comfort and reassurance. (reverse scored)
- ___ 36. I resent it when my partner spends time away from me.

Appendix C

Acceptance and Action Questionnaire (AAQ-II)

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1.	My painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
2.	I'm afraid of my feelings.	1	2	3	4	5	6	7
3.	I worry about not being able to control my worries and feelings.	1	2	3	4	5	6	7
4.	My painful memories prevent me from having a fulfilling life.	1	2	3	4	5	6	7
5.	Emotions cause problems in my life.	1	2	3	4	5	6	7
6.	It seems like most people are handling their lives better than I am.	1	2	3	4	5	6	7
7.	Worries get in the way of my success.	1	2	3	4	5	6	7

Appendix D

Distress Tolerance Scale (DTS)

Think of times that you feel distressed or upset. Select the item from the menu that best describes your beliefs about feeling distressed or upset.

1= Strongly agree

2= Mildly agree

3= Agree and disagree equally

4= Mildly disagree

5= Strongly disagree

___1. Feeling distressed or upset is unbearable to me. (Tolerance)

___2. When I feel distressed or upset, all I can think about is how bad I feel. (Absorption)

___3. I can't handle feeling distressed or upset. (Tolerance)

___4. My feelings of distress are so intense that they completely take over. (Absorption)

___5. There's nothing worse than feeling distressed or upset. (Tolerance)

___6. I can tolerate being distressed or upset as well as most people. (Reverse Scored; Appraisal)

___7. My feelings of distress or being upset are not acceptable. (Appraisal)

___8. I'll do anything to avoid feeling distressed or upset. (Regulation)

___9. Other people seem to be able to tolerate feeling distressed or upset better than I can. (Appraisal)

___10. Being distressed or upset is always a major ordeal for me. (Appraisal)

___11. I am ashamed of myself when I feel distressed or upset. (Appraisal)

___12. My feelings of distress or being upset scare me. (Appraisal)

___13. I'll do anything to stop feeling distressed or upset. (Regulation)

___14. When I feel distressed or upset, I must do something about it immediately. (Regulation)

___15. When I feel distressed or upset, I cannot help but concentrate on how bad the distress actually feels. (Absorption)

Appendix E

Difficulties in Emotion Regulation Scale (DERS)

How often do the following statements apply to you?

1= Almost never (0–10% of the time)

2= Sometimes (11–35% of the time)

3= About half the time (36–65% of the time)

4= Most of the time (66–90% of the time)

5= Almost always (91–100% of the time)

___ 1. I am clear about my feelings. (reverse scored)

___ 2. I pay attention to how I feel. (reverse scored)

___ 3. I experience my emotions as overwhelming and out of control.

___ 4. I have no idea how I am feeling.

___ 5. I have difficulty making sense out of my feelings.

___ 6. I am attentive to my feelings. (reverse scored)

___ 7. I know exactly how I am feeling. (reverse scored)

___ 8. I care about what I am feeling. (reverse scored)

___ 9. I am confused about how I feel.

___ 10. When I'm upset, I acknowledge my emotions. (reverse scored)

___ 11. When I'm upset, I become angry with myself for feeling that way.

___ 12. When I'm upset, I become embarrassed for feeling that way.

___ 13. When I'm upset, I have difficulty getting work done.

___ 14. When I'm upset, I become out of control.

___ 15. When I'm upset, I believe that I will remain that way for a long time.

___ 16. When I'm upset, I believe that I'll end up feeling very depressed.

- ___17. When I'm upset, I believe that my feelings are valid and important. (reverse scored)
- ___18. When I'm upset, I have difficulty focusing on other things.
- ___19. When I'm upset, I feel out of control.
- ___20. When I'm upset, I can still get things done. (reverse scored)
- ___21. When I'm upset, I feel ashamed with myself for feeling that way.
- ___22. When I'm upset, I know that I can find a way to eventually feel better. (reverse scored)
- ___23. When I'm upset, I feel like I am weak.
- ___24. When I'm upset, I feel like I can remain in control of my behaviors. (reverse scored)
- ___25. When I'm upset, I feel guilty for feeling that way.
- ___26. When I'm upset, I have difficulty concentrating.
- ___27. When I'm upset, I have difficulty controlling my behaviors.
- ___28. When I'm upset, I believe that there is nothing I can do to make myself feel better.
- ___29. When I'm upset, I become irritated with myself for feeling that way.
- ___30. When I'm upset, I start to feel very bad about myself.
- ___31. When I'm upset, I believe that wallowing in it is all I can do.
- ___32. When I'm upset, I lose control over my behaviors.
- ___33. When I'm upset, I have difficulty thinking about anything else.
- ___34. When I'm upset, I take time to figure out what I'm really feeling. (reverse scored)
- ___35. When I'm upset, it takes me a long time to feel better.
- ___36. When I'm upset, my emotions feel overwhelming.

Appendix F

Five Facet Mindfulness Questionnaire (FFMQ)

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

- 1= Never or very rarely true
- 2= Rarely true
- 3= Sometimes true
- 4= Often true
- 5= Very often or always true

- _____ 1. When I'm walking, I deliberately notice the sensations of my body moving. (observe)
- _____ 2. I'm good at finding words to describe my feelings. (describe)
- _____ 3. I criticize myself for having irrational or inappropriate emotions. (non-judging; reverse scored)
- _____ 4. I perceive my feelings and emotions without having to react to them. (non-reactivity)
- _____ 5. When I do things, my mind wanders off and I'm easily distracted. (awareness; reverse scored)
- _____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body. (observe)
- _____ 7. I can easily put my beliefs, opinions, and expectations into words. (describe)
- _____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted. (awareness; reverse scored)
- _____ 9. I watch my feelings without getting lost in them. (non-reactivity)
- _____ 10. I tell myself I shouldn't be feeling the way I'm feeling. (non-judging; reverse scored)
- _____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions. (observe)
- _____ 12. It's hard for me to find the words to describe what I'm thinking. (describe; reverse scored)

- _____ 13. I am easily distracted. (awareness; reverse scored)
- _____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way. (non-judging; reverse scored)
- _____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face. (observe)
- _____ 16. I have trouble thinking of the right words to express how I feel about things. (describe; reverse scored)
- _____ 17. I make judgments about whether my thoughts are good or bad. (non-judging; reverse scored)
- _____ 18. I find it difficult to stay focused on what's happening in the present. (awareness; reverse scored)
- _____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it. (non-reactivity)
- _____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing. (observe)
- _____ 21. In difficult situations, I can pause without immediately reacting. (non-reactivity)
- _____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words. (describe; reverse scored)
- _____ 23. It seems I am "running on automatic" without much awareness of what I'm doing. (awareness; reverse scored)
- _____ 24. When I have distressing thoughts or images, I feel calm soon after. (non-reactivity)
- _____ 25. I tell myself that I shouldn't be thinking the way I'm thinking. (non-judging; reverse scored)
- _____ 26. I notice the smells and aromas of things. (observe)
- _____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words. (describe)

_____ 28. I rush through activities without being really attentive to them. (awareness; reverse scored)

_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting. (non-reactivity)

_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them. (non-judging; reverse scored)

_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow. (observe)

_____ 32. My natural tendency is to put my experiences into words. (describe)

_____ 33. When I have distressing thoughts or images, I just notice them and let them go. (non-reactivity)

_____ 34. I do jobs or tasks automatically without being aware of what I'm doing. (awareness; reverse scored)

_____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about. (non-judging; reverse scored)

_____ 36. I pay attention to how my emotions affect my thoughts and behavior. (observe)

_____ 37. I can usually describe how I feel at the moment in considerable detail. (describe)

_____ 38. I find myself doing things without paying attention. (awareness; reverse scored)

_____ 39. I disapprove of myself when I have irrational ideas. (non-judging; reverse scored)

Appendix G

Social Support Questionnaire Satisfaction Scale (SSQSS)

The following questions ask about people in your environment who provide you with help or support. For each question, think of all of the people you know, excluding yourself, whom you can count on for help or support in the manner described. Then rate how satisfied you are with overall support that you have. If you have had no support for a question, still rate your level of satisfaction using the below scale. Please answer all the questions as best you can.

- 1= Very dissatisfied
- 2= Fairly dissatisfied
- 3= A little dissatisfied
- 4= A little satisfied
- 5= Fairly satisfied
- 6= Very satisfied

- ___1. Whom can you really count on to be dependable when you need help?
- ___2. Whom can you really count on to help you feel more relaxed when you are under pressure or tense?
- ___3. Who accepts you totally, including your worst and your best points?
- ___4. Whom can you count on to really care about you, regardless of what is happening to you?
- ___5. Whom can you really count on to help you feel better when you are feeling generally down-in-the-dumps?
- ___6. Whom can you count on to console you when you are very upset?

Appendix H

Activity Preferences Scale (APS)

Below is a list of activities. Please consider each activity and indicate how much you like or would like to engage in that activity using the following scale.

- 1= Dislike very much
- 2= Dislike somewhat
- 3= Dislike slightly
- 4= Like slightly
- 5= Like somewhat
- 6= Like very much

- ___ 1. Exercising
- ___ 2. Sleeping in or having a “lazy day”
- ___ 3. Studying
- ___ 4. Doing household tasks (cooking, cleaning, etc.)
- ___ 5. Reading, watching, or listening to the news
- ___ 6. Going out to a bar, club, etc.
- ___ 7. Having sex
- ___ 8. Going to a religious gathering
- ___ 9. Doing regular volunteer work
- ___ 10. Protesting social, political, or environmental conditions
- ___ 11. Watching television
- ___ 12. Traveling
- ___ 13. Attending a cultural event (play, concert, special museum exhibit, etc.)
- ___ 14. Outdoor activities (hiking, kayaking, skiing, etc.)
- ___ 15. Having lunch or coffee with friends or associates
- ___ 16. Going out to eat at a fancy restaurant

___17. Going to lectures or hearing speakers

___18. Hunting or fishing

___19. Doing things with children

___20. Being with pets or other animals

Appendix I

Example of APS Stimulus Material Used in Experimental Manipulations

Participant Name: Sam

Activity Preferences Scale (APS)

Below is a list of activities. Please consider each activity and indicate how much you like or would like to engage in that activity using the following scale.

- 1= Dislike very much
- 2= Dislike somewhat
- 3= Dislike slightly
- 4= Like slightly
- 5= Like somewhat
- 6= Like very much

- 2 1. Exercising
- 5 2. Sleeping in or having a "lazy day"
- 6 3. Studying
- 2 4. Doing household tasks (cooking, cleaning, etc.)
- 1 5. Reading, watching, or listening to the news
- 3 6. Going out to a bar, club, etc.
- 1 7. Having sex
- 1 8. Going to a religious gathering
- 3 9. Doing regular volunteer work
- 2 10. Protesting social, political, or environmental conditions
- 6 11. Watching television
- 5 12. Traveling
- 1 13. Attending a cultural event (play, concert, special museum exhibit, etc.)

- 1 14. Outdoor activities (hiking, kayaking, skiing, etc.)
- 3 15. Having lunch or coffee with friends or associates
- 3 16. Going out to eat at a fancy restaurant
- 1 17. Going to lectures or hearing speakers
- 4 18. Hunting or fishing
- 2 19. Doing things with children
- 6 20. Being with pets or other animals

Table 1

Summary of Mean (Standard Deviation) Response to Items Assessing Impact of Ostracism Manipulations in Present and Previous Research

	Present Study		Williams and colleagues (2000)	
	Overinclusion (<i>n</i> = 45)	Complete Ostracism (<i>n</i> = 44)	Overinclusion (<i>n</i> =372)	Complete Ostracism (<i>n</i> =335)
<i>Mood</i> *	5.20 (.991)	4.07 (1.065)	NA	NA
<i>Belong</i> *	6.93 (1.437)	2.68 (2.009)	3.09 (1.84)**	7.01 (1.97)**
<i>Meaning</i>	1.38 (1.007)	1.45 (1.170)	2.53 (2.35)	2.55 (2.28)
<i>Control</i>	6.76 (1.836)	7.16 (1.804)	3.49 (2.19)**	3.54 (2.31)**
<i>Self- esteem</i> *	5.24 (1.773)	4.02 (2.040)	4.45 (2.04)**	6.37 (2.00)**

Notes. *Mood* represents responses to a 7-point Likert-type item, “Rate your current mood.” Williams and colleagues (2000) used a different metric for measuring mood, preventing a direct comparison. *Belong* represents responses to the 9-point Likert-type item, “How much do you feel you belonged to the group?” *Meaning* represents responses to the 9-point Likert-type item, “How true is the statement: ‘Life is meaningless’?” *Control* represents responses to the 9-point Likert-type item, “How true is the statement: ‘I am in control of my life’?” *Self-esteem* represents responses to the 9-point Likert-type scale “To what extent do you think the other participants value you as a person?”

*Indicates variables significantly impacted by the ostracism manipulation in both studies.

**Indicates reverse scoring methods were used in Williams and colleagues (2000) such that the scaling is opposite to that used in the present study.

Table 2

Descriptive Statistics Summarizing Variables of Interest Included in the Final Data Analyses

	Mean	Standard Deviation	Lowest Value	Highest Value
<i>avoid</i>	53.407	19.584	18	98
<i>anxiety</i>	65.045	21.583	18	113
<i>inflexible</i>	21.449	7.681	7	41
<i>intolerance</i>	2.645	.873	1.08	4.67
<i>dysregulation</i>	79.410	21.688	42	146
<i>reactivity</i>	20.206	4.539	7	35
<i>persim</i>	67.371	14.023	43	94

Notes. $n=89$. Reported means are prior to centering of independent variables.

Table 3

Pearson's Correlations between Variables of Interest Included in the Final Data Analyses

	<i>avoid</i>	<i>anxiety</i>	<i>inflexible</i>	<i>intolerance</i>	<i>dysregulation</i>	<i>reactivity</i>
<i>avoid</i>	-					
<i>anxiety</i>	.201	-				
<i>inflexible</i>	.485**	.368**	-			
<i>intolerance</i>	.316**	.536**	.451**	-		
<i>dysregulation</i>	.251**	.540**	.627**	.700**	-	
<i>reactivity</i>	.261*	.294**	.299**	.458**	.532**	-
<i>persim</i>	.020	-.115	.007	.040	.011	.057

Notes. $n=89$. ** $p < .01$; * $p < .05$

Table 4

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 1

	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	80.305	1.083		74.142	.000
<i>avoid</i>	.063	.032	.088	1.957	.054
<i>anxiety</i>	-.063	.029	-.097	-2.161	.034
<i>ostracismeff</i>	-.705	.610	-.051	-1.156	.251
<i>ostracismeffxavoid</i>	-.059	.032	-.081	-1.831	.071
<i>ostracismeffxanxiety</i>	-.020	.029	-.031	-.699	.486
<i>similaritydum1</i>	-7.911	1.509	-.268	-5.243	.000
<i>similaritydum2</i>	-29.966	1.496	-1.024	-20.027	.000

Notes. $R^2 = .848$. $n = 89$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 5

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypotheses 2a and 2b

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	67.838	.614		110.483	.000
<i>similarity1eff</i>	4.768	.869	.276	5.488	.000
<i>similarity2eff</i>	-17.283	.860	-1.008	-20.090	.000
<i>ostracismeff</i>	-.690	.619	-.049	-1.115	.268
<i>avoid</i>	.066	.032	.092	2.018	.047
<i>anxiety</i>	-.060	.029	-.093	-2.053	.043

Notes. $R^2 = .839$. $n = 89$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 6

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypotheses 2a and 2b in the Reduced Dataset Following Elimination of Multivariate Outliers

	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	67.639	.555		121.774	.000
<i>similarity1eff</i>	5.112	.799	.294	6.400	.000
<i>similarity2eff</i>	-17.825	.780	-1.044	-22.840	.000
<i>ostracismeff</i>	-.445	.561	-.032	-.793	.430
<i>avoid</i>	.063	.031	.084	2.014	.047
<i>anxiety</i>	-.047	.027	-.072	-1.741	.086

Notes. $R^2 = .871$, $n = 84$. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 7

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 3a

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	67.716	.606		111.725	.000
<i>similarity1eff</i>	4.743	.853	.274	5.557	.000
<i>similarity2eff</i>	-17.369	.846	-1.013	-20.532	.000
<i>ostracismeff</i>	-.699	.608	-.050	-1.150	.253
<i>avoid</i>	.062	.032	.087	1.941	.056
<i>anxiety</i>	-.060	.029	-.092	-2.083	.040
<i>ostracismeffxavoid</i>	-.063	.031	-.087	-2.014	.047

Notes. $R^2 = .847$. $n = 89$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 8

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 3a in the Reduced Dataset Following Elimination of Multivariate Outliers

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	67.590	.561		120.478	.000
<i>similarity1eff</i>	5.045	.806	.290	6.259	.000
<i>similarity2eff</i>	-17.808	.783	-1.043	-22.741	.000
<i>ostracismeff</i>	-.459	.563	-.033	-.815	.418
<i>avoid</i>	.064	.032	.084	2.014	.047
<i>anxiety</i>	-.049	.027	-.075	-1.792	.077
<i>ostracismeffxavoid</i>	-.023	.030	-.030	-.741	.461

Notes. $R^2 = .879$. $n = 84$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 9

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 3b

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	67.771	.617		109.872	.000
<i>similarity1eff</i>	4.723	.869	.273	5.434	.000
<i>similarity2eff</i>	-17.249	.860	-1.006	-20.052	.000
<i>ostracismeff</i>	-.699	.618	-.050	-1.131	.261
<i>avoid</i>	.066	.032	.093	2.043	.044
<i>anxiety</i>	-.065	.030	-.100	-2.193	.031
<i>ostracismeffxanxiety</i>	-.031	.029	-.047	-1.065	.290

Notes. $R^2 = .842$. $n = 89$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 10

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 4a1

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	68.171	.693		98.417	.000
<i>similarity1eff</i>	4.702	.870	.270	5.406	.000
<i>similarity2eff</i>	-17.545	.860	-1.014	-20.396	.000
<i>ostracismeff</i>	-1.079	.694	-.077	-1.555	.124
<i>avoid</i>	.060	.037	.083	1.596	.115
<i>anxiety</i>	-.070	.031	-.106	-2.230	.029
<i>inflexible</i>	.105	.103	.057	1.021	.310
<i>ostracismeffxavoid</i>	-.083	.037	-.115	-2.250	.027
<i>ostracismeffxinflexible</i>	.036	.097	.019	.367	.715
<i>inflexiblexavoid</i>	-.005	.005	-.052	-1.069	.289
<i>ostracismeffxavoidxinflexible</i>	.009	.005	.093	1.691	.095

Notes. $R^2 = .857$. $n = 87$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 11

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 4a2

	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	67.625	.686		98.514	.000
<i>similarity1eff</i>	4.629	.948	.268	4.883	.000
<i>similarity2eff</i>	-17.163	.919	-.994	-18.677	.000
<i>ostracismeff</i>	-.736	.689	-.053	-1.068	.289
<i>avoid</i>	.067	.039	.095	1.716	.090
<i>anxiety</i>	-.064	.037	-.095	-1.748	.084
<i>inflexible</i>	.030	.109	.015	.272	.787
<i>ostracismeffxanxiety</i>	-.064	.037	-.025	-.456	.650
<i>ostracismeffxinflexible</i>	.030	.099	.015	.301	.764
<i>inflexiblexanxiety</i>	.002	.005	.029	.534	.595
<i>ostracismeffxanxietyxinflexible</i>	.003	.005	.041	.739	.463

Notes. $R^2 = .838$. $n = 86$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 12

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 4b1

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	68.107	.632		107.844	.000
<i>similarity1eff</i>	4.909	.869	.282	5.647	.000
<i>similarity2eff</i>	-17.298	.852	-1.002	-20.313	.000
<i>ostracismeff</i>	-.391	.631	-.028	-.619	.537
<i>avoid</i>	.052	.034	.072	1.535	.129
<i>anxiety</i>	-.070	.036	-.107	-1.944	.056
<i>intolerance</i>	-.205	.895	-.013	-.229	.820
<i>ostracismeffxavoid</i>	-.071	.034	-.098	-2.082	.041
<i>ostracismeffxintolerance</i>	-.632	.754	-.039	-.838	.405
<i>intolerancexavoid</i>	-.066	.035	-.086	-1.898	.061
<i>ostracismeffxavoidxintolerance</i>	-.048	.035	-.064	-1.381	.171

Notes. $R^2 = .859$. $n = 87$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 13

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 4b2

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	68.312	.756		90.411	.000
<i>similarity1eff</i>	4.908	.933	.285	5.263	.000
<i>similarity2eff</i>	-17.340	.912	-1.006	-19.018	.000
<i>ostracismeff</i>	-.758	.750	-.055	-1.010	.316
<i>avoid</i>	.059	.038	.083	1.568	.121
<i>anxiety</i>	-.060	.041	-.089	-1.459	.149
<i>intolerance</i>	-.369	1.012	-.022	-.364	.717
<i>ostracismeffxanxiety</i>	-.014	.041	-.020	-.333	.740
<i>ostracismeffxintolerance</i>	-.727	.977	-.044	-.744	.459
<i>intolerancexanxiety</i>	-.045	.041	-.059	-1.086	.281
<i>ostracismeffxanxietyxintolerance</i>	.009	.038	.014	.244	.808

Notes. $R^2 = .841$. $n = 86$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 14

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 4c1

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	68.604	.635		107.978	.000
<i>similarity1eff</i>	4.961	.856	.280	5.796	.000
<i>similarity2eff</i>	-17.546	.822	-1.023	-21.333	.000
<i>ostracismeff</i>	-.931	.631	-.066	-1.475	.145
<i>avoid</i>	.064	.034	.086	1.895	.062
<i>anxiety</i>	-.117	.034	-.175	-3.450	.001
<i>dysregulation</i>	.047	.036	.068	1.300	.198
<i>ostracismeffxavoid</i>	-.112	.034	-.150	-3.330	.001
<i>ostracismeffxdysregulation</i>	.013	.032	.018	.402	.689
<i>dysregulationxavoid</i>	-.005	.002	-.120	-2.562	.012
<i>ostracismeffxavoidxdysregulation</i>	.000	.002	-.011	-.229	.819

Notes. $R^2 = .875$. $n = 85$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 15

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 4c2

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	67.563	.743		90.936	.000
<i>similarity1eff</i>	4.851	.933	.283	5.198	.000
<i>similarity2eff</i>	-17.399	.925	-1.016	-18.800	.000
<i>ostracismeff</i>	-1.153	.739	-.082	-1.560	.123
<i>avoid</i>	.062	.038	.086	1.640	.105
<i>anxiety</i>	-.086	.041	-.126	-2.105	.039
<i>dysregulation</i>	.033	.043	.049	.774	.441
<i>ostracismeffxanxiety</i>	-.039	.040	-.058	-.978	.331
<i>ostracismeffxdysregulation</i>	.010	.039	.015	.251	.802
<i>dysregulationxanxiety</i>	.001	.002	.044	.810	.421
<i>ostracismeffxanxietyxdysregulation</i>	.002	.002	.090	1.517	.133

Notes. $R^2 = .844$, $n = 84$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 16

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 4d1

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	67.814	.632		107.243	.000
<i>similarity1eff</i>	4.905	.868	.292	5.653	.000
<i>similarity2eff</i>	-17.348	.916	-.997	-18.934	.000
<i>ostracismeff</i>	-.615	.631	-.044	-.974	.333
<i>avoid</i>	.042	.034	.057	1.212	.230
<i>anxiety</i>	-.068	.032	-.105	-2.099	.039
<i>reactivity</i>	-.166	.201	-.045	-.827	.411
<i>ostracismeffxavoid</i>	-.054	.034	-.073	-1.585	.117
<i>ostracismeffxreactivity</i>	-.414	.186	-.113	-2.221	.030
<i>reactivityxavoid</i>	-.024	.011	-.117	-2.221	.030
<i>ostracismeffxavoidxreactivity</i>	-.024	.011	-.120	-2.170	.033

Notes. $R^2 = .864$, $n = 81$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

Table 17

Results of Regression of Variable persim on Multiple Analytic Variables as a Test of Hypothesis 4d2

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	67.705	.670		101.004	.000
<i>similarity1eff</i>	4.431	.952	.254	4.655	.000
<i>similarity2eff</i>	-17.039	.916	-.995	-18.593	.000
<i>ostracismeff</i>	-1.055	.669	-.075	-1.577	.119
<i>Avoid</i>	.058	.035	.081	1.645	.104
<i>anxiety</i>	-.081	.036	-.112	-2.262	.027
<i>reactivity</i>	.219	.191	.060	1.147	.255
<i>ostracismeffxanxiety</i>	-.025	.036	-.035	-.708	.482
<i>ostracismeffxreactivity</i>	-.054	.189	-.015	-.284	.777
<i>reactivityxanxiety</i>	-.007	.012	-.035	-.631	.530
<i>ostracismeffxanxietyxreactivity</i>	.019	.011	.090	1.637	.106

Notes. $R^2 = .847$. $n = 82$. All individual variables were centered prior to calculation of variables representing interactions. Definitions of specific analytic variables are found in the manuscript pp.47-49.

		Similarity of Preferences		
		Similar Preferences	No Information	Dissimilar Preferences
Ostracism	Overinclusion	Group 1	Group 3	Group 5
	Complete Ostracism	Group 2	Group 4	Group 6

Figure 1. Diagram of the 2x3 factorial design of the experimental manipulations. *Ostracism* (two levels: Overinclusion and Complete Ostracism) is crossed with *Similarity of Preferences* (three levels: Similar Preferences, No Information, and Dissimilar Preferences). Note that there are also two measured independent variables not depicted in this diagram (*Avoidant Attachment* and *Attachment Anxiety*).

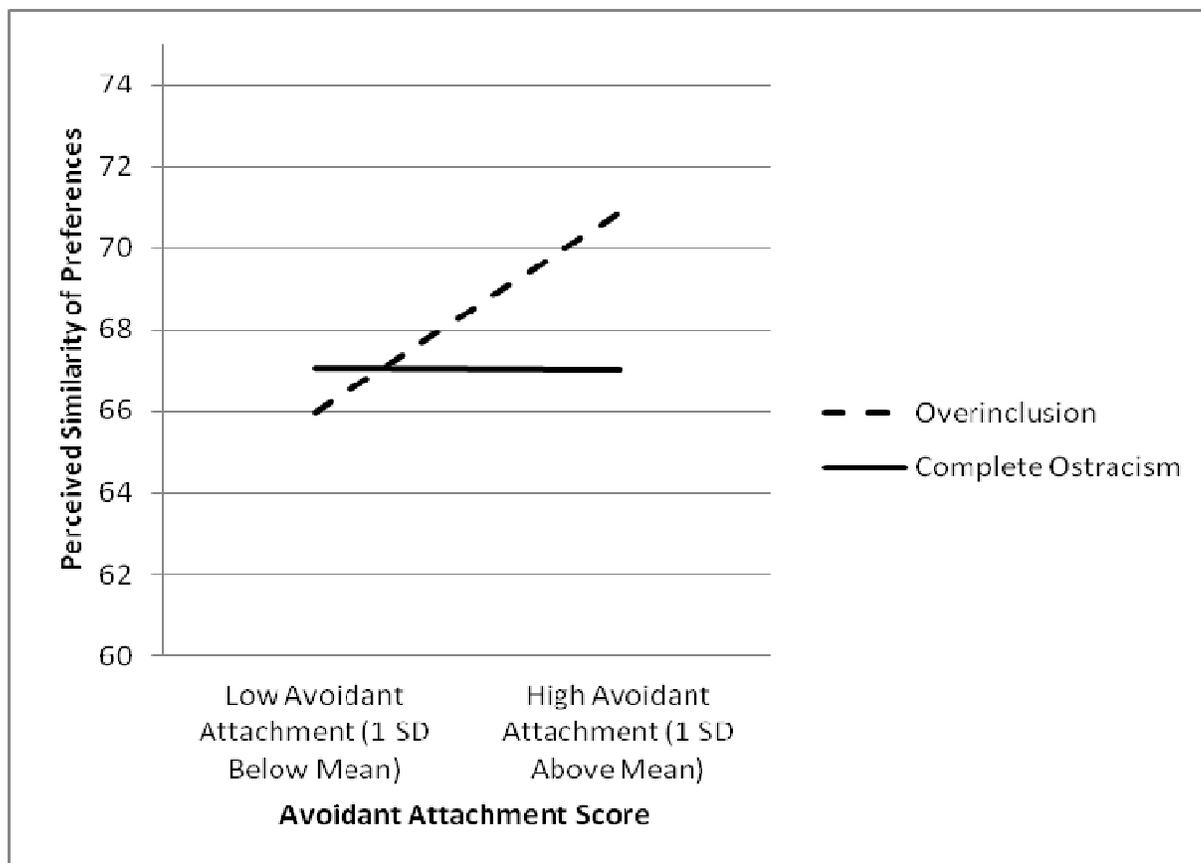


Figure 2. Plot of the lines representing the effects of the interaction between measured variable *Avoidant Attachment* (analytic variable *avoid*) and manipulation of *Ostracism* (analytic variable *ostracism*) on *Perceived Similarity* (analytic variable *persim*) in the full final dataset.

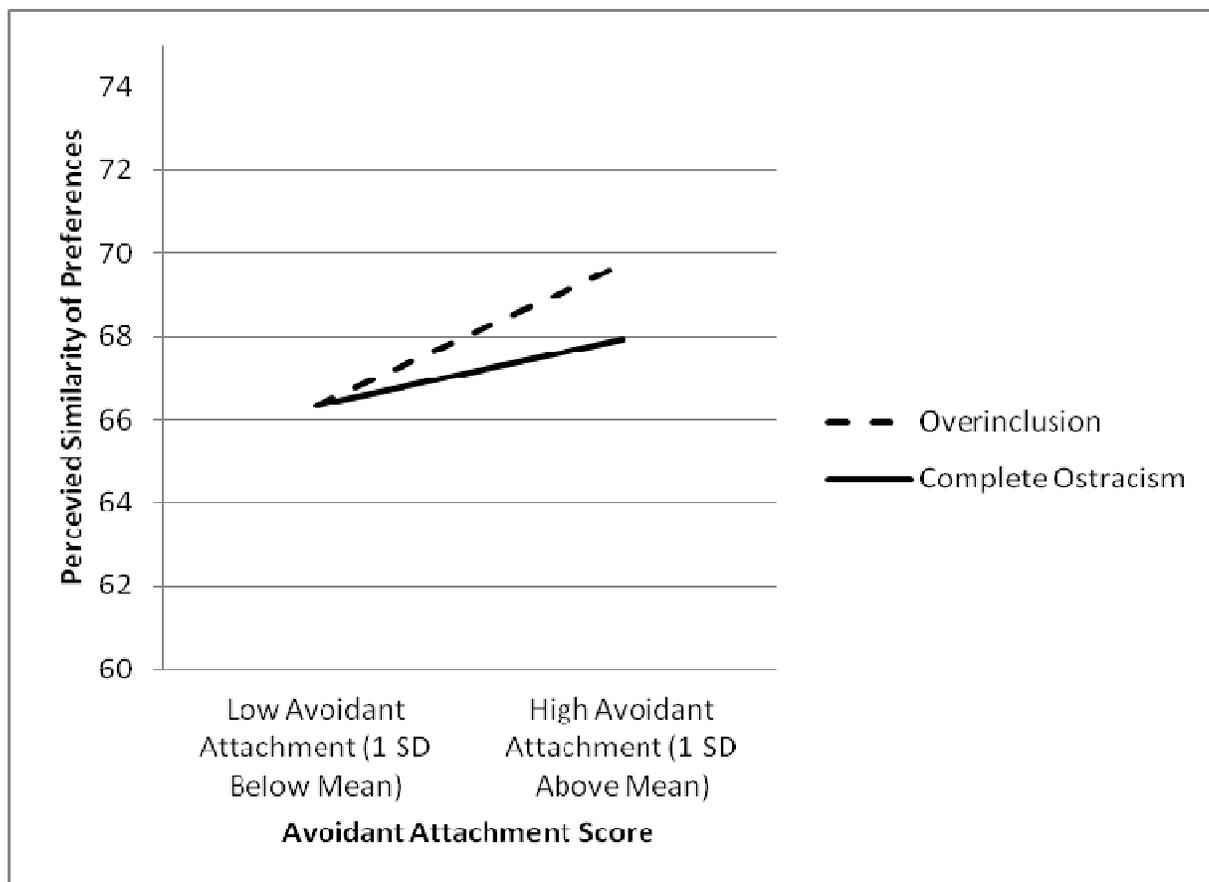


Figure 3. Plot of the lines representing the effects of the interaction between measured variable *Avoidant Attachment* (analytic variable *avoid*) and manipulation of *Ostracism* (analytic variable *ostracism*) on *Perceived Similarity* (analytic variable *persim*) in the reduced dataset (from which multivariate outliers had been eliminated).

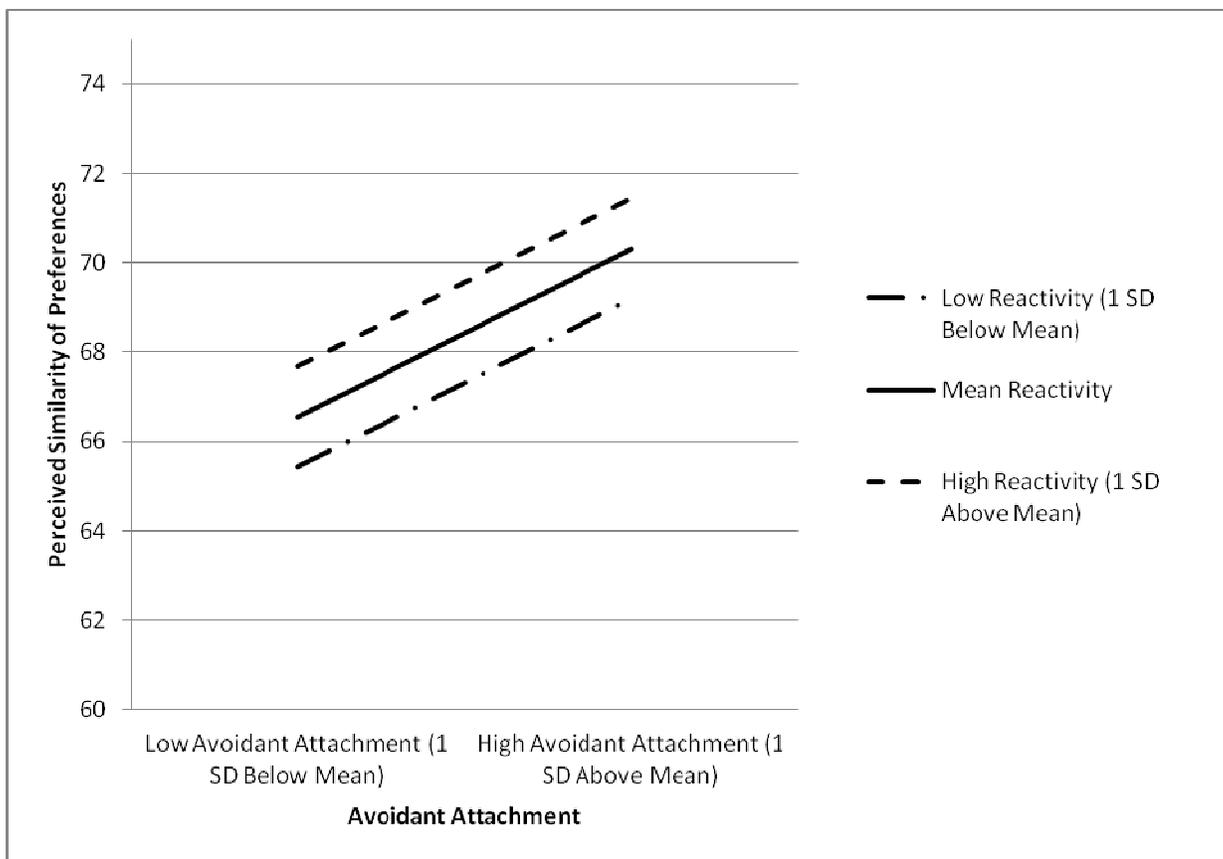


Figure 4. Plot of the lines representing the effects of the interaction between measured variable *Avoidant Attachment* (analytic variable *avoid*) and measured variable *Reactivity to Inner experiences* (analytic variable *reactivity*) on *Perceived Similarity* (analytic variable *persim*) within the overinclusion condition of manipulated variable *Ostracism* (analytic variable *ostracismeff*).

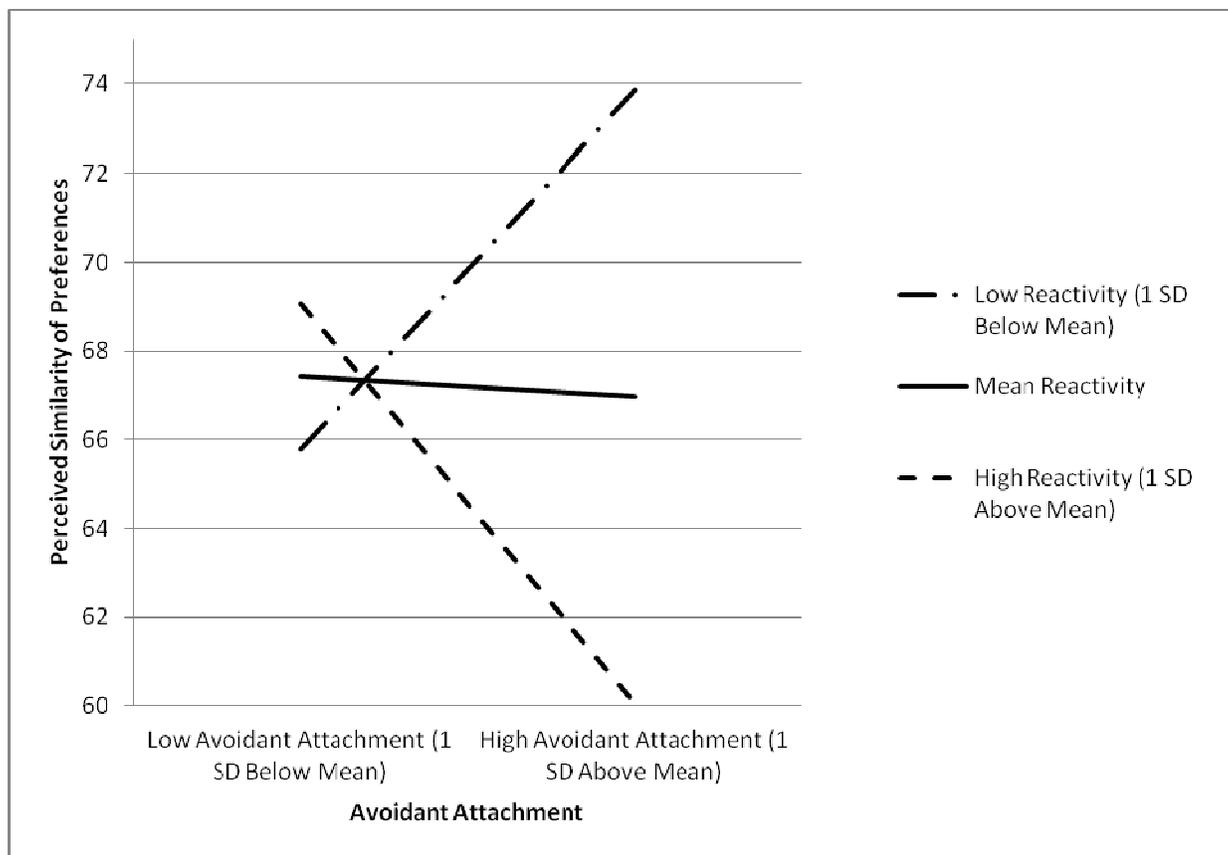


Figure 5. Plot of the lines representing the effects of the interaction between measured variable *Avoidant Attachment* (analytic variable *avoid*) and measured variable *Reactivity to Inner experiences* (analytic variable *reactivity*) on *Perceived Similarity* (analytic variable *persim*) within the complete ostracism condition of manipulated variable *Ostracism* (analytic variable *ostracismeff*).