

EXCLUSION AND NONCONSCIOUS BEHAVIORAL MIMICRY:  
THE ROLE OF BELONGINGNESS THREAT

DISSERTATION

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By

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## ABSTRACT

Human beings are social animals; the need to belong and be accepted is fundamental, and social exclusion can be devastating. It is therefore not surprising that people have developed behaviors, even automatic behaviors, which may help them to maintain relationships with important others. Research on nonconscious behavioral mimicry suggests that mimicking the nonverbal behaviors of others creates liking and rapport, and may therefore represent one way for an excluded person to affiliate with someone new. The current studies explored this hypothesis. In both experiments, participants played a simulated online ball-tossing game and were excluded by three computer-controlled players. They then completed an ostensibly unrelated task with a confederate who was not aware of the exclusion that occurred during the ball-tossing game. Experiment 1 demonstrated that people who were recently excluded from a social group mimicked the behaviors of a confederate more than people who were included in that group. Experiment 2 extended this finding by showing that, in addition to creating liking and rapport, mimicking the behaviors of others may also address threatened belongingness needs. Specifically, female participants were excluded by an all-female or all-male group and then interacted with a female or male confederate. When the female participants were excluded by an ingroup (i.e., females) and the confederate was also an ingroup member, they mimicked the behavior of that confederate more. This effect

appeared to be mediated by belongingness threat. To the extent that individuals felt that they had been excluded from the group *and* that they belonged to that group, they mimicked the ingroup confederate more. The results of these experiments suggest that mimicking the behaviors of others may be a pro-social consequence of being excluded. In addition, people may be able to regulate their group identities by affiliating through mimicry, even though mimicry happens without intention, awareness, or conscious control. This suggests that nonconsciously mimicking the behaviors of others is functional and adaptive, and furthers the perspective that the unconscious is flexible and able to adapt to new situations.

Dedicated to Nick

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## CHAPTER 1

### INTRODUCTION

Human beings are social animals (e.g., Aronson, 1999; Caporael, 2001b; Ehrlich, 2000; Wright, 1994). From dawn to dusk (and sometimes from dusk to dawn), our lives are filled with social interactions. We talk to significant others and children as we get ready for work, discuss the events of the previous evening with our co-workers, eat lunch with colleagues before meeting with others during the afternoon, and spend the evening cementing bonds with friends and family members. The number of social interactions that most individuals have on a daily basis – ranging from the superficial to the profound – is extraordinary. It is therefore not surprising that the need to belong and be accepted by family members, acquaintances, friends, peers, colleagues, and other important group members is strong, perhaps even fundamental (Baumeister & Leary, 1995). The reverse of this argument is also true – social exclusion can be devastating (Williams, 1997). Indeed, there are several large psychological literatures detailing the importance of the need to belong and be included, as well as the deleterious emotional, psychological, and behavioral consequences of having these desires thwarted. However, one of the most interesting aspects of these literatures is that specific behaviors that would help people to address their unfulfilled need to belong are rarely discussed. Recent research on

nonconscious behavioral mimicry (e.g., Chartrand & Bargh, 1999; Lakin & Chartrand, 2003) suggests that mimicking the nonverbal behaviors of others creates liking and rapport, and may therefore represent one way for an excluded person to affiliate with someone new. If the person to be mimicked is a representative member of the group from which the person was excluded, mimicking this person's behaviors may also serve to address the threatened belongingness need of the excluded person.

I begin by reviewing the evidence for the importance of the desire to belong and be accepted (including evidence for the negative psychological, emotional, and behavioral consequences of not meeting this need). This section is followed by a review of the evidence suggesting that nonconsciously mimicking the behaviors of an interaction partner creates liking and rapport, and may therefore be one potential way to address threatened belongingness needs. Two empirical tests of the relationship between exclusion, belongingness needs, and mimicry are then detailed.

## 1.1 Evidence for the Importance of Belonging

The psychological literature is replete with examples of the importance of belonging and being accepted by significant others. There are several related literatures that suggest the importance of this desire.

### 1.1.1 Need to Belong

In a recent review paper, Baumeister and Leary (1995; see also Leary & Baumeister, 2000) argued that the need to belong, or the need to form and maintain strong, stable interpersonal relationships, is a fundamental human motivation. According to their analysis, among other characteristics, a fundamental motivation should 1) be

universal, 2) function in a wide variety of situations, 3) be associated with specific affective, cognitive, and behavioral patterns, and 4) lead to deleterious consequences when impeded. They then argue that the need to belong fulfills these criteria.

Specifically, the need to belong seems to be present in all humans in all cultures (at least to some degree), and may even have an evolutionary basis (an issue discussed in more detail below). People also form social bonds in a wide variety of situations relatively easily, and are reluctant to break those bonds once they have been formed. At an affective level, increases in belongingness are related to positive affect, and decreases in belongingness are related to negative affect. The need to belong also affects cognition, as people devote a considerable amount of time to processing and understanding interpersonal information. Finally, at the behavioral level, the absence of meaningful personal relationships leads to an increase in affiliative behaviors, such as agreeing with another person's decision and engaging in negative behaviors sanctioned by group members.

There is no dearth of anecdotal or empirical evidence suggesting that lack of belongingness causes adverse emotional and psychological effects. Evidence reviewed by Baumeister and Leary (1995) is consistent with this argument. The threat of losing important social relationships results in anxiety and jealousy, and actual loss of these relationships may result in depression and loneliness. People who are deprived of belongingness also experience greater stress, more physical and mental health problems (e.g., sickness and psychopathology), and decreases in general well-being and happiness.

As a whole, Baumeister and Leary's (1995) summary of the evidence related to the need to belong is quite convincing. It seems clear that there is a universal desire to develop and maintain stable, fulfilling interpersonal relationships.

Subsequent research has led to the development of an individual difference measure of the need to belong (Leary, Kelly, Cottrell, & Schreindorfer, 2003). The scale contains 10-items (e.g., "I try hard not to do things that will make other people avoid or reject me" and "It bothers me a great deal when I am not included in other people's plans") and appears to have adequate reliability and validity. Consistent with Baumeister and Leary's (1995) review, research using this scale demonstrates that people who score high on a chronic measure of the need to belong are more motivated to pursue belongingness needs than people who score low. For example, people who are high in the need to belong are more able to detect the emotions depicted in a series of faces, suggesting that they are more sensitive to visual social cues (Pickett, Gardner, & Knowles, 2003).

### 1.1.2 Evolutionary Psychology

The universality of a motivation like the need to belong suggests that it might have an evolutionary basis. According to most evolutionary psychology perspectives, our ancestors lived in an environment in which individuals who were on their own were not always able to survive and successfully reproduce (Buss & Kenrick, 1998; Johanson & Edgar, 1996). The environment of evolutionary adaptation was complex and difficult to navigate, and individuals were forced to rely on others to complete necessary survival activities (e.g., locating and securing food sources and shelter, defending against

predators, finding mates and raising offspring). The groups in which most early humans began to live (which probably ranged in size from 2 to 200 individuals) became the locus of many of these important biological activities (Lewin, 1993; Poirier & McKee, 1999). In evolutionary terms, group living, which included helping kin (inclusive fitness; Hamilton, 1964; Dawkins, 1982) and non-kin (reciprocal altruism; Axelrod & Hamilton, 1981; Trivers, 1971) may have become the most influential factor in an individual's ability to survive and reproduce (Brewer, 1997; Caporael & Brewer, 1991). Individuals who were able to cooperate successfully with others and maintain harmonious group relationships were more likely to continue to be included in the group and were therefore able to accomplish survival activities (de Waal, 1989). In other words, individuals who were excluded from the group were less likely to survive, and individuals who were able to maintain successful group relationships were at an evolutionary advantage (Brewer, 1997; Caporael, 1997, 2001a, 2001b; Lewin, 1993; Poirier & McKee, 1999). The evolutionary advantages associated with being included in a group might therefore explain why people try to avoid being excluded by other people and have developed a need to belong.

### 1.1.3 Social Exclusion

The deleterious emotional, psychological, and behavioral consequences of not satisfying the need to belong are typically explored through the use of two different paradigms. One paradigm involves identifying people who claim to be lonely or have been excluded and then examining theoretically-related variables. Research using this paradigm has shown that anxiety, jealousy, depression, and hurt feelings occur because of

actual or threatened exclusion from important social groups (Baumeister & Tice, 1990; Leary, 1990, Leary & MacDonald, 2003).

Leary and his colleagues have utilized a slight variation of this paradigm to find support for their sociometer hypothesis (Leary & Baumeister, 2000; Leary, Tambor, Terdal, & Downs, 1995). According to the sociometer hypothesis, a self-esteem system exists in humans in order to inform people about potential social exclusion. Therefore, self-esteem should be affected by threats of social exclusion; when exclusion occurs (or the threat of exclusion is present), self-esteem should decrease, which will motivate people to behave in ways to reduce or eliminate the threat of exclusion. In an initial test of this model, Leary and his colleagues (Leary et al., 1995; Study 1) demonstrated that the effects of specific behaviors (e.g., cheating on a final exam, volunteering to donate blood) on participants' state self-esteem depended on whether they thought engaging in the behaviors would lead others to accept or reject them. A follow-up study also revealed that trait self-esteem predicts the extent to which people feel that they are socially included or excluded; the more excluded people feel, the lower their self-esteem (Leary et al., 1995; Study 5).

A second paradigm to study the consequences of social exclusion, used more frequently, involves excluding participants from a relevant group and then examining the emotional, psychological, and behavioral consequences. Research utilizing this paradigm also suggests that exclusion has a number of negative consequences. Being excluded causes a decrease in state self-esteem, especially when the exclusion is a result of group choice rather than random factors (Leary, Cottrell, & Phillips, 2001; Leary et al., 1995,

Studies 3 & 4). Moreover, this decrease in self-esteem occurs for people who acknowledge being affected by the social evaluations of others, as well as those who deny that their self-evaluations are affected by others' opinions (Leary, Gallagher, et al., 2003). This research provides additional evidence for the strength of the need to belong; it is so strong that it even affects people who publicly claim to be unaffected.

Being rejected or excluded also increases sensitivity to social information. Compared to people who have been accepted by a group, excluded people show an increase in memory for social information (Gardner, Pickett, & Brewer, 2000). People who are rejected (or are asked to re-live a time when they were rejected) are also more sensitive to emotional vocal tone and are more accurate on a facial emotion detection task (Pickett et al., 2003). These types of responses to rejection could be adaptive if they help the excluded person to avoid future rejection.

The experimental paradigm has also revealed a number of behavioral consequences of actual or implied social exclusion. Exclusion lowers performance on cognitively complex intellectual tasks, such as I.Q. tests and difficult questions from the Graduate Record Exam (but does not affect simple information processing performance, such as recalling nonsense syllables; Baumeister, Twenge, & Nuss, 2002). In addition, exclusion causes people to behave more aggressively (Twenge, Baumeister, Tice, & Stucke, 2001) and leads to derogation of the rejecters (Bourgeois & Leary, 2001). Finally, Twenge and her colleagues have also shown that threatened exclusion increases unintentionally self-defeating behaviors (Twenge, Catanese, & Baumeister, 2002). For example, participants who were told that they were likely to end up alone later in life

chose to play a long-shot lottery rather than a safer one, engaged in less healthy behaviors (e.g., reading entertainment magazines as opposed to completing a health questionnaire and receiving feedback), and procrastinated before an upcoming test.

#### 1.1.4 Ostracism

Models of ostracism (one type of social exclusion) also indicate the importance of being acknowledged and accepted by others (Williams, 1997; 2001). Williams argues that ostracism is one of the most pervasive forms of social punishment in humans, and reviews evidence that ostracism is used in other species as well (e.g., chimpanzees; Goodall, 1986). His model details both the antecedents and consequences of ostracism, although to date, little research has focused on the antecedents.

In terms of the consequences, Williams argues that being ostracized threatens four basic needs: belongingness, self-esteem, control, and meaningful existence (Sommer, Williams, Ciarocco, & Baumeister, 2001; Williams, Shore, & Grahe, 1998). A sense of belongingness is threatened because ostracism makes people feel unattached to important others, and implies that they are at risk of losing attachments to these others or the groups to which they belong. Because most people have high self-evaluations, ostracism also threatens self-esteem by implying that something about them is bad, negative, or unwanted. Control is threatened because ostracism involves a “unilateral stance” by one person or group over another. In verbal or physical aggression, the involved parties both contribute to the exchange, allowing each some control over what happens. When people are ostracized, the ostracizer is the only person who has control over the situation; no matter what the ostracized people do, they are not acknowledged. Finally, meaningful

existence is threatened when ostracism occurs because ostracism involves a withdrawal of attention from or recognition by other people. Thus, excluded people are forced to acknowledge what life would be like if they no longer existed.

To the extent that failure to fulfill these basic needs is aversive, people should actively try to accomplish them when they have been ostracized (Williams, 2001). Empirical evidence is consistent with this argument. For example, participants who were ostracized in a first experiment were more likely to exert control over a partner in a second experiment (Williams, 1993, as cited in Williams, 1997).

For the present purposes, evidence that participants engage in affiliative behaviors to address their threatened belongingness needs after being ostracized is the most relevant. Williams and Sommer (1997) demonstrated that social loafing effects are not found after some participants have been ostracized; ostracized female participants were more likely than non-ostracized females to contribute to a group task, even when their contributions would not be individually identifiable. The authors argue that females are particularly concerned with maintaining group harmony, so, when ostracized, they attempt to create this desired state by working extra hard. Consistent with this research, Williams, Cheung, and Choi (2000) found that participants who were ostracized while playing an online ball-tossing game were more likely to conform on a subsequent Asch line-judging task. The authors predicted that conformity would be most likely to occur in this condition, because agreeing with a group norm, even if it is incorrect, would be one strategy to affiliate with group members, thereby creating a smooth interaction and potentially addressing threatened belongingness needs.

### 1.1.5 Summary

There is no debate about the fact that being included in social groups is important, and that being excluded from social groups has adverse emotional, psychological, and behavioral consequences. Research on the need to belong suggests that it is a fundamental human motivation, and evolutionary psychology theorizing about the nature of groups in the evolutionary environment is consistent with this argument. Moreover, research on social exclusion and ostracism suggests that exclusion results in intense negative affect, decreases in self-esteem, and negative interpersonal behaviors. For example, Baumeister, Twenge, and their colleagues have demonstrated that aggressive and self-defeating behaviors result from threats of exclusion. However, these behaviors do not represent attempts by the excluded people to re-establish themselves with significant others. That is, these negative behaviors will not help the excluded individuals fulfill their need to belong or be accepted.

Williams et al. (2000) have demonstrated one behavioral consequence of being excluded that may help to fulfill the excluded person's desire to belong and be accepted – conformity. People who had recently been ostracized were more likely to agree with incorrect group judgments on a subsequent task. These results suggest that excluded people are willing to engage in behaviors that increase their likelihood of being accepted by a group, which leaves open the possibility that they might also engage in other behaviors (perhaps even automatic, nonconscious behaviors) that are related to the development of rapport and liking. It also remains to be seen whether these behaviors

always occur after exclusion, or whether they would be especially likely to occur in situations where threatened belongingness needs can be directly addressed.

## 1.2 Nonconscious Behavioral Mimicry

Nonconscious behavioral mimicry occurs when an individual unwittingly imitates the mannerisms or behaviors of another person (Chartrand & Bargh, 1999; Chartrand & Jefferis, in press; Chartrand, Maddux, & Lakin, in press; Lakin, Jefferis, Cheng, & Chartrand, 2003). The idea of behavior matching has a long history in the field of psychology (e.g., James, 1890), but empirical evidence for the phenomenon did not become widespread until relatively recently.

### 1.2.1 Evidence for the Occurrence of Behavioral Mimicry

There is a plethora of anecdotal evidence that behavioral mimicry exists (e.g., yawning when other people yawn). Yet many of the early researchers in this area were more concerned with demonstrating the link between posture sharing (one type of behavioral mimicry) and rapport than demonstrating the frequency with which behavioral mimicry occurred (the relationship between posture sharing and rapport is discussed in the next section). Nevertheless, with the resurgence of interest in this topic, empirical demonstrations of behavior matching have become common. A few examples are reviewed below.

The first clear experimental evidence for behavior matching was obtained by Bernieri, Reznick, & Rosenthal (1988). They recorded mother-child interactions with separate cameras, and then created several different versions of the interactions, all with the mother on the right side of the screen and the child on the left. One version showed

the true, real-time mother-child interaction, while other versions varied the mothers and children paired together, as well as the exact timing of the interactions. As a result, participant “judges” were unable to tell whether mothers were interacting with their own children or other peoples’ children. However, analyses indicated that even under these carefully controlled conditions, judges rated mothers as more physically in sync with their own children than with other children. Bernieri (1988) replicated this effect using a teacher-student paradigm.

People also mimic a variety of idiosyncratic behaviors. An experiment demonstrating this was conducted by Bavelas and her colleagues (Bavelas, Black, Chovil, Lemery, & Mullett, 1988). An experimenter told a story to a class about attending a crowded Christmas party, and described ducking to avoid being run into by another person. As she was telling the story, she ducked to her right, demonstrating the exact movement she used. A videotape of the listeners later revealed that as this event was being described, the listeners tended to duck to their left, mirroring the exact movement of the storyteller. In another line of research, almost all participants who witnessed an experimenter experience an apparently painful injury displayed some expression of pain (Bavelas, Black, Lemery, & Mullett, 1986), even though the duration of the expression was affected by whether the experimenter was making eye contact with the participant.

These studies clearly demonstrate that we mimic the behaviors of those we care about (or with whom there is an ongoing relationship) and those we might want to like us. But there is also experimental evidence that people mimic the mannerisms of complete strangers, even in situations where it is unlikely that there is pre-existing

rapport or a goal to develop future rapport. In one test of this idea, Chartrand and Bargh (1999) had participants interact with two unfamiliar confederates. Several steps were taken to ensure that rapport would not develop between the participant and confederates. The confederates were told not to make eye contact with or smile at the participant at any point during the session. The brief sessions (approximately five minutes) and mundane task (describing photographs) made this fairly easy to do. Secondly, one of the two confederates was told to have a rather negative, bored, and sullen expression throughout the interaction with the participant. It was assumed that if the default tendency was to try to affiliate with the confederate and create a sense of rapport, this tendency would be overridden or cut off by the presence of the nasty confederate. Thus, particularly with this confederate, there was little chance that rapport would develop, or that the goal to develop rapport would be present. The question then became, would behavioral mimicry occur in spite of this?

For half the participants, the first confederate rubbed her face and the second confederate shook her foot throughout their respective sessions. For the other half, the first confederate shook her foot and the second confederate rubbed her face. Results revealed that participants mimicked the mannerisms of the confederates – they shook their foot more when they were with the foot-shaker than when they were with the face-rubber, and rubbed their face more when they were with the face-rubber than when they were with the foot-shaker. At the conclusion of the experiment, participants were asked about the mannerisms of the confederate, and about their own mannerisms, and none noticed either.

The fact that participants changed their own behavior to match their environment speaks to the chameleon-like nature of mimicry behavior. Like a chameleon that changes its colors to blend or fit in with its environment, people often unwittingly change their mannerisms and behaviors to blend and fit in with their social environments. Importantly, in the Chartrand and Bargh (1999) study, even the unlikable confederate was significantly mimicked by the participant, indicating that even under minimal conditions in which there is no rapport, affiliation, or liking between interactants, behavioral mimicry still occurs.

### 1.2.2 Bi-directional Relationship between Mimicry and Rapport

Despite the fact that mimicry can and does occur under minimal conditions, the early work in this area tended to focus on posture sharing as a potential nonverbal indicator of rapport (for a review, see Tickle-Degnen & Rosenthal, 1987). In 1964, Schefflen noted that body positioning in an ongoing interaction seemed to be an indicator of liking, understanding, and the relationships between group members. Specifically, he posited that people often adopt similar postures, and that those who share similar postures often share viewpoints as well. Charney (1966) tested Schefflen's notions in a psychotherapy context and found an association between posture sharing and positive, interpersonal speech content. These researchers foreshadowed the argument later made by Bavelas and her colleagues (e.g., Bavelas et al., 1986) that behavior matching is a tool used to communicate liking for and rapport with other people.

Subsequent research also demonstrated that posture sharing was indicative of involvement and interest in an interaction, and feelings of togetherness. Bernieri (1988)

analyzed videotapes of teacher-student dyads and found that the couples whose movements were most in sync with each other also felt the most rapport. La France and her colleagues have used college classrooms to study the relationship between posture sharing and rapport. In a typical study, students were asked to report the level of rapport in their classes, and those classes were then coded for amount of posture sharing. As predicted, classes rated by students as having high rapport also manifested the greatest amount of posture sharing (La France & Broadbent, 1976; see also La France, 1982).

Because these researchers suggest that posture sharing is an indicator of rapport, they seem to be arguing that the causal path proceeds from rapport to mimicry: as rapport between interaction partners increases, people adopt the postures and mannerisms of their interaction partners to a greater extent. However, the correlational nature of these studies makes the causal direction unclear; the posture sharing and behavioral mimicry could just as easily have led to the increased rapport.

At least one study has attempted to determine the direction of causality between posture sharing and rapport through statistical techniques. Using a cross-lag panel design, La France (1979) measured posture sharing and rapport at two points in time. Not surprisingly, a positive correlation was found between posture sharing and rapport during each of the observational sessions. Moreover, the correlation between posture sharing at time one and rapport at time two ( $r = .77$ ) was greater than the correlation between rapport at time one and posture sharing at time two ( $r = .58$ ). These correlations suggest that causal priority can be given to posture sharing; however, the difference between the two correlations is not statistically significant, indicating that the causal path between

posture sharing and rapport is bi-directional. Posture sharing increases rapport (La France, 1979), but rapport also increases posture sharing, as earlier work suggested (Charney, 1966; La France & Broadbent, 1976; Schefflen, 1964).

Although the cross-lag panel technique hints at a bi-directional causal relationship between rapport and mimicry, to truly know whether one can cause the other, one factor needs to be manipulated directly. Several early studies took this approach. Dabbs (1969) had a confederate interviewee mimic the gestures of one of two participant interviewers who were in the room at the same time. Participants who were mimicked did not report more liking for the confederate, but they did evaluate the confederate more favorably than participants who were not mimicked (e.g., they said the confederate was well-informed and had sound ideas). Mimicked participants also thought that they were more similar to the confederate (e.g., they believed that the confederate thought more like they did), and similarity has been shown to increase liking and attraction (Byrne, 1971). Maurer and Tindall (1983) also experimentally explored the link between behavioral mimicry and rapport by having counselors mimic the body positions of their clients. Under these conditions, clients perceived a greater level of empathy from the counselor.

Chartrand and Bargh (1999, Study 2) also experimentally manipulated behavioral mimicry to explore the consequences for liking. They argued that perception of another's behavior automatically causes nonconscious mimicry, which in turn creates shared feelings of empathy and rapport. In their study, participants engaged in a photo-description task with a confederate. Throughout the interaction, the confederate either mimicked the behavior of the participant, or had neutral, nondescript posture and

mannerisms. It was expected that when the confederate mimicked the behavior of the participant, the participant would report liking the confederate more, and also report that the interaction had been more smooth and harmonious. Results were as predicted, suggesting that one function that behavioral mimicry serves is to increase liking between interactants. This study also provides an experimental demonstration that behavioral mimicry *causes* an increase in rapport. Thus, mimicry serves the adaptive function of increasing liking and rapport between people involved in an interaction, as well as making the interaction smoother and more harmonious.

### 1.3 Link between Exclusion and Behavioral Mimicry

Nonconscious behavioral mimicry has been explained by the existence of a perception-behavior link (Chartrand & Bargh, 1999; Dijksterhuis & Bargh, 2001; Dijksterhuis, Bargh, & Miedema, 2000); seeing a person engage in a behavior activates that behavioral representation, which then makes the perceiver more likely to engage in that behavior herself (James, 1890). Although the perception-behavior link provides one explanation for the occurrence of mimicry behavior (one for which there is much evidence; see Dijksterhuis & Bargh, 2001 or Dijksterhuis, 2001), its existence does not preclude the existence of other factors that also affect the likelihood of observing behavioral mimicry effects (e.g., self-construals - van Baaren, Maddux, Chartrand, de Bouter, & van Knippenberg, 2003; for a review, see Chartrand et al., in press).

One such factor was explored by Lakin and Chartrand (2003). Because of the link between mimicry and rapport (detailed in the previous section), we argued that a goal to affiliate with another person should reliably increase mimicry behavior. That is,

behavioral mimicry would be observed in all conditions (because of the perception-behavior link), but having an active affiliation goal should further increase this tendency. The results supported this assertion. Participants who were given a conscious or a nonconscious affiliation goal were more likely than participants who did not have an affiliation goal to mimic the behaviors of a potential interaction partner (Lakin & Chartrand, 2003; Study 1). In addition, participants who were primed with an affiliation goal and were not able to accomplish this goal in a first interaction (i.e., they failed at their goal) mimicked the behaviors of a second interaction partner more than participants who did not have an affiliation goal or participants who had an affiliation goal and succeeded in a first interaction (Lakin & Chartrand, 2003, Study 2). Presumably, participants who failed in a first attempt to achieve their goal continued to pursue their active goal with a new interaction partner.

The Lakin and Chartrand (2003) studies suggest something interesting about nonconscious behavioral mimicry. Even though the behavioral mimicry of participants occurred without conscious intention or awareness, it was witnessed more frequently in situations where it was beneficial to participants. Participants who wanted to affiliate (even when this goal was outside of awareness) mimicked more than people who did not want to affiliate. This suggests that behavioral mimicry may be functional in that doing it helps people to accomplish their objectives; in situations where people want to create liking or rapport, they mimic more.

The current studies explore whether a recent social exclusion experience may be another factor that increases nonconscious behavioral mimicry. Because exclusion is a

negative experience for most people, they should be motivated to engage in behaviors that will help them recover from this negative state. To the extent that behavioral mimicry satisfies this objective, people who are excluded from a social group should mimic the behaviors of a subsequent interaction partner more than people who are included in a social group. This pattern might be particularly likely when people are excluded from an ingroup and later have the opportunity to mimic the behaviors of a representative member of that ingroup.

## CHAPTER 2

### EXPERIMENT 1: MIMICRY AND EXCLUSION

Participants were randomly assigned to be excluded or included while playing an online ball-tossing game (called Cyberball) with three computer-controlled participants. After this experience, they were video-recorded while interacting with a confederate who was shaking her foot. These recordings were coded to determine the extent to which participants shook their own feet (i.e., mimicked the behaviors of the confederate).

#### 2.1 Hypotheses

Participants who are excluded should spend a greater proportion of time mimicking the confederate than participants who are included. Support for this hypothesis would indicate that after exclusion, people attempt to address their threatened belongingness needs by mimicking the behaviors of a new interaction partner. These results would be particularly interesting since people should not consciously intend or be aware of their mimicry behavior.

#### 2.2 Method

##### 2.2.1 Participants

Forty introductory psychology students (15 males and 25 females) participated in exchange for course credit.

### 2.2.2 Procedure

Participants were recruited for an experiment on visualization and description. Participants were met by a female experimenter at a designated waiting area and were led to the experimental room. The experimenter then explained that participants would be completing two separate experiments within the session: one on personality factors that affect mental visualization and one on describing a set of novel photographs. The experimenter then elaborated on the first experiment.

Participants were seated in front of a computer and were told that they would be playing an online ball-tossing game called Cyberball with three other participants. In reality, participants completed the experiment individually and the other players in the Cyberball game were computer-controlled. Participants were instructed, both verbally and visually, to toss the ball to one of the three other participants (identified by their initials) whenever they personally received it. The experimenter explained that the primary goal of the exercise was to give participants a chance to use their mental visualization abilities. That is, their goal while playing the ball game was to mentally visualize the other players and the situation in which the game was being played. Participants were also told that upon completion of the game, the experimenter would have a questionnaire for them to complete asking them about their mental visualization experience. After giving participants detailed instructions on how to play the game and asking if they had any questions, the experimenter instructed participants to begin and left the room.

The Cyberball game is actually a computer program (i.e., there are no other “participants”) that can be programmed to include or exclude participants (Williams et al., 2000; the program is available from <http://www.psy.mq.edu.au/staff/kip/cyberball.htm>). The game was programmed to contain 40 tosses of the ball. In the inclusion condition, participants received the ball as often as the three other players. In the exclusion condition, participants received the ball four times at the beginning of the game, but then never received the ball again. Participants saw no identifying information about the other players (except for their initials), and therefore knew nothing about the people who were ostensibly playing the game with them.

After several minutes elapsed, the experimenter re-entered the room and gave participants a questionnaire to complete. To be consistent with the cover story, participants were asked to describe what they were visualizing while playing Cyberball, as well as how easy or difficult they thought the visualization experience was for themselves and others. The questionnaire also contained several manipulation check items, including items measuring positive (happy, cheerful, excited, enthusiastic, and determined) and negative (sad, angry, lonely, displeased, and nervous) feelings, an item measuring enjoyment of the Cyberball game, and items asking how friendly, sociable, and likeable the other Cyberball players were. The final question on the questionnaire was an open-ended item assessing suspicion about the Cyberball game and/or the other players. The complete scale can be found in Appendix A.

Once participants completed the manipulation check questionnaire, the experimenter re-entered the room, took the completed questionnaire from the participant, and asked the participant to move to a chair away from the computer so that the second experiment could begin. Although there were two chairs available (separated by a small table), the experimenter blocked one of the chairs so that participants would be forced to sit in the chair facing a camera on the opposite wall that was disguised as a stereo speaker. The experimenter then told participants that they would be describing a set of photographs to a partner for the second experiment, but that their partner had not played Cyberball (and therefore knew nothing about the earlier inclusion or exclusion experience) and had not yet arrived. The experimenter then asked participants to wait for a few minutes while she went to retrieve the other “participant.” The experimenter then left the room and entered the control room next door. To obtain a baseline measure of participants’ habitual foot shaking, the experimenter recorded participants for one minute.

After one minute had elapsed, the experimenter re-entered the experimental room with a female confederate. The confederate took her seat in the empty chair, which was at a ninety-degree angle to the participant’s chair. Prior to the experimental sessions, the confederates were both trained on how to engage in the foot-shaking behavior. They sat with their left leg crossed over their right leg, and slowly and steadily shook their hanging left foot (the foot closest to the participant). The foot-shaking behavior was continuous for the duration of the interaction with the participant.

The experimenter then explained the procedures for the photo description task. Two sets of four laminated photographs were placed face down on the table between the

participant and the confederate. The photographs were taken from *Time* and *Life* magazines and included a range of scenes that varied in emotional content, ambiguity, and action. Participants were told that they were to describe what they saw in their stack of photographs to their partner without showing their partner the actual picture. Each picture was to be described for approximately 30 to 45 seconds, and the participant and confederate would alternate turns. The confederate always went first (by request of the experimenter), and followed a memorized script to ensure that her responses were standardized across participants. Before leaving the room, the experimenter said that there would be a questionnaire to complete when the task was over, and asked the confederate to open the door to the experimental room when all eight pictures had been described. The experimenter then asked the confederate to begin, and left the experimental room to start the video equipment.

After all the pictures were described, the experimenter escorted the confederate out of the experimental room, and gave participants a questionnaire to complete. Participants again rated positive and negative affect (the same items as before), their enjoyment of the photo description task, and then, in line with the cover story, completed a memory test recalling their partner's pictures. Following the memory items, participants completed several ratings about their photo description task partner (i.e., the confederate). They rated how friendly, sociable, likeable this person was, as well as how smoothly the interaction went and how much they thought they had in common with their partner. These items were followed by an open-ended question asking whether participants

noticed anything about the behavior or mannerisms of their photo description task partner. The complete scale can be found in Appendix A.

After leaving participants, the confederate also completed a questionnaire containing several items designed to assess how positively she felt her interaction with the participant had gone. She rated how comfortable she was with the participant, how likeable the participant was, how smoothly the interaction had gone, how friendly the participant was, how much eye contact the participant made, how often the participant smiled, and finally, the mood of the participant. The complete scale can be found in Appendix A.

### 2.2.3 Debriefing

Upon completion of the photo description questionnaire, participants were fully debriefed. The experimenter first asked several general questions, followed by increasingly specific questions about the Cyberball game, the “other participants” who were playing Cyberball, the photo description task partner, and the relationship between the two different experiments (see Bargh & Chartrand, 2000). General suspicion was assessed as well as whether participants noticed any mannerisms of the confederate. Once the experimenter obtained answers to the funnel debriefing form questions (available in Appendix A), the nature of the experiment was completely explained. Participants were asked to sign a video release form allowing their videotape data to be coded. All participants agreed to this request.

None of the participants accurately guessed the purpose of the experiment, or how the tasks were related. A few participants expressed suspicion about the Cyberball game,

and wondered whether they were really playing with other people. Exclusion of these people did not change the results of any of the analyses reported below, so these individuals were left in the sample.

Based on the results of the debriefing procedure and participants' comments to the open-ended questions on the photo description questionnaire, four participants were removed from the analyses because they indicated that they had consciously noticed the confederate shaking her foot. It is customary in nonconscious behavioral mimicry studies to remove these people (Chartrand & Bargh, 1999; Lakin & Chartrand, 2003; van Baaren et al., 2003). Given that the purpose of this study is to explore the relationship between exclusion and *nonconscious* behavioral mimicry, leaving participants in the sample who are consciously aware of their partner's behaviors threatens the validity of the mimicry measure. Removal of these four people left data from 36 participants in the analyses reported below (13 males and 23 females).

## 2.3 Results

### 2.3.1 Manipulation Checks

To establish the validity of the inclusion/exclusion manipulation, participants' ratings of their Cyberball experiences were analyzed using a one-way between-subjects analysis of variance.

#### 2.3.1.1 Affect

Participants rated the extent to which they were experiencing each of five positive emotions at the moment they completed the scale (happy, cheerful, excited, enthusiastic, and determined). Each item was rated on a 5-point scale, ranging from 1 (not at all) to 5

(extremely). The items were highly correlated, and were therefore summed to create a measure of positive affect ( $r_{\text{positive affect}} = .85$ ). Scores could range from 5 (no positive affect) to 25 (extreme positive affect). Analysis of this composite measure revealed no significant difference between excluded and included participants ( $p > .85$ ). However, participants also rated the extent to which they were experiencing each of five negative emotions at the moment they completed the scale (sad, angry, lonely, displeased, and nervous). Each item was rated on a 5-point scale, ranging from 1 (not at all) to 5 (extremely). The items were highly correlated, and were therefore summed to create a measure of negative affect ( $r_{\text{negative affect}} = .77$ ). Scores could range from 5 (no negative affect) to 25 (extreme negative affect). Analysis of this composite measure revealed a significant main effect,  $F(1, 34) = 4.23, p = .047, \eta^2 = .11$ . Although the overall amount of negative affect was rather low, participants who were excluded reported more negative affect ( $M = 8.81$ ) than participants who were included ( $M = 6.70$ ).

#### 2.3.1.2 Enjoyment of Cyberball

Participants next rated how much they enjoyed playing the Cyberball game on a 9-point scale ranging from 1 (disliked it very much) to 9 (liked it very much). Analysis of this item revealed a significant main effect,  $F(1, 34) = 7.05, p = .012, \eta^2 = .17$ .

Participants who were excluded liked playing Cyberball less ( $M = 5.13$ ) than participants who were included ( $M = 6.35$ ).

#### 2.3.1.3 Evaluation of Other Cyberball Players

Finally, participants rated how friendly, sociable, and likeable the other students ostensibly playing Cyberball were (e.g., “How friendly do you think the other students

playing Cyberball are?") on 9-point scales ranging from 1 (e.g., extremely unfriendly) to 9 (e.g., extremely friendly). These items were highly correlated and were therefore summed to create a single composite variable representing an overall evaluation of the other players ( $r_{\text{evaluation}} = .86$ ). Scores could range from 3 (an extremely negative evaluation) to 27 (an extremely positive evaluation). Analysis of this item revealed a significant main effect,  $F(1, 34) = 4.15, p = .049, \eta^2 = .11$ . Participants who were excluded evaluated the other players less favorably ( $M = 17.56$ ) than participants who were included ( $M = 19.95$ ).

#### 2.3.1.4 Summary

Taken together, these analyses reveal that the inclusion/exclusion manipulation was successful. Exclusion caused participants to experience more negative affect and enjoy playing Cyberball less. Excluded participants also evaluated the individuals who were playing the game with them less favorably than participants who were included.

#### 2.3.2 Interjudge Reliability

Two judges coded the amount of time each participant spent shaking his or her feet during the baseline and while interacting with the confederate. Although the baseline was always one minute long, the time that the confederate spent with participants varied slightly depending on the length of participants' descriptions of their pictures. Therefore, a proportion was calculated for both measures. Specifically, the number of seconds participants shook their foot during the baseline was divided by the total length of time of the baseline (60 seconds). Similarly, the number of seconds participants shook their foot during their time with the confederate was divided by the total length of time participants

spent with the confederate. Interjudge reliability for both the baseline,  $r(34) = .97, p < .001$ , and mimicry proportion measures,  $r(34) = .90, p < .001$ , was strong. Therefore, the two judges' estimates of participant foot shaking at each time point were averaged to form a baseline index and a mimicry index.

### 2.3.3 Mimicry Measure

Participants who had been excluded were expected to mimic the foot-shaking behavior of the confederate during the photo description task more than participants who had been included. A one-way between-subjects analysis of covariance was conducted on the mimicry index (with foot shaking during the baseline period as a covariate). A reliable covariate effect indicated that there were individual differences in foot-shaking behaviors,  $F(1, 33) = 34.62, p < .001, \eta^2 = .51$ ; the more participants shook their feet during the baseline, the more they shook their feet while with the confederate. However, beyond this significant covariate effect, there was also a significant main effect of condition,  $F(1, 33) = 4.27, p = .047, \eta^2 = .12$  (see Figure 1 in Appendix B). Participants who were excluded mimicked the confederate more (covariate-adjusted  $M = .28$ ) than participants who were included (covariate-adjusted  $M = .17$ ).

### 2.3.4 Relationship between Exclusion, Negative Affect, and Mimicry

The guidelines provided by Baron and Kenny (1986) for testing mediation were followed to test whether negative affect was a cause of the increase in behavioral mimicry following exclusion. As demonstrated above, exclusion and mimicry are significantly related. Exclusion also predicts negative affect. However, regression analyses demonstrated that negative affect is not related to mimicry, ( $\beta = .005, p = .619$ ),

and therefore can not be mediating the relationship between exclusion and behavioral mimicry.

### 2.3.5 Photo Description Task and Partner Ratings

Participants' ratings of affect after the photo description task and evaluation of their photo description task partner were submitted to a one-way between-subjects analysis of variance. These analyses revealed no significant effects. After completing the photo description task, there was still no difference between included and excluded participants on positive affect ( $p > .57$ ), and there was no longer a difference on negative affect ( $p > .75$ ). Because the excluded participants had a relatively negative experience while playing Cyberball, it was possible that a contrast effect would emerge on the remainder of the measures. Compared to included participants, excluded participants might have reported that the photo description task was more enjoyable and that their partner was more friendly, sociable, or likeable. However, this was not the case. There were no significant differences on any of these measures (all  $ps > .21$ ).

Finally, participants provided several ratings of their interaction with their photo description task partner and their thoughts about their relationship to their partner. They rated how smoothly the interaction went on a scale from 1 (extremely awkwardly) to 9 (extremely smoothly), how much they thought they had in common with their partner on a scale from 1 (nothing in common) to 9 (very much in common), how similar they thought they were to their partner on a scale from 1 (extremely different) to 9 (extremely similar), and how similar they thought their mannerisms were to their partners on a scale

from 1 (extremely different) to 9 (extremely similar). Analyses revealed no significant differences on any of these measures (all  $ps > .60$ ).

### 2.3.6 Confederates' Ratings

For exploratory purposes, the ratings of the participants provided by the female confederates were also submitted to analysis. Each rating was made on a 1 (e.g., extremely uncomfortable) to 9 (e.g., extremely comfortable) scale. The items were highly correlated, and were therefore summed to create a measure of confederates' evaluations of their interactions with participants ( $r_{\text{evaluation}} = .94$ ). Scores could range from 7 (an extremely negative evaluation) to 63 (an extremely positive evaluation). Analysis of this composite measure revealed a marginally significant effect of condition,  $F(1, 34) = 2.68$ ,  $p = .111$ ,  $\eta^2 = .07$ . Confederates evaluated their interactions with excluded participants more positively ( $M = 46.94$ ) than their interactions with included participants ( $M = 42.20$ ).

## 2.4 Discussion

The results of Experiment 1 indicate that the inclusion/exclusion manipulation was successful. Compared to participants who were included while playing Cyberball, participants who were excluded experienced more negative affect when the experience was over, reported less enjoyment of the game, and evaluated the "other players" more negatively.

More importantly, participants who were excluded mimicked the foot-shaking behaviors of their interaction partner more during the photo description task than participants who were included. Given the relationship between mimicking the behaviors

of others and affiliation (Lakin & Chartrand, 2003), the increase in mimicking tendencies seen after exclusion suggests that participants may be trying to recover from their exclusion experience by affiliating with their new interaction partner. The confederates' ratings of her interactions with participants are consistent with this argument; there was a tendency for confederates to rate their interactions with excluded participants more positively than their interactions with included participants. Thus, it appears from the confederates' ratings that excluded participants were at least somewhat successful in their attempts to affiliate.

It is also important to note that the increase in mimicry by excluded participants occurred despite the fact that they reported no conscious awareness of the confederate's foot-shaking behaviors or the fact that their own behaviors were affected by the confederate. This suggests that the behavioral mimicry that occurred was indeed nonconscious, and raises the interesting issue of the adaptiveness of this behavioral tendency. Use of mimicry in situations where a person wants to affiliate is functional, as it gives people an opportunity to pursue their affiliation goal without spending limited cognitive resources on determining the best way to do so.

Finally, the increase in mimicry that occurred after exclusion was not mediated by the negative affect that participants were experiencing; although excluded participants reported more negative affect, this negative affect was not the cause of their increase in mimicry. There are several possible explanations for the lack of mediation. First, it is possible that negative affect does not mediate increases in mimicry. While this might initially seem surprising, there is a growing amount of evidence suggesting that negative

affect does not mediate the relationship between exclusion and its behavioral consequences, and is perhaps not even affected by certain types of exclusion or rejection experiences. In the work of Baumeister, Twenge, and colleagues, various measures of negative affect are often unaffected by exclusion manipulations (Baumeister et al., 2002; Twenge et al., 2001), and in the rare case where negative affect is affected, mediation does not occur (Twenge et al., 2002). Twenge, Catanese, and Baumeister (in press) have recently proposed a model where social exclusion is associated with “the deconstructed state,” which is characterized by a lack of strong emotion, and could therefore potentially explain their lack of emotion effects. Their model may even be consistent with the negative affect results of Experiment 1. Despite the relative difference between the exclusion and inclusion conditions, the overall level of negative affect was quite low.

Moreover, there is research showing that nonconscious behavioral mimicry may be less likely to occur when people report being in a negative mood or are induced into a negative state (e.g., by watching sad film clips; van Baaren, Fockenberg, Holland, Janssen, & van Knippenberg, 2003). With the work of Baumeister, Twenge, and colleagues, this research suggests that perhaps negative affect is not the process through which behavioral mimicry is increased.

An alternative explanation is that the specific negative emotions measured in Experiment 1 simply do not tap into the negative feelings that motivated the increase in mimicry in the exclusion condition. To explore this possibility, negative affect was measured again in Experiment 2, but the specific negative emotions assessed were different.

Because people have a need to belong, being excluded motivates people to engage in affiliative behaviors as a way to accomplish their unfulfilled need (Baumeister & Leary, 1995). Experiment 1 demonstrated one instance of this relationship – being excluded increases nonconscious behavioral mimicry. A second experiment was conducted to replicate this effect, and explore whether the heightened affiliation need that results from exclusion can be addressed by mimicking the behaviors of *any* interaction partner. That is, would mimicry of an interaction partner’s behaviors still occur if the interaction partner did not share a salient characteristic with the excluding group?

In Experiment 1, participants believed that the other players in the Cyberball game were other participants in the experiment. However, no information was provided about these people. Participants did not meet them (or even think that they were going to meet them), and the experimenter did not provide participants with any information about them. Participants did not even know the sex of the other “players,” as the initials of the players (e.g., K. S.) were the only information that appeared on the computer screen. In addition, effort was taken to ensure that participants thought that their photo description task partner was *not* a member of the group who played Cyberball. Therefore, participants presumably thought that the confederate was someone with whom they may have been able to develop a positive relationship. Their belongingness needs had been threatened by the Cyberball exclusion, and they attempted to affiliate with a later interaction partner who they thought could address that threatened need.

But some people may be better able to address threatened belongingness needs than others. For example, imagine a situation where a female participant is excluded by a

group of females. This exclusion should be relatively threatening, since females are an important ingroup for the participant.<sup>1</sup> After this exclusion experience, the female participant interacts with a new person (i.e., not someone from the actual excluding group). Mimicking this particular person's behaviors may not always be a way to address the female participant's threatened belongingness need. If the new interaction partner is female, mimicry might be one potential way to restore the participant's identity in the group that excluded her; affiliating with the new (female) interaction partner addresses the female participant's need to belong to her ingroup. Significant mimicry should therefore occur. However, if the new interaction partner is male, mimicking his behavior will not help the female participant address her threatened belongingness need. Mimicking this (male) person could create liking or rapport more generally, but increased mimicry may be less likely to occur in this situation because it does not resolve the female participant's threatened belongingness need.

A follow-up study was conducted to address this issue. The results of this study are particularly important to the nonconscious behavioral mimicry literature as they will indicate whether mimicry can be used to directly address threatened belongingness needs in addition to creating generalized feelings of liking and rapport. Significant increases in mimicry may only be observed in situations where important identities have been threatened and have the potential to be re-established (i.e., the to-be-mimicked person shares a salient characteristic with the excluding group).

## CHAPTER 3

### EXPERIMENT 2: MIMICRY AND THREATENED BELONGINGNESS NEEDS

The bi-directional relationship between behavioral mimicry and the development of rapport has been well-established. Rapport leads to mimicry, and mimicry creates rapport. Research has also demonstrated that a *desire* to create rapport increases behavioral mimicry. As the literature on nonconscious behavioral mimicry continues to develop, it will be important to understand the limitations of this effect. That is, does mimicry inevitably occur when there is a desire to affiliate? I argue that the answer is no.

Mimicry should occur to a greater extent in a situation where the person who can be mimicked shares a salient characteristic with the person who was excluded *and* with members of the excluding group. Mimicry of this person has the potential to address the belongingness need of the participant that was threatened by the original exclusion. However, this particular relationship may only be observed if the actual exclusion experience is threatening. If a participant is excluded by an outgroup (i.e., a group that the participant is not currently and may never be a member of), belongingness needs should not be threatened. Therefore, mimicry should also be less likely to occur, regardless of whether the confederate's group membership matches a salient characteristic of the excluding group. This pattern of findings would be particularly

interesting, because they would suggest a heretofore unrecognized consequence of nonconscious behavioral mimicry: addressing threatened belongingness needs.

To test this idea, female participants were excluded by an all-female or an all-male group (or were in a no exclusion control condition). They were then given a chance to interact with a female or male confederate who was not part of the original excluding group. They were video-recorded during their interactions with the confederate, and these recordings were later coded to determine the extent to which behavioral mimicry occurred. Thus, this study was a 3 (condition: female exclusion, male exclusion, no exclusion) by 2 (confederate: female, male) design with behavioral mimicry as the primary dependent variable.

### 3.1 Hypotheses

#### 3.1.1 Exclusion by an All-Female Group

For the female participants, an all-female group is an ingroup.<sup>1</sup> Being excluded by this ingroup should threaten belongingness, and will therefore lead to an increase in behavioral mimicry. However, this effect should only be apparent when there is a female confederate for participants to mimic. It is only in this condition that threatened belongingness needs can be addressed directly by creating liking or rapport with a person who is a representative of the excluding group (because of her ingroup status). When participants are excluded by females, but interact with a male confederate during the second portion of the experiment, mimicking the male confederate's behaviors will not help the female to address her threatened belongingness need. Therefore, there should be

significantly more mimicry in the female exclusion / female confederate condition than in the female exclusion / male confederate condition.

### 3.1.2 Exclusion by an All-Male Group.

For the female participants, an all-male group is an outgroup. Being excluded by this outgroup should not threaten belongingness needs, because the female participants do not belong to the male outgroup. Because sex information will be the only information that participants know about their Cyberball partners, this should be the most salient explanation for the exclusion, suggesting that participants will attribute the exclusion to their sex and therefore not have their belongingness needs threatened. As a result, mimicry should not occur with the female or male confederate, because female participants are not threatened by the male exclusion.

Although elevated mimicry is not predicted to occur in either of the male exclusion conditions, it would perhaps not be surprising to see an increase in mimicry in the male exclusion / male confederate condition relative to the male exclusion / female confederate condition. However, if this occurs, it would likely be due to a different process than the mimicry in the female exclusion / female confederate condition (described above). In the case of exclusion by an all-male group, belongingness should not be threatened (the female participant is not a member of the male group). Other fundamental needs might be affected, however. For example, female participants may experience a threat to self-esteem when excluded by a male group. Alternatively, they may also experience threat at a basic romantic relationship level, which could be an evolutionary-based process (due to the male/female nature of the groups). Women may

therefore mimic a male confederate as a way to create liking with a member of the group, or restore self-esteem or relationship status. If increased mimicry occurs in the male exclusion / male confederate condition, it would perhaps be mediated by something other than threatened belongingness needs.

## 3.2 Method

### 3.2.1 Participants

One hundred and sixty nine female introductory psychology students participated in exchange for course credit.

### 3.2.2 Procedure

As before, participants were recruited for an experiment on visualization and description. Other than the exceptions discussed below, the procedures for the exclusion conditions of Experiment 2 were identical to the procedures of Experiment 1. The procedures for the no exclusion control condition are detailed at the end of this section.

The mental visualization experience consisted of a game of Cyberball where the program was configured to exclude participants. However, unlike Experiment 1, participants were given sex information about their fellow Cyberball players. In the female exclusion condition, unambiguous female name labels appeared next to the players' icons (i.e., Ashley, Susan, Jenna). In the male exclusion condition, unambiguous male name labels appeared next to the players' icons (i.e., Aaron, Steven, Jeremy). Thus, the female participants were aware of the sex of the people who excluded them. The questionnaire completed after the Cyberball game (i.e., the mental visualization questionnaire) contained manipulation check items to ensure that participants encoded

and remembered this sex information. Specifically, participants were asked to indicate the sex of each of the three other people with whom they were playing Cyberball, as well as provide two adjectives to describe their mental visualization of each player (to be consistent with the cover story).

Additional questions were also added to the mental visualization questionnaire completed after the Cyberball game in an attempt to measure perceived threat to the needs proposed by Williams (1997, 2001; see also Williams et al., 2001) in his model of ostracism. Participants rated how much they felt that they had belonged to the group playing Cyberball (belongingness need), the extent to which they thought the other participants valued them as a person (self-esteem need), the extent to which they felt life was meaningful (meaningful existence need) and the extent to which they felt in control of their lives (control need). Items from the social sub-scale of the State Self-Esteem Scale (Heatherton & Polivy, 1991) were also included to further explore potential threats to self-esteem. The complete mental visualization questionnaire can be found in Appendix C.

After completing the mental visualization questionnaire, participants completed the same photo description task as in Experiment 1. The sex of the confederate with whom participants interacted was manipulated, and a manipulation check item was included on the questionnaire completed at the end of the photo description task to ensure that participants could recall whether they interacted with a male or a female (the complete scale can be found in Appendix C). An additional change from Experiment 1 was the way the confederates were trained to shake their foot. Rather than sit with one leg

crossed over the other, confederates were instructed to keep both feet on the floor, and to bounce their right leg (the leg closest to participants) at a slow, steady pace. This change was made because this type of foot shaking is more gender-neutral than the crossed-leg foot shaking used in Experiment 1.

Finally, Experiment 2 included a no exclusion control condition as opposed to an inclusion condition (as in Experiment 1). In the control condition, participants were told that they would be completing two unrelated experiments: one on personality and emotions, and a second on describing a set of novel photographs. Rather than playing Cyberball, participants were then handed a questionnaire (see Appendix C) that contained the positive and negative affect items, the meaningful existence and control needs questions, and the state self-esteem items that the exclusion condition participants completed (the belongingness and self-esteem items were not included, as they were not relevant to participants who did not play Cyberball). Upon completion of this questionnaire, the experimenter explained that participants would now be beginning the second experiment. The procedures for the Photo Description Task were identical to the procedures in the exclusion conditions.

### 3.2.3 Debriefing

The funnel debriefing procedure was also slightly different from the one used in Experiment 1. The experimenter first asked several general questions, followed by increasingly specific questions about the Cyberball game (if participants played Cyberball), the photo description task partner, and the relationship between the two different experiments (see Bargh & Chartrand, 2000). General suspicion was assessed as

well as whether participants noticed any mannerisms of the confederate. Participants who played Cyberball were also asked whether anything unusual had occurred during the Cyberball game. If participants spontaneously mentioned that they had been excluded (which most did), an attribution for this exclusion was elicited by the experimenter. In the event that participants did not mention being excluded, the experimenter specifically asked whether they had received the ball more often or less often than the other players, and why this result occurred. Once the experimenter obtained answers to all of the funnel debriefing form questions (available in Appendix C), the nature of the experiment was completely explained. Participants were asked to sign a video release form allowing their videotape data to be coded. All participants agreed to this request.

None of the participants accurately guessed the purpose of the experiment, or how the tasks were related. A few participants again expressed suspicion about the Cyberball game, and wondered whether they were really playing with other people. Exclusion of these people did not change the results of any of the analyses reported below (as in Experiment 1), so these individuals were left in the sample.

Based on the results of the debriefing procedure and participants' comments to the open-ended questions on the photo description questionnaire, four participants were removed from the analyses because they indicated that they had consciously noticed the confederate shaking his or her foot.

### 3.3 Results

#### 3.3.1 Manipulation Checks

##### 3.3.1.1 Sex Identification of Cyberball Partners and Photo Description Task Partner

The validity of the Cyberball exclusion manipulation was established in Experiment 1. Therefore, the most important manipulation checks for Experiment 2 were the questions asking participants to identify the sex of their Cyberball partners and the sex of the confederate with whom they interacted during the Photo Description Task. A visual inspection of these items revealed that nine participants did not correctly identify the sex of all three of their Cyberball partners (i.e., they said they were playing with a mixed-sex group). Additionally, two participants did not answer all three of these questions, suggesting that they could not remember the sex of at least one of their Cyberball partners. Given the importance of the sex information for the manipulation of type of exclusion, these 11 participants were removed from the analyses reported below. Participants correctly identified the sex of the confederate that they interacted with during the photo description task 100% of the time. Thus, the analyses reported below are based on data from 149 female participants.

##### 3.3.1.2 Affect

Participants rated the extent to which they were experiencing each of seven positive emotions at the moment they completed the scale (happy, cheerful, excited, content, satisfied, pleased, and joyful). Each item was rated on a 5-point scale, ranging from 1 (not at all) to 5 (extremely). The items were highly correlated, and were therefore summed to create a measure of positive affect ( $r_{\text{positive affect}} = .88$ ). Scores could range

from 7 (no positive affect) to 35 (extreme positive affect). A one-way analysis of variance (ANOVA) on this composite measure with condition as the independent variable (excluded by females, excluded by males, no exclusion) revealed a significant effect,  $F(2, 146) = 4.01, p = .020, \eta^2 = .05$ . Participants who were not excluded experienced more positive affect ( $M = 20.62$ ) than participants in either of the exclusion conditions (excluded by females  $M = 18.04$ , excluded by males  $M = 18.00$ )

Participants also rated the extent to which they were experiencing each of seven negative emotions at the moment they completed the scale (sad, angry, lonely, displeased, nervous, distressed, and upset). Each item was rated on a 5-point scale, ranging from 1 (not at all) to 5 (extremely). The items were highly correlated, and were therefore summed to create a measure of negative affect ( $r_{\text{negative affect}} = .82$ ). Scores could range from 7 (no negative affect) to 35 (extreme negative affect). Analysis of this composite measure revealed no significant differences among conditions,  $p = .740$ .

### 3.3.1.3 Enjoyment of Cyberball and Evaluation of Other Cyberball Players

Because participants in the control condition did not play the Cyberball game, they did not answer the Cyberball-relevant questions that could be used as manipulation checks (i.e., enjoyment of the game, evaluation of the other Cyberball players).

Nevertheless, these items were analyzed to determine whether there was a difference between the female and male exclusion conditions. An ANOVA revealed no significant difference on enjoyment of the Cyberball game,  $p = .987$ .

Participants also rated how friendly, sociable, likeable, and intelligent the other students ostensibly playing Cyberball were (e.g., “How friendly do you think the other

students playing Cyberball are?”) on 9-point scales ranging from 1 (e.g., extremely unfriendly) to 9 (e.g., extremely friendly). These items were highly correlated and were therefore summed to create a single composite variable representing an overall evaluation of the other players ( $r_{\text{evaluation}} = .89$ ). Scores could range from 4 (an extremely negative evaluation) to 36 (an extremely positive evaluation). Analysis of this item revealed a significant effect,  $F(1, 94) = 8.23, p = .005, \eta^2 = .08$ . Participants in the female exclusion condition evaluated the other players more favorably ( $M = 24.13$ ) than participants in the male exclusion condition ( $M = 21.02$ ).

#### 3.3.1.4 Summary

These analyses suggest that the vast majority of participants were attuned to both the manipulations: sex of the Cyberball partners (if Cyberball was played) and sex of the confederate during the Photo Description Task. Further support for the encoding of the sex information is found in the ingroup favoritism seen on the Cyberball partner evaluation measure; female participants evaluated other female players (members of their ingroup) more positively than male players (members of their outgroup), even when they were excluded by these groups. This sort of ingroup favoritism has been demonstrated in much previous literature (e.g., Brewer, 1979; Crocker & Schwartz, 1985; for a review, see also Hewstone, Rubin, & Willis, 2002).

Although the absence of an inclusion condition precludes a direct test of the success of the exclusion manipulation using the enjoyment of Cyberball and Cyberball partner evaluation measures (used to validate the exclusion in Experiment 1), the results of the affect measures again suggest that participants were aware of having been

excluded while playing Cyberball. Excluded participants experienced less positive affect upon completion of the game than participants who were not excluded. Further evidence for the effectiveness of the exclusion manipulation is found in the fact that almost all participants in the exclusion conditions spontaneously reported during the funneled debriefing that no one threw them the ball or that they felt excluded while playing Cyberball.

### 3.3.2 State Self-Esteem

Heatherton and Polivy's (1991) State Self-Esteem Scale is divided into three subscales, one of which measures social self-esteem. The seven items from this sub-scale were included on the mental visualization questionnaire (e.g., "I am worried about what other people think of me."), along with several filler items. Each item was rated on a 5-point scale, ranging from 1 (not at all) to 5 (extremely). After the appropriate items were reverse-scored, the social state self-esteem items were highly correlated, and were therefore summed to create a composite measure of social state self-esteem ( $r_{\text{social state self-esteem}} = .85$ ). Scores could range from 5 (low social state self-esteem) to 35 (high social state self-esteem). A one-way ANOVA on this composite measure with condition as the independent variable (excluded by females, excluded by males, no exclusion) did not reveal a significant effect,  $p = .540$ .

### 3.3.3 Ostracism Model Needs

Williams (1997, 2001) proposed that four basic needs would be threatened by exclusion. In Experiment 2, the measures that Williams typically uses to assess each of

these needs were included (see Williams et al., 2001) on the mental visualization questionnaire.

#### 3.3.3.1 Belongingness

Participants completed one item measuring the extent to which they felt they belonged to the Cyberball group (i.e., “How much do you feel you belonged to the group playing Cyberball?”). The item was completed on a 9-point scale, ranging from 1 (not at all) to 9 (very much). Only participants in the exclusion conditions completed this item, so a one sample t-test was conducted to test whether participants scored below the midpoint of the scale (5), which would indicate that exclusion threatened belongingness needs. Participants in both the female exclusion,  $t(46) = -4.99, p < .001$ , and male exclusion,  $t(48) = -11.63, p < .001$ , conditions scored significantly below the midpoint of the scale ( $M_s = 3.72$  and  $2.69$ , respectively). A one-way ANOVA with condition as the independent variable also revealed a significant difference between the female and male exclusion conditions,  $F(1, 94) = 10.22, p = .002, \eta^2 = .10$ ; the female participants felt that they belonged to the female exclusion group more than the male exclusion group.

#### 3.3.3.2 Self-Esteem

Participants completed one item measuring the extent to which they felt that the other participants valued them (i.e., “To what extent do you think that the other participants value you as a person?”). The item was completed on a 9-point scale, ranging from 1 (not at all) to 9 (very much). Again, only participants in the exclusion conditions completed this item, so a one sample t-test was conducted to test whether participants scored below the midpoint of the scale (5), which would indicate that exclusion

threatened self-esteem needs. Participants in the female exclusion condition were not significantly lower than the midpoint of the scale,  $t(46) = -1.31, p = .197$ , but participants in the male exclusion condition were,  $t(48) = -2.27, p = .028$ , ( $M_s = 4.62$  and  $4.27$ , respectively). However, a one-way ANOVA with condition as the independent variable revealed that the difference between the female and male exclusion conditions was not statistically significant,  $p = .424$ .

#### 3.3.3.3 Meaningful Existence

Participants completed one item measuring the extent to which they felt that life is meaningless (i.e., “How true is the statement ‘Life is meaningless’?”). The item was completed on a 9-point scale, ranging from 1 (not at all) to 9 (very much). A one-way ANOVA with condition as the independent variable did not reveal a significant effect,  $p = .612$ .

#### 3.3.3.4 Control

Participants completed one item measuring the extent to which they felt that they are in control of their lives (i.e., “How true is the statement ‘I am in control of my life’?”). The item was completed on a 9-point scale, ranging from 1 (not at all) to 9 (very much). A one-way ANOVA with condition as the independent variable did not reveal a significant effect,  $p = .911$ .

#### 3.3.4 Interjudge Reliability

Two judges coded the amount of time each participant spent shaking her feet during the baseline and while interacting with the confederate. One judge coded 100% of the tapes, and the other coded the first 45% of the tapes ( $N=67$ ).

Although the baseline was always one minute long, the time that the confederate spent with participants varied slightly depending on the length of participants' descriptions of their pictures. Therefore, a proportion was calculated for both measures. Specifically, the number of seconds participants shook their foot during the baseline was divided by the total length of time of the baseline (60 seconds). Similarly, the number of seconds participants shook their foot during their time with the confederate was divided by the total length of time participants spent with the confederate. Interjudge reliability for the 67 participants that were coded by both judges for both the baseline,  $r(65) = .96$ ,  $p < .001$ , and mimicry proportion measures,  $r(65) = .95$ ,  $p < .001$ , was strong. Therefore, the two judges' estimates of participant foot shaking at each time point were averaged to form a baseline index and a mimicry index for the 67 participants whose videos were coded twice. For the remaining participants, the single judge's estimates of foot shaking were used for the baseline and mimicry indices.

### 3.3.5 Mimicry Measure

Participants who had been excluded by females and interacted with a female confederate were expected to mimic the foot-shaking behavior of the confederate during the photo description task more than participants in any of the other five conditions. A between-subjects analysis of covariance was conducted on the mimicry index (with foot shaking during the baseline period as a covariate). A reliable covariate effect indicated that there were again individual differences in foot-shaking behaviors,  $F(1, 139) = 57.97$ ,  $p < .001$ ,  $\eta^2 = .29$ ; the more participants shook their feet during the baseline, the more they shook their feet while with the confederate. However, beyond this significant

covariate effect, there was also a significant interaction,  $F(2, 139) = 3.00, p = .053, \eta^2 = .04$  (see Figure 2 in Appendix D). Follow-up analyses revealed that participants in the female exclusion condition mimicked the female confederate (covariate-adjusted  $M = .37$ ) more than the male confederate (covariate-adjusted  $M = .23$ ),  $F(1, 44) = 8.09, p = .007, \eta^2 = .16$ . However, there were no differences between mimicry of the female and male confederates in the male exclusion (covariate-adjusted  $M_s = .25$  and  $.26$ , respectively) or control conditions (covariate-adjusted  $M_s = .21$  and  $.24$ , respectively),  $p_s > .65$ . A planned contrast comparing the female exclusion / female confederate condition to all five of the other conditions was also significant,  $t(140) = 3.14, p = .002$ .

### 3.3.6 Positive Affect, State Self-Esteem, Ostracism Model Needs, and Mimicry

The increase in mimicry seen when participants interacted with a female confederate following exclusion by females can be explored further by determining what caused this increase in mimicry to occur. There are several possibilities. First, participants who were excluded by females experienced less positive affect than participants in the control condition. However, the fact that their reduced positive affect was similar to the level experienced by participants in the male exclusion condition suggests that positive affect is probably not related to mimicry. A correlational analysis supported this contention,  $r(144) = -.12, p = .156$ . A similar argument can be made for social state self-esteem, which did not differ among conditions. It was also unrelated to mimicry,  $r(143) = .08, p = .369$ .

The picture looks slightly different when exploring the relationship between the needs that could be threatened by exclusion and mimicry. Self-esteem, meaningful

existence, and control needs did not appear to be affected by exclusion and were not correlated with mimicry,  $r_s < .06$ ,  $p_s > .47$ . However, the increase in mimicry in the female exclusion / female confederate condition was hypothesized to be a result of a threat to belongingness needs that could be addressed through mimicking the behaviors of someone who shares a salient characteristic with the participant and the group that did the excluding (in this case, being female). This suggests that belongingness needs will mediate the relationship between exclusion and increases in behavioral mimicry, but only in the case where participants interact with a female confederate.

Standard mediational analyses are inappropriate in this situation. The interaction of condition and confederate sex does not predict responses to the belongingness measure (the confederate sex manipulation had not yet been introduced when this measure was completed). Therefore, following the procedures utilized by Priester and Petty (1995, see also Tormala & Petty, 2001), the correlation between belongingness needs and mimicry in each of the four relevant conditions was computed. To test whether the correlation between belongingness and mimicry in the female exclusion / female confederate condition ( $r[22] = .40$ ,  $p = .054$ ) differed significantly from correlations in the other three conditions, a single correlation coefficient was computed for these conditions ( $r[69] = .05$ ,  $p = .710$ ), and a Fisher's  $r$  to  $z$  transformation was performed to compare the two correlation coefficients. As predicted, this analysis revealed a marginally significant difference,  $z = 1.50$ ,  $p = .067$  (one-tailed); belongingness needs were a stronger predictor of mimicry in the female exclusion / female confederate condition than in the other three conditions.

### 3.3.7 Attributions for Exclusion

#### 3.3.7.1 Female Exclusion Condition

In the female exclusion condition, participants were typically unable to make an attribution for their exclusion. Of the 47 participants in this condition, 81% replied they did not know why they had been excluded. The remainder of the responses were coded into an “other” category (e.g., “The people knew each other” or “I was the youngest”). As expected, no participants mentioned anything to do with sex as a reason for exclusion. A one-way ANOVA with attribution category as the independent variable did not reveal a significant difference in mimicry by participants in these two categories,  $p = .838$ .

#### 3.3.7.2 Male Exclusion Condition

In the male exclusion condition, participants typically made a sex-linked attribution for their exclusion. Of the 49 participants in this condition, 61% replied that they had been excluded because of their sex. The remainder of the responses were coded into an “unsure” (25%) or an “other” category (14%). A one-way ANOVA with attribution category as the independent variable did not reveal a significant difference in mimicry by participants in these different categories,  $p = .466$ . However, the pattern of means is in a direction consistent with the idea that attributing exclusion to group membership (i.e., sex) leads to less mimicry (sex-attribution  $M = .24$ , compared to unsure  $M = .31$  and other  $M = .31$ ).

### 3.3.8 Photo Description Task and Partner Ratings

Participants’ ratings of affect after the photo description task and evaluation of their photo description task partner were submitted to a between-subjects ANOVA with

condition (female exclusion, male exclusion, no exclusion control) and confederate sex (female, male) as the independent variables. These analyses revealed no significant main effects or interactions (all  $ps > .13$ ). After completing the photo description task, there were no significant differences between participants on negative affect, and there were no longer differences on positive affect. There were also no significant differences on participants' evaluations of how likeable, friendly, sociable, or intelligent their photo description task partners were (all  $ps > .26$ ).

Finally, participants provided several ratings of their interaction with their photo description task partner and their thoughts about their relationship to their partner. They rated how smoothly the interaction went on a scale from 1 (extremely awkwardly) to 9 (extremely smoothly), how much they thought they had in common with their partner on a scale from 1 (nothing in common) to 9 (very much in common), how similar they thought they were to their partner on a scale from 1 (extremely different) to 9 (extremely similar), and how similar they thought their mannerisms were to their partners on a scale from 1 (extremely different) to 9 (extremely similar). Analyses revealed no significant main effects or interactions on any of these measures (all  $ps > .12$ ).

### 3.3.9 Confederates' Ratings

For exploratory purposes, the ratings of the participants provided by the confederates were again submitted to analysis. Each rating was made on a 1 (e.g., extremely uncomfortable) to 9 (e.g., extremely comfortable) scale. The items were highly correlated, and were therefore summed to create a measure of confederates' evaluations of their interactions with participants ( $r_{\text{evaluation}} = .91$ ). Scores could range from 7 (an

extremely negative evaluation) to 63 (an extremely positive evaluation). Analysis of this composite measure revealed a significant effect of condition,  $F(2, 143) = 3.62, p = .029, \eta^2 = .05$ . This main effect was qualified by a significant interaction,  $F(2, 143) = 3.22, p = .043, \eta^2 = .04$ . Follow-up analyses revealed that participants in the female exclusion condition were not differentially evaluated when they interacted with the female ( $M = 47.33$ ) or male ( $M = 44.57$ ) confederates,  $p = .237$ , although the pattern of means is consistent with the hypothesis that mimicry creates liking. Participants in the male exclusion condition were also not differentially evaluated when they interacted with the female ( $M = 46.80$ ) or male ( $M = 49.96$ ) confederates,  $p = .143$ . There was a marginally significant effect in the control condition,  $F(1, 51) = 3.66, p = .061, \eta^2 = .07$ . Participants who interacted with a female confederate were evaluated more positively ( $M = 46.46$ ) than participants who interacted with a male confederate ( $M = 40.82$ ). Perhaps the female confederates were also showing ingroup favoritism by rating their interactions with other members of their ingroup as more successful.

An additional question was added to the confederates' questionnaire asking them to assess the degree to which they thought participants mimicked their foot shaking (i.e., "How much do you think that the subject mimicked your foot shaking?"). This question was completed on a 9-point scale, ranging from 1 (didn't mimic at all) to 9 (mimicked a lot). Analysis of this item revealed a significant main effect of confederate sex,  $F(1, 143) = 11.79, p = .001, \eta^2 = .08$ ; female confederates thought they were mimicked more than male confederates ( $M_s = 4.02$  and  $2.82$ , respectively). Additionally, there was a marginally significant main effect of condition,  $F(2, 143) = 2.50, p = .086, \eta^2 = .03$ .

Confederates thought that participants in the exclusion conditions (female exclusion  $M = 3.77$ , male exclusion  $M = 3.61$ ) mimicked them more than participants in the control condition ( $M = 2.88$ ). The interaction of these variables was not significant,  $p = .510$ .

### 3.4 Discussion

The results of Experiment 2 demonstrate that, in addition to creating liking and rapport, mimicking the behaviors of others can be used to address threatened belongingness needs. In this experiment, a situation was created where female participants were excluded by an all-female or all-male group and then interacted with a female or male confederate. When the female participants were excluded by an ingroup and the confederate was also an ingroup member, they mimicked the behaviors of that confederate more. It is only in this condition that mimicry has the potential to directly address the threatened belongingness needs of excluded participants. Thus, the observed increase in mimicry suggests that participants may be trying to address these needs by affiliating through mimicry.

Interestingly, there was no hint of an increase in mimicry in the male exclusion / male confederate condition. The baseline level of mimicry that occurred in this condition is consistent with the threatened belongingness needs hypothesis; females are not and never will be members of the male group. The lack of an increase in mimicry in this condition also suggests that the female participants may not have had an increased desire to affiliate with a member of the male group.

It is again important to note that the increase in mimicry of the female confederate by female-excluded participants occurred despite the fact that they reported no conscious

awareness of the confederate's foot-shaking behaviors or the fact that their own behaviors were affected by the confederate. The mimicry was nonconscious, and supports the results of Experiment 1 in suggesting the adaptiveness of behavioral mimicry tendencies.

Unlike the confederates in Experiment 1, the confederates in the current study did not seem to be as attuned to the affiliation attempts of the female participants in the female exclusion / female confederate condition. Although there was a significant interaction on this measure, the pattern seems to suggest that participants in both the female and male exclusion conditions were evaluated more favorably than participants in the control condition. It is unclear why this particular pattern would have emerged, given the differing mimicry levels in these conditions.

Despite the inclusion of several different types of affect items, the results of Experiment 2 still did not provide any evidence that affect, positive or negative, mediates the relationship between exclusion and mimicry. Experiment 1 showed an effect of exclusion on negative affect but not positive, whereas Experiment 2 showed an effect of exclusion on positive affect but not negative. The lack of mediation by affect has now been replicated; a relationship between affect and mimicry was not present in either experiment. The deconstructed state model that Twenge et al. (in press) have proposed may be the best explanation for the lack of affect effects in the present experiments. To the extent that exclusion creates a "numb" state, extreme affect would not occur, and would not be causing downstream consequences (e.g., behavioral mimicry). The inconsistency of effects present in the larger exclusion literature will need to be further explored in future research, but it seems safe to conclude that exclusion is not causing an

increase in mimicry because of the affect that participants may (or may not) be experiencing.

Interestingly, the results of Experiment 2 also suggest that there is no relationship between exclusion, self-esteem, and mimicry. There was no effect of exclusion on social state self-esteem, and the results on Williams' measure of self-esteem are consistent with this null effect. The lack of results on the social sub-scale of the State Self-Esteem Scale are also consistent with null effects reported by Twenge et al. (in press). However, as a whole, the self-esteem results are *inconsistent* with much of Leary and colleagues sociometer research (e.g., Leary et al., 1995; Leary et al., 2003), which predicts that self-esteem will be affected by exclusion experiences. It is unclear why this discrepancy exists. Perhaps there is something specific about the *type* of exclusion that occurs. For example, Twenge et al. tell participants that they are likely to spend their future alone, whereas participants in Leary and colleagues research are typically actively rejected (in person) by a desirable group. The Cyberball manipulation of exclusion utilized in the present studies may be more similar to the future alone manipulation of Twenge et al. because participants are not actually rejected by other people in person. Future research should continue to explore the relationship between exclusion and self-esteem, specifically differences between types of rejection or exclusion. Regardless, the lack of a relationship between self-esteem and mimicry suggests that self-esteem is not the cause of the increase in mimicry in the female exclusion / female confederate condition.

The current experiment also revealed no significant effects of exclusion on meaningful existence or control needs, contrary to the predictions made by Williams

(1997, 2001). Twenge et al. (in press) also found no effects of exclusion on a measure of control, but they did find effects on meaningful existence. Again, it is unclear why these effects would not have emerged in the present experiment, but there does seem to be growing evidence that different types of exclusion may have different effects.

There were significant effects on the belongingness measure included in Experiment 2. Given the pattern of means on this measure, the relationship between exclusion condition, belongingness, and mimicry that emerged may seem counter to the hypotheses. First, the female participants experienced belongingness threat in both the female and male exclusion conditions. However, it is important to remember that the question measuring belongingness actually asked about the extent to which participants felt that they belonged to the *Cyberball* group. In retrospect, this question is perhaps not the best measure of belongingness threat. A more appropriate question would have been to ask about *general* rather than *specific* belongingness threat (i.e., threat to female identity as opposed to the threat that results from exclusion by the specific Cyberball group). This type of question would have presumably shown that females were less threatened by the male exclusion than the female exclusion.

Second, female participants actually reported more belonging to the Cyberball group in the female exclusion condition than in the male exclusion condition. Again, it is important to remember that the belongingness question measured belonging to the Cyberball group. Therefore, it makes sense that females would feel as if they belonged to the female exclusion group more than the male exclusion group; females are an ingroup, whereas males are an outgroup. It is likely that if the appropriate inclusion comparison

conditions had been included in this study, there would have been a main effect for group type, such that female participants would always feel that they belonged to the Cyberball group more when it was composed of ingroup members (i.e., other females).

In a sense, then, the belongingness question used in Experiment 2 measures both exclusion and ingroup status – participants in the female exclusion condition acknowledge feeling excluded (as do participants in the male exclusion condition), but they also acknowledge that they belong to the female group more than the male group. The correlational data support this interpretation. Participants in the female exclusion / female confederate condition feel excluded, but their belongingness to the female group is related to their mimicry of the female confederate. This is not the case in any of the other conditions. In other words, given that all participants were experiencing belongingness threat from the Cyberball group, the participants who felt that they belonged to the excluding group the most were the participants who were most likely to mimic the behaviors of a confederate sharing that group membership.

Finally, this study also raises an interesting issue with regard to the attributions that people make when they are excluded. In the female exclusion condition, female participants did not have a readily available explanation for their exclusion. However, in the male exclusion condition, the majority of female participants made a sex-based attribution for their exclusion. To the extent that participants acknowledged that this was the reason for the exclusion, they mimicked the confederate less during the photo description task. This result did not reach conventional levels of significance, but seems both interpretable and interesting to pursue further in future research.

## CHAPTER 4

### GENERAL DISCUSSION

Exclusion from social groups has negative emotional, psychological, and behavioral consequences. Yet it also seems important to explore the alternative; perhaps after exclusion, individuals engage in behaviors that help them affiliate with new people or re-establish themselves in the excluding group. Nonconscious behavioral mimicry could serve this objective, as mimicking the behaviors of others has repeatedly been shown to increase liking and rapport.

#### 4.1 Summary of Effects

The research presented in this paper explores the link between exclusion and behavioral mimicry. It extends previous research by showing that nonconscious behavioral mimicry of a new interaction partner occurs more when participants have recently been excluded (Experiment 1). Moreover, mimicking the behaviors of others does not occur simply to create liking or rapport; mimicking others may also directly address threatened belongingness needs. As the results of Experiment 2 demonstrate, individuals who were excluded by an ingroup mimicked the behaviors of a subsequent interaction partner more, but only if this person was also a representative member of the ingroup.

The increase in mimicry observed in both Experiments 1 and 2 was not mediated by the affect that participants were experiencing; the affect that resulted from having been excluded appeared to be independent of mimicry. In Experiment 2, there was also no effect of exclusion on state self-esteem, and state self-esteem did not mediate the increase in mimicry. As predicted, however, belongingness needs were related to mimicry. It was only in the condition where female participants were excluded by their ingroup and interacted with a member of that ingroup that belongingness was related to mimicry, suggesting that individuals' desire to be re-included in their ingroup might have been motivating their mimicry behavior. Although the use of a single measure of belongingness and the absence of inclusion conditions in Experiment 2 complicated the interpretation of the belongingness item results, future research can continue to explore the belongingness motivation for mimicry by including appropriate inclusion comparison conditions, as well as additional measures of belongingness and identity threat.

#### 4.2 Implications for Exclusion Literatures

The results of these experiments have implications for exclusion literatures. First, this research reinforces the idea that being included in groups and being accepted by group members is fundamental; individuals engage in behaviors (i.e., mimicry) that help them to accomplish these goals. Importantly, mimicking the behaviors of others is happening automatically, without conscious awareness or intention. The fact that mimicry is automatic suggests the criticality of the need to belong; the need is so pervasive that if it was not automatic, individuals might not have had enough cognitive resources left to accomplish other important objectives (e.g., locating food, fleeing

predators). Individuals who were able to effortlessly maintain relationships with others may therefore have been more evolutionarily successful at accomplishing *all* of their survival objectives.

Second, this research also demonstrates that pro-social or affiliative behaviors occur after exclusion. The work of Baumeister, Twenge and their colleagues has demonstrated a number of negative behavioral consequences that occur after exclusion (e.g., lower intellectual performance, more aggressive behavior). The work of Williams et al. (2000) provides one alternative to these behavioral patterns by demonstrating an affiliative behavior that occurs after exclusion; participants who were excluded were more likely to conform to incorrect group judgments in a subsequent task. The current research demonstrates another affiliative behavior that occurs after exclusion – nonconscious behavioral mimicry.

The question of why exclusion sometimes leads to anti-social behaviors and sometimes leads to pro-social behaviors still remains. Given the recent interest in exclusion research, many researchers are starting to notice this disparity, and several potential explanations have been offered. Perhaps different types of exclusion lead to different consequences. Baumeister, Twenge, and their colleagues typically manipulate exclusion by giving participants false personality feedback suggesting that they are likely to end up alone later in life, whereas Williams and his colleagues typically use the ball-throwing paradigm that was used in the current studies. To the extent that these rejection experiences are not the same, different behavioral consequences may be anticipated. The manipulation utilized by Baumeister, Twenge, and their colleagues may give participants

a future focus, which makes the exclusion seem more permanent. The manipulation used here and by Williams and his colleagues may seem more temporary and may therefore motivate individuals to engage in behaviors that directly address the threat.

It is also possible that both anti-social and pro-social consequences of exclusion occur, and researchers tap into these differences by measuring the consequences in different ways (Williams, Govan, Case, & Warburton, 2003). For example, the salience of being evaluated by a new interaction partner could determine peoples' responses to exclusion. If people feel that they have a chance to affiliate with a new person and that they are likely to be evaluated by this person, then pro-social behaviors might result. If, on the other hand, participants think that it is unlikely that they will be evaluated or feel that affiliation is not possible, anti-social behaviors may result. It is also possible that the public or private nature of responses could be important. To gain a fuller understanding of the complex behavioral responses that occur after exclusion, these factors will need to be carefully manipulated and the consequences observed.

#### 4.3 Implications for Nonconscious Behavioral Mimicry Literature

The results of the current experiments also have implications for the nonconscious behavioral mimicry literature. Prior research on behavioral mimicry has consistently demonstrated that mimicking the behaviors of others leads to increases in liking and rapport. The current studies extend this research by demonstrating that mimicry may also be a way to directly address threatened belongingness needs. The implications of the link between exclusion, belongingness needs, and mimicry are profound. The nature of the relationship between these variables suggests that individuals may actually be able to

establish themselves in desired groups by mimicking the behaviors of group members. Moreover, they may also be able to re-establish themselves in groups from which they have been excluded by mimicking the behaviors of representative group members. This would suggest that people may be able to regulate group identities through the use of mimicry, which would demonstrate yet another adaptive consequence of effortlessly and unintentionally mimicking the behaviors of others.

From an evolutionary perspective, it is not difficult to see that automatic mimicry has significant adaptive value. As communal living became increasingly important for humans (Brewer, 1997; Caporael & Brewer, 1991), behaviors that allowed individuals to successfully maintain important group relationships would have eventually become widespread throughout the population (for a similar argument, see Cosmides & Tooby, 1992). Given the significance of nonverbal behaviors in communicating important messages to others (DePaulo & Friedman, 1998), these behaviors might have been particularly likely to be influenced by these selective pressures. The consistent link between behavioral mimicry and liking suggests that this behavior may have evolved to serve a “social glue” function, binding people together and creating harmonious relationships. Automatic mimicry is therefore functional at a day-to-day level.

The functionality of behavioral mimicry may be what led to it becoming automatized (Bargh, 1990). To the extent that mimicking the behaviors of others results in benefits for the mimicker, being able to engage in this mimicry behavior using a minimum of cognitive resources would have been even more functional and adaptive. Although there has been debate in the psychological literature about how “smart” the

unconscious is (Greenwald, 1992; Kihlstrom, Barnhardt, & Tatarzyn, 1992; Lewicki, Hill, & Czyzewska, 1992; Loftus & Klinger, 1992), recent research demonstrating that rather sophisticated processes occur at an automatic level indicates that the unconscious *is* flexible and able to adapt to new situations. The results of the current studies further this perspective by showing that automatic mimicry occurs to a greater extent in situations where it is advantageous to the mimicker.

There are several important questions about mimicry that still remain unanswered. First, future research will need to continue to explore the different types of nonconscious behavioral mimicry that exist. Automatic mimicry is thought to be a result of the perception-behavior link, which can explain the baseline level of mimicry that occurs in all of the experimental conditions in the current studies. Yet this baseline level of mimicry can be increased when certain contextual factors are present. Lakin and Chartrand (2003) demonstrated that a goal to affiliate is one such contextual factor. The current studies extend this work by demonstrating that an exclusion experience that threatens belongingness needs is another such factor.

Other factors probably also exist. For example, the identity regulation idea (outlined above) would suggest that group status and group membership may be one set of contextual factors that would affect the level of observed mimicry. In addition, although Experiment 2 did not find evidence of females mimicking a male confederate after having been excluded from a male group, one may still predict that mimicry could occur in this type of situation as a way to restore relationship status. From an evolutionary perspective, getting along with members of an outgroup as important as

males would have been important for females. Under the right circumstances (which may not have been present in Experiment 2), increased mimicry in a male exclusion / male confederate condition could suggest a relationship-restorative function of nonconscious behavioral mimicry.

A second remaining question concerns the relationship between conscious and nonconscious mimicry. The current research focuses on behavioral mimicry that occurs without conscious awareness or intent, but mimicking the behaviors of others can also occur consciously. Just as the desire to affiliate leads to an increase in nonconscious behavioral mimicry, the desire to ingratiate leads to an increase in conformity, which may be conceptualized as one type of behavior matching (Jones & Pittman, 1982; Jones & Wortman, 1973). Specifically, the ingratiation literature demonstrates that one way to gain acceptance from an interaction partner is by conforming to that person's attitudes, opinions, and behaviors (Jones, 1965).

What is the relationship between this conscious "mimicry" and nonconscious mimicry? One similarity concerns when these strategies will be unsuccessful. If conformity is obvious or excessive, then it may have the undesired effect of alienating the interaction partner (Jones, Jones, & Gergen, 1963). Although this idea has not yet been empirically tested in the mimicry literature, mimicking the behaviors of another might be unsuccessful in the same types of circumstances. If people become consciously aware that they are being mimicked (i.e., the mimicry has become excessive enough to be noticed), liking between interaction partners may not increase.

One difference concerns the type of behaviors analyzed. We explored the use of mimicking passive, simple behaviors as a way to create affiliation. Jones and his colleagues typically discussed opinion and attitude conformity, which may be considered behavioral, but not in the same sense as the nonverbal behaviors that are typically used in nonconscious mimicry research (e.g., foot-shaking). Moreover, the attitude conformity research tends to focus on attitudes that are contrary to an individual's own judgment. This issue does not apply to nonconscious mimicry research. Thus, the focus on the types of behaviors mimicked is different in these two literatures (Thelen, Frautschi, Roberts, Kirkland, & Dollinger, 1981).

Finally, when people try to ingratiate themselves with others, they are most likely aware of the strategies they use. They have a lay theory that suggests that conforming is one way to accomplish their objectives. In contrast, people seem to be completely unaware of the relationship between nonconscious mimicry and affiliation. Although there is no empirical research that has explored this idea, if people were explicitly asked about their lay theory, they might report that mimicking the passive behaviors of another is tantamount to mocking that person. This would certainly lead people attempting to affiliate to avoid consciously mimicking others. Although the differences between conscious and nonconscious mimicry was not the focus of the current research, future research should continue to explore this issue.

#### 4.4 Future Directions

There are several directions that can be taken in future research to extend the findings presented in this paper. First, small changes could be made to the existing

paradigm utilized in Experiment 2 to further develop the identity regulation hypothesis. Inclusion conditions could be used as the control comparison, as opposed to a no exclusion condition. In addition, more belongingness threat items could be included, as well as measures of identity to the group and identity threat. Finally, Experiment 2 should be replicated with non-sex-based groups to determine the generalizability of the results.

Larger issues remain to be addressed as well. If identity regulation is a consequence of mimicry, what would happen when people are included by a group they prefer not to be a part of (e.g., an outgroup)? When included by an outgroup, participants may be motivated to establish their preferred group identity. This goal could be accomplished by mimicking an ingroup confederate or not mimicking (perhaps even “anti-mimicking”) an outgroup confederate. If mimicry can establish group identities, then compared to the perception-behavior link baseline, it should increase when a person wants to be included in a particular group and decrease when a person does not want to be included in a particular group.

The attributional issue that arose in Experiment 2 could also be explored further; participants in the male exclusion condition who did not attribute their exclusion to their sex mimicked the confederate (nonsignificantly) more than participants who attributed their exclusion to their sex. This suggests that outgroup exclusion could threaten people under some circumstances. If, for whatever reason, people make an internal attribution for exclusion by an outgroup, increased mimicry may occur. It will be interesting to further explore this issue by manipulating the basis for exclusion by ingroups and outgroups. If a non-group-based attribution is made for outgroup exclusion (e.g., “they

don't like me" as opposed to "they are excluding me because of my group membership"), then mimicry may occur. A study could be conducted that would explore this attributional issue. Specifically, participants could be excluded by an outgroup and told that the exclusion occurred for personal reasons (e.g., the group excluded you because they do not like you or do not yet like you) or for group-based reasons (e.g., the group excluded you because you are a member of an outgroup). Mimicry may occur when participants are excluded by an outgroup and given a personal reason for that exclusion.

Finally, the studies presented here also raise many interesting questions about the relationship between group membership, status, and nonconscious behavioral mimicry. Female and male groups were utilized in Experiment 2 as a simple way to operationalize group membership. As with many demographic classifications (e.g., race), the boundaries of this group are largely unpermeable. It would be interesting to explore the identity regulation hypothesis with group classifications that were less fixed. After having been excluded from a group that is more fluid, people may attempt to affiliate with members of the current ingroup as a way to re-establish their identity. Alternatively, they might also try to affiliate with members of the outgroup in an attempt to create a different group identity. Individuals who leave a permeable ingroup that excluded them may be better off in some situations by attempting to affiliate with outgroup members.

Status may also play a role in observing behavioral mimicry effects. The confederate was of equal status to the participant in the current experiments, but status could be manipulated as an additional variable of interest. Being excluded by a high status group that one is a member of may result in stronger attempts to affiliate than being

excluded by a high status group of which one is not a member. The status of the specific person who could be mimicked may also be important in determining the extent to which mimicry occurs.

#### 4.5 Conclusion

Given the vast amount of research demonstrating the importance of being included in groups and being accepted by group members, it is not surprising that individuals have developed behaviors, even automatic behaviors, that help them accomplish these fundamental goals. The current studies link exclusion experiences to nonconscious behavioral mimicry. This relationship suggests that automatically mimicking the behaviors of others is functional and adaptive, and provides new support for the sophistication of unconscious processes.

APPENDIX A  
EXPERIMENT 1 MATERIALS

## Mental Visualization Questionnaire

The purpose of this research is to determine how well people can mentally visualize situations. Therefore, we would like you to answer some questions about your mental visualization experience.

Please indicate the extent to which you are feeling each of the following emotions right now. Use the following scale:

1	2	3	4	5
Not at all	A little	Moderately	Quite a bit	Extremely
_____	Happy	_____	Excited	_____
_____	Sad	_____	Displeased	_____
_____	Angry	_____	Enthusiastic	_____
_____	Cheerful	_____	Nervous	_____
_____	Lonely	_____	Determined	_____

How much did you enjoy playing Cyberball?

1	2	3	4	5	6	7	8	9
disliked it very much		disliked it somewhat		neither liked nor disliked it		liked it somewhat		liked it very much

In two sentences or less, describe the scene that you were visualizing while playing Cyberball. \_\_\_\_\_

\_\_\_\_\_

Was it easy or difficult to visualize the situation in which you were playing Cyberball?

1	2	3	4	5	6	7	8	9
extremely difficult		somewhat difficult		neither easy nor difficult		somewhat easy		extremely easy

Was it easy or difficult to visualize the other people with whom you were playing Cyberball?

1	2	3	4	5	6	7	8	9
extremely difficult		somewhat difficult		neither easy nor difficult		somewhat easy		extremely easy

On average, do you think the other students who were playing Cyberball would think it was easy or difficult to visualize the situation?

1	2	3	4	5	6	7	8	9
extremely difficult		somewhat difficult		neither easy nor difficult		somewhat easy		extremely easy

How friendly do you think the other students playing Cyberball are?

1	2	3	4	5	6	7	8	9
extremely unfriendly		somewhat unfriendly		neither friendly nor unfriendly		somewhat friendly		extremely friendly

How sociable do you think the other students playing Cyberball are?

1	2	3	4	5	6	7	8	9
extremely unsociable		somewhat unsociable		neither sociable nor unsociable		somewhat sociable		extremely sociable

How likable do you think the other students playing Cyberball are?

1	2	3	4	5	6	7	8	9
extremely dislikable		somewhat dislikable		neither likable nor dislikable		somewhat likable		extremely likable

Approximately how many times did you want to receive the ball? \_\_\_\_\_

Approximately how many times did you actually receive the ball? \_\_\_\_\_

Is there anything else that you would like to say about the mental visualization task that you just completed? \_\_\_\_\_

---

## Photo Description Questionnaire

The purpose of this research is to determine how well people can verbally describe photographs that they have never seen before. Therefore, we would like you to answer some questions about your photo description experience.

Please indicate the extent to which you are feeling each of the following emotions right now. Use the following scale:

1	2	3	4	5
Not at all	A little	Moderately	Quite a bit	Extremely
_____	Happy	_____	Excited	_____
_____	Sad	_____	Displeased	_____
_____	Angry	_____	Enthusiastic	_____
_____	Cheerful	_____	Nervous	_____
_____	Lonely	_____	Determined	_____

How much did you enjoy the Photo Description task?

1	2	3	4	5	6	7	8	9
disliked it very much		disliked it somewhat		neither liked nor disliked it		liked it somewhat		liked it very much

Your partner described 4 photographs. Please provide a brief description of as many of your partner's photographs as you can.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

Was it easy or difficult to describe the photographs?

1	2	3	4	5	6	7	8	9
extremely difficult		somewhat difficult		neither easy nor difficult		somewhat easy		extremely easy

On average, do you think other students who are asked to describe photographs would think it was easy or difficult?

1	2	3	4	5	6	7	8	9
extremely difficult		somewhat difficult		neither easy nor difficult		somewhat easy		extremely easy

---

Please take a moment now to think about your partner – the person who was describing photographs with you.

How friendly do you think this person is?

1	2	3	4	5	6	7	8	9
extremely unfriendly		somewhat unfriendly		neither friendly nor unfriendly		somewhat friendly		extremely friendly

How sociable do you think this person is?

1	2	3	4	5	6	7	8	9
extremely unsociable		somewhat unsociable		neither sociable nor unsociable		somewhat sociable		extremely sociable

How likable do you think this person is?

1	2	3	4	5	6	7	8	9
extremely dislikable		somewhat dislikable		neither likable nor dislikable		somewhat likable		extremely likable

How smoothly would you say your interaction went with this person?

1	2	3	4	5	6	7	8	9
extremely awkwardly		somewhat awkwardly		neither smoothly nor awkwardly		somewhat smoothly		extremely smoothly

How much in common would you guess you have with this person?

1	2	3	4	5	6	7	8	9
nothing in common		not much in common		some things in common		a moderate amount in common		very much in common

Is there anything about the behavior of this person that you noticed or stood out while you were describing the pictures with him or her? \_\_\_\_\_

---

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Do you think that this person is similar to or different from you?

1	2	3	4	5	6	7	8	9
extremely different		somewhat different		neither similar nor different		somewhat similar		extremely similar

Do you think that this person had mannerisms similar to or different from yours?

1	2	3	4	5	6	7	8	9
extremely different		somewhat different		neither similar nor different		somewhat similar		extremely similar

Is there anything else that you would like to say about the photo description task that you just completed? \_\_\_\_\_

---

## Confederate Rating Sheet

Subject Number: \_\_\_\_\_ Date: \_\_\_\_\_ Confederate: \_\_\_\_\_

Did the subject say anything to you that was unrelated to the picture description task? If so, what? \_\_\_\_\_

---

1. How comfortable were you with the subject?

1	2	3	4	5	6	7	8	9
extremely uncomfortable		somewhat uncomfortable	neither comfortable nor uncomfortable			somewhat comfortable		extremely comfortable

2. How likeable was the subject?

1	2	3	4	5	6	7	8	9
extremely dislikable		somewhat dislikable	neither likable nor dislikable			somewhat likable		extremely likable

3. How smoothly would you say your interaction went with the subject?

1	2	3	4	5	6	7	8	9
extremely awkwardly		somewhat awkwardly	neither smoothly nor awkwardly			somewhat smoothly		extremely smoothly

4. How friendly was the subject?

1	2	3	4	5	6	7	8	9
extremely unfriendly		somewhat unfriendly	neither friendly nor unfriendly			somewhat friendly		extremely friendly

5. How much eye contact did the subject make with you?

1	2	3	4	5	6	7	8	9
no eye contact		not much eye contact		some eye contact		a moderate amount of eye contact		a lot of eye contact

6. How much did the subject smile at you?

1	2	3	4	5	6	7	8	9
didn't smile at all								smiled a lot

7. What kind of mood do you think the subject was in?

1	2	3	4	5	6	7	8	9
extremely bad mood		somewhat bad mood		neither good mood nor bad mood		somewhat good mood		extremely good mood

## Funnel Debriefing Form Questions

1. Are you wondering anything about this experiment (the whole thing), or do you have any questions about it?
2. What did you think this experiment was about?
3. When you were playing Cyberball, did anything about that experience stand out to you? (If so, what?)
4. When you were doing the Photo Description task, did anything about that experience stand out to you? (If so, what?)
5. Did your Photo Description task partner have any particular mannerisms that you noticed or that seemed distinctive to you?
6. Did you think that the two experiments you did today were related in any way? (If yes, in what way were they related?)
7. Did anything you did during the first experiment affect what you did in the second experiment? (If yes, how exactly did it affect you?)
8. Did you think that you were actually playing Cyberball with other participants?



Protocol # 2003B0045

**VIDEO RELEASE FORM**

**Visualization and Description**

This study necessitated videotaping participants during a brief portion of the experimental session. The tapes will be coded by raters who will not be given any information on the names or identity of the persons on the videotapes. The posture and mannerisms of the participants will be analyzed (and nothing more). The tapes will not be used for any purpose other than the scientific collection, coding, and analysis of data.

Please sign below to allow the raters to code your data. If you choose not to sign below, it will be assumed that you do not wish to have your data coded, and the portion of video with you on it will be erased.

---

**Date**

---

**Name of Participant**

“I hereby release my videotape footage to the researchers for the sole purpose of coding and analyzing the data contained therein.”

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**Signature of Participant**

If you have any further questions about this study, you can contact Dr. Tanya Chartrand at 292-7175.

APPENDIX B  
EXPERIMENT 1 FIGURE

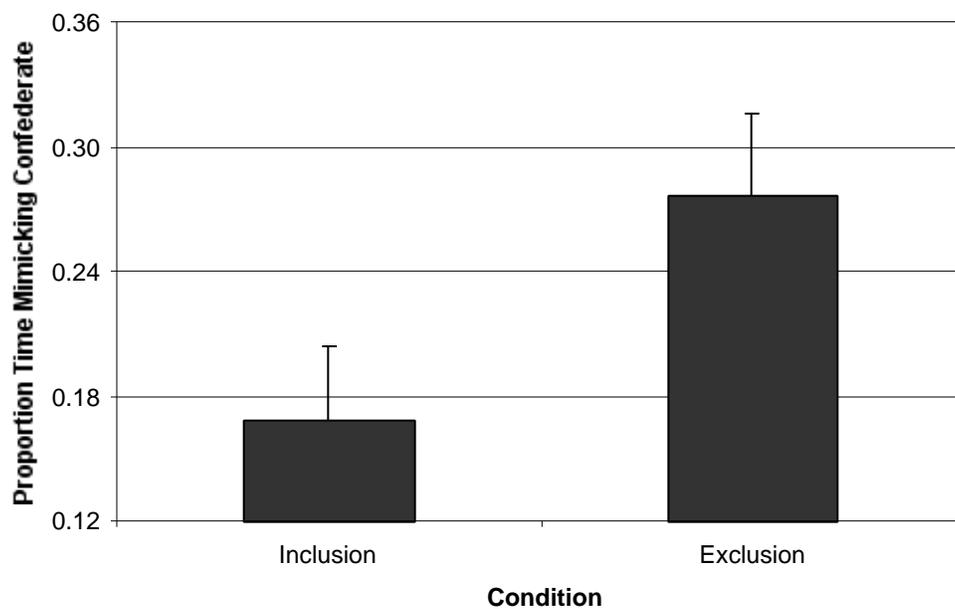


Figure 1: Behavioral mimicry as a function of condition, Experiment 1

APPENDIX C  
EXPERIMENT 2 MATERIALS

## Mental Visualization Questionnaire (Experimental Conditions)

The purpose of this research is to determine how well people can mentally visualize situations and what personality factors may be related to this ability. Therefore, we would like you to answer some questions about your mental visualization experience, and yourself more generally.

---

Please indicate the extent to which you are feeling each of the following emotions right now. Use the following scale:

1	2	3	4	5
Not at all	A little	Moderately	Quite a bit	Extremely
_____	Happy		_____	Content
_____	Sad		_____	Nervous
_____	Angry		_____	Satisfied
_____	Cheerful		_____	Pleased
_____	Lonely		_____	Distressed
_____	Excited		_____	Upset
_____	Displeased		_____	Joyful

Please answer the following questions about your mental visualization experience.

How much did you enjoy playing Cyberball?

1	2	3	4	5	6	7	8	9
disliked it very much		disliked it somewhat		neither liked nor disliked it		liked it somewhat		liked it very much

In two sentences or less, describe the scene that you were visualizing while playing Cyberball. \_\_\_\_\_

---

---

Three other people played Cyberball with you. Please list two adjectives that describes your mental visualization of each:

Player 1 was a (circle one):    MALE                  FEMALE

Two words to describe my picture of Player 1 are:        \_\_\_\_\_        \_\_\_\_\_

Player 2 was a (circle one):    MALE                  FEMALE

Two words to describe my picture of Player 2 are:        \_\_\_\_\_        \_\_\_\_\_

Player 3 was a (circle one):    MALE                  FEMALE

Two words to describe my picture of Player 3 are:        \_\_\_\_\_        \_\_\_\_\_

Was it easy or difficult to visualize the situation in which you were playing Cyberball?

1	2	3	4	5	6	7	8	9
extremely difficult		somewhat difficult		neither easy nor difficult		somewhat easy		extremely easy

Was it easy or difficult to visualize the other people with whom you were playing Cyberball?

1	2	3	4	5	6	7	8	9
extremely difficult		somewhat difficult		neither easy nor difficult		somewhat easy		extremely easy

On average, do you think the other students who were playing Cyberball would think it was easy or difficult to visualize the situation?

1	2	3	4	5	6	7	8	9
extremely difficult		somewhat difficult		neither easy nor difficult		somewhat easy		extremely easy

Please answer the following questions about the other participants who played Cyberball with you.

How friendly do you think the other students playing Cyberball are?

1	2	3	4	5	6	7	8	9
extremely unfriendly		somewhat unfriendly		neither friendly nor unfriendly		somewhat friendly		extremely friendly

How sociable do you think the other students playing Cyberball are?

1	2	3	4	5	6	7	8	9
extremely unsociable		somewhat unsociable		neither sociable nor unsociable		somewhat sociable		extremely sociable

How likable do you think the other students playing Cyberball are?

1	2	3	4	5	6	7	8	9
extremely dislikable		somewhat dislikable		neither likable nor dislikable		somewhat likable		extremely likable

How intelligent do you think the other students playing Cyberball are?

1	2	3	4	5	6	7	8	9
extremely unintelligent		somewhat unintelligent		neither intelligent nor unintelligent		somewhat intelligent		extremely intelligent

How much do you feel you belonged to the group playing Cyberball?

1	2	3	4	5	6	7	8	9
not at all								very much

To what extent do you value the other participants as people?

1	2	3	4	5	6	7	8	9
not at all								very much

To what extent do you think that the other participants value you as a person?

1	2	3	4	5	6	7	8	9
not at all								very much

Finally, please answer the following questions about yourself. For the first set of questions, use the scale provided below.

1	2	3	4	5
Not at all	A little	Moderately	Quite a bit	Extremely

- \_\_\_\_\_ I am an open-minded person.
- \_\_\_\_\_ I am worried about whether I am regarded as a success or failure.
- \_\_\_\_\_ I feel that others respect and admire me.
- \_\_\_\_\_ I feel self-conscious.
- \_\_\_\_\_ I feel displeased with myself.
- \_\_\_\_\_ I feel good about myself.
- \_\_\_\_\_ I am worried about what other people think of me.
- \_\_\_\_\_ I feel confident that I understand things.
- \_\_\_\_\_ I feel inferior to others at this moment.
- \_\_\_\_\_ I appreciate new experiences.
- \_\_\_\_\_ I feel concerned about the impression I am making.
- \_\_\_\_\_ I am worried about looking foolish.
- \_\_\_\_\_ I am spontaneous.

How true is the statement: "Life is meaningless"?

1	2	3	4	5	6	7	8	9
not at all								very much

How true is the statement: "I am in control of my life"?

1	2	3	4	5	6	7	8	9
not at all								very much

Is there anything else that you would like to say about the mental visualization task that you just completed? \_\_\_\_\_

---

## Personality and Emotions Questionnaire (Control Condition)

The purpose of this research is to determine how personality is related to emotions. Therefore, we would like you to answer some questions about yourself.

---

Please indicate the extent to which you are feeling each of the following emotions right now. Use the following scale:

1	2	3	4	5
Not at all	A little	Moderately	Quite a bit	Extremely
_____	Happy		_____	Content
_____	Sad		_____	Nervous
_____	Angry		_____	Satisfied
_____	Cheerful		_____	Pleased
_____	Lonely		_____	Distressed
_____	Excited		_____	Upset
_____	Displeased		_____	Joyful

Please answer the following questions about yourself. Use the scales provided.

To what extent do you think that other people value you as a person?

1	2	3	4	5	6	7	8	9
not at all								very much

1	2	3	4	5
Not at all	A little	Moderately	Quite a bit	Extremely

- \_\_\_\_\_ I am an open-minded person.
- \_\_\_\_\_ I am worried about whether I am regarded as a success or failure.
- \_\_\_\_\_ I feel that others respect and admire me.
- \_\_\_\_\_ I feel self-conscious.
- \_\_\_\_\_ I feel displeased with myself.
- \_\_\_\_\_ I feel good about myself.
- \_\_\_\_\_ I am worried about what other people think of me.
- \_\_\_\_\_ I feel confident that I understand things.
- \_\_\_\_\_ I feel inferior to others at this moment.
- \_\_\_\_\_ I appreciate new experiences.
- \_\_\_\_\_ I feel concerned about the impression I am making.
- \_\_\_\_\_ I am worried about looking foolish.
- \_\_\_\_\_ I am spontaneous.

How true is the statement: "Life is meaningless"?

1	2	3	4	5	6	7	8	9
not at all								very much

How true is the statement: "I am in control of my life"?

1	2	3	4	5	6	7	8	9
not at all								very much

Is there anything else that you would like to say about this questionnaire? \_\_\_\_\_

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## Photo Description Questionnaire

The purpose of this research is to determine how well people can verbally describe photographs that they have never seen before. Therefore, we would like you to answer some questions about your photo description experience.

Please indicate the extent to which you are feeling each of the following emotions right now. Use the following scale:

1	2	3	4	5
Not at all	A little	Moderately	Quite a bit	Extremely
_____	Happy	_____	Content	
_____	Sad	_____	Nervous	
_____	Angry	_____	Satisfied	
_____	Cheerful	_____	Pleased	
_____	Lonely	_____	Distressed	
_____	Excited	_____	Upset	
_____	Displeased	_____	Joyful	

How much did you enjoy the Photo Description task?

1	2	3	4	5	6	7	8	9
disliked it very much		disliked it somewhat		neither liked nor disliked it		liked it somewhat		liked it very much

Your partner described 4 photographs. Please provide a brief description of as many of your partner's photographs as you can.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

Was it easy or difficult to describe the photographs?

1	2	3	4	5	6	7	8	9
extremely difficult		somewhat difficult		neither easy nor difficult		somewhat easy		extremely easy

On average, do you think other students who are asked to describe photographs would think it was easy or difficult?

1	2	3	4	5	6	7	8	9
extremely difficult		somewhat difficult		neither easy nor difficult		somewhat easy		extremely easy

---

Please take a moment now to think about your partner – the person who was describing photographs with you.

How friendly do you think this person is?

1	2	3	4	5	6	7	8	9
extremely unfriendly		somewhat unfriendly		neither friendly nor unfriendly		somewhat friendly		extremely friendly

How sociable do you think this person is?

1	2	3	4	5	6	7	8	9
extremely unsociable		somewhat unsociable		neither sociable nor unsociable		somewhat sociable		extremely sociable

How likable do you think this person is?

1	2	3	4	5	6	7	8	9
extremely dislikable		somewhat dislikable		neither likable nor dislikable		somewhat likable		extremely likable

How intelligent do you think this person is?

1	2	3	4	5	6	7	8	9
extremely unintelligent		somewhat unintelligent		neither intelligent nor unintelligent		somewhat intelligent		extremely intelligent

My partner was a (circle one):        MALE        FEMALE

Two words to describe my partner are: \_\_\_\_\_

How smoothly would you say your interaction went with this person?

1	2	3	4	5	6	7	8	9
extremely awkwardly		somewhat awkwardly	neither smoothly nor awkwardly			somewhat smoothly		extremely smoothly

How much in common would you guess you have with this person?

1	2	3	4	5	6	7	8	9
nothing in common		not much in common	some things in common			a moderate amount in common		very much in common

Is there anything about the behavior of this person that you noticed or stood out while you were describing the pictures with him or her? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Do you think that this person is similar to or different from you?

1	2	3	4	5	6	7	8	9
extremely different		somewhat different	neither similar nor different			somewhat similar		extremely similar

Do you think that this person had mannerisms similar to or different from yours?

1	2	3	4	5	6	7	8	9
extremely different		somewhat different	neither similar nor different			somewhat similar		extremely similar

Is there anything else that you would like to say about the photo description task that you just completed? \_\_\_\_\_

\_\_\_\_\_

## Confederate Rating Sheet

Subject Number: \_\_\_\_\_ Date: \_\_\_\_\_ Confederate: \_\_\_\_\_

Did the subject say anything to you that was unrelated to the picture description task? If so, what? \_\_\_\_\_

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2. How comfortable were you with the subject?

1	2	3	4	5	6	7	8	9
extremely uncomfortable		somewhat uncomfortable	neither comfortable nor uncomfortable			somewhat comfortable		extremely comfortable

2. How likeable was the subject?

1	2	3	4	5	6	7	8	9
extremely dislikable		somewhat dislikable	neither likable nor dislikable			somewhat likable		extremely likable

3. How smoothly would you say your interaction went with the subject?

1	2	3	4	5	6	7	8	9
extremely awkwardly		somewhat awkwardly	neither smoothly nor awkwardly			somewhat smoothly		extremely smoothly

4. How friendly was the subject?

1	2	3	4	5	6	7	8	9
extremely unfriendly		somewhat unfriendly	neither friendly nor unfriendly			somewhat friendly		extremely friendly

5. How much eye contact did the subject make with you?

1	2	3	4	5	6	7	8	9
no eye contact		not much eye contact		some eye contact		a moderate amount of eye contact		a lot of eye contact

6. How much did the subject smile at you?

1	2	3	4	5	6	7	8	9
didn't smile at all								smiled a lot

7. What kind of mood do you think the subject was in?

1	2	3	4	5	6	7	8	9
extremely bad mood		somewhat bad mood		neither good mood nor bad mood		somewhat good mood		extremely good mood

8. How much do you think that the subject mimicked your foot-shaking?

1	2	3	4	5	6	7	8	9
didn't mimic at all								mimicked a lot

### **Funnel Debriefing Form Questions (Experimental Conditions)**

1. Are you wondering anything about this experiment (the whole thing), or do you have any questions about it?
2. What did you think this experiment was about?
3. Did you think that the two experiments you did today were related in any way? (If yes, in what way were they related?)
4. Did anything you did during the first experiment affect what you did in the second experiment? (If yes, how exactly did it affect you?)
5. When you were playing Cyberball, did anything about that experience stand out to you? (If so, what?)

#### **IF SHE MENTIONS EXCLUSION:**

6. Why do you think that happened?
7. When you were doing the Photo Description task, did anything about that experience stand out to you? (If so, what?)
8. Did your Photo Description task partner have any particular mannerisms that you noticed or that seemed distinctive to you?
9. When you were playing Cyberball, did you think that you were actually playing with other participants?

#### **IF SHE DOES NOT MENTION EXCLUSION:**

6. When you were doing the Photo Description task, did anything about that experience stand out to you? (If so, what?)
7. Did your Photo Description task partner have any particular mannerisms that you noticed or that seemed distinctive to you?
8. I would like to ask you a few more questions about the Cyberball game. Did you receive the ball more often or less often than the other players? Why do you think that happened?
9. When you were playing Cyberball, did you think that you were actually playing with other participants?

### **Funnel Debriefing Form Questions (Control Condition)**

1. Are you wondering anything about this experiment (the whole thing), or do you have any questions about it?
2. What did you think this experiment was about?
3. Did you think that the two experiments you did today were related in any way? (If yes, in what way were they related?)
4. Did anything you did during the first experiment affect what you did in the second experiment? (If yes, how exactly did it affect you?)
5. When you were doing the first experiment, did anything about that experience stand out to you? (If so, what?)
6. When you were doing the Photo Description task, did anything about that experience stand out to you? (If so, what?)
7. Did your Photo Description task partner have any particular mannerisms that you noticed or that seemed distinctive to you?



Protocol # 2003B0045

**VIDEO RELEASE FORM**

**Visualization and Description**

This study necessitated videotaping participants during a brief portion of the experimental session. The tapes will be coded by raters who will not be given any information on the names or identity of the persons on the videotapes. The posture and mannerisms of the participants will be analyzed (and nothing more). The tapes will not be used for any purpose other than the scientific collection, coding, and analysis of data.

Please sign below to allow the raters to code your data. If you choose not to sign below, it will be assumed that you do not wish to have your data coded, and the portion of video with you on it will be erased.

---

**Date**

---

**Name of Participant**

“I hereby release my videotape footage to the researchers for the sole purpose of coding and analyzing the data contained therein.”

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**Signature of Participant**

If you have any further questions about this study, you can contact Dr. Tanya Chartrand at 292-7175.

APPENDIX D  
EXPERIMENT 2 FIGURE

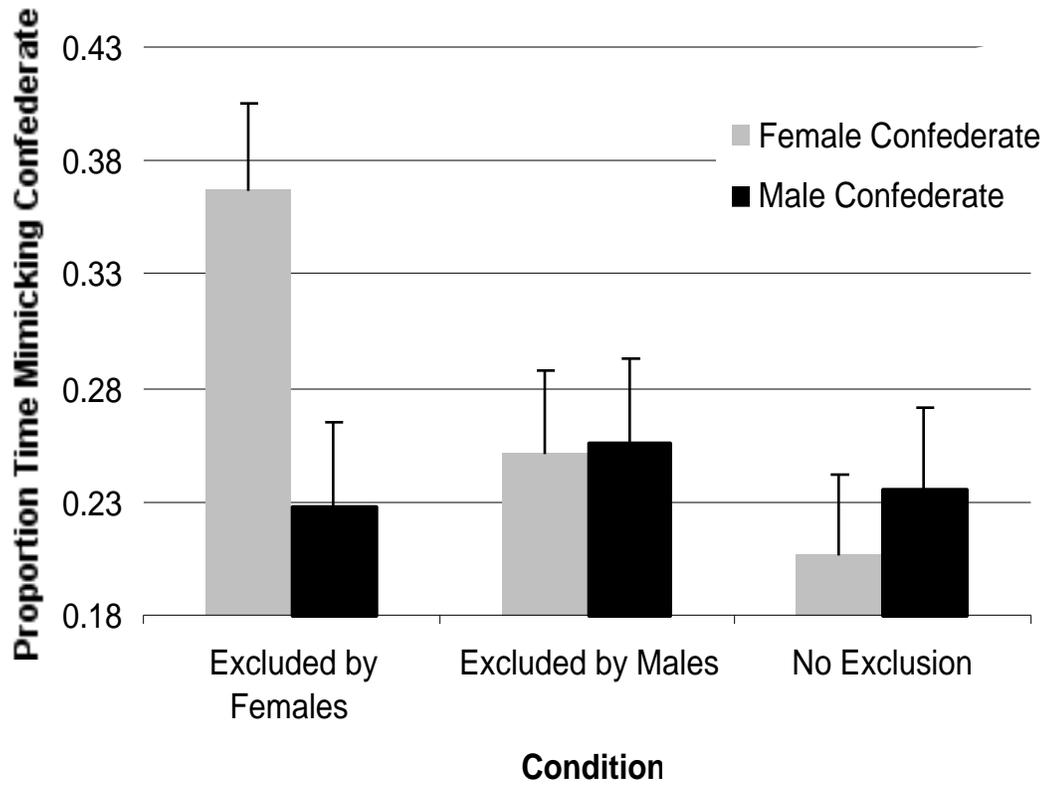


Figure 2: Behavioral mimicry as a function of condition and sex of confederate, Experiment 2

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## ENDNOTES

<sup>1</sup> There is abundant evidence to suggest that females think of other females as an ingroup and males as an outgroup. First, sex is a fundamental category (along with race and age) that people use to categorize others (Fiske, 1998). From a very young age, children are aware of sex distinctions and use the labels correctly when classifying people (Yee & Brown, 1994). This suggests that sex groups are categories that people are almost always aware of and willing to use when thinking of others. Taken with research on the minimal group paradigm, which demonstrates that people instantaneously form bonds with people who are categorized into the same group (Brewer & Silver, 1978; Tajfel, Billig, Bundy, & Flament, 1971), the fundamental nature of sex groups suggests that females will think of other females as ingroup members. Second, research on social comparison theory has demonstrated that people prefer to socially compare with similar others and proximal others (Festinger, 1954), but the preference for comparing with similar others is so strong that people will compare with distant similar others over close, less-similar others. Thus, it is particularly telling that females who work in male-dominated occupations socially compare with other women, even though men would be closer (Crosby, 1982). At a minimum, this suggests that women feel more similar to other women. The research of Crocker and Major (1989) demonstrates that this social comparison pattern is particularly

evident in stigmatized groups (like women in male-dominated occupations), because comparing with other ingroup members (i.e., females) is more informative than comparing with outgroup members (i.e., males). Thus, females must be thinking of other females as ingroup members. Finally, Park and her colleagues (Park & Rothbart, 1982; Park, Ryan, & Judd, 1992) have demonstrated that people are aware of more subgroups for their ingroups than they are for their outgroups. Consistent with the idea that females think of other females as an ingroup, females are aware of more subgroups for the category of females than the category of males (Richards & Hewstone, 2001).