EFFECT OF CONTEXT ON MIMICRY AND EMOTIONAL CONTAGION: DOES

DISLIKING INHIBIT MIMICRY AND EMOTIONAL CONTAGION?

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By

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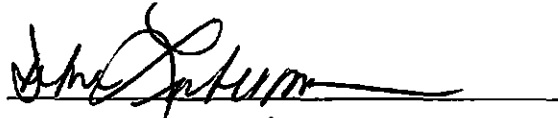
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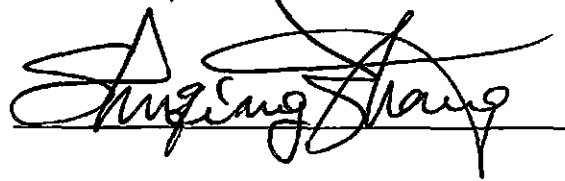
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We certify that we have read this thesis and that, in our opinion, it is satisfactory in scope and quality as a thesis for the degree of Master of Arts in Psychology.

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ABSTRACT

Previous research on mimicry suggests that this process occurs automatically in response to perception of a behavior or emotion. However, there is evidence that goals such as liking or having a desire to affiliate with another may affect mimicry of that person. This study tested the hypothesis that encountering a socially undesirable person will inhibit mimicry and contagion while encountering a highly socially desirable person will enhance mimicry and contagion. Participants were induced to dislike, feel neutral about, or like another person. They were then shown videos of that person recounting either a sad or happy story. Participants' reactions to the videos were taped and coded for mimicry. They also rated their own level of happiness after both the sad and happy stories. In partial confirmation of the hypothesis, results showed that for sad emotions, disliking the target caused significantly less mimicry than feeling neutral about the target while liking the target caused significantly more contagion than feeling neutral about the target. However, contrary to the hypothesis, those who felt neutral mimicked the most and felt the least contagion. For the happy video, there was no effect of likeability condition on mimicry and contagion.

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CHAPTER 1

INTRODUCTION

During social interactions, people tend to imitate each others' postures,

mannerisms, vocal expressions, and emotions. The tendency for individuals to imitate

each others movements and expressions – mimicry – and the tendency to experience, and

thus mimic, each others emotions – emotional contagion – are well-known, pervasive

social phenomena (for reviews see Chartrand, Maddux, & Lakin , 2005; Hatfield,

Caccioppo, & Rapson, 1992). It has been suggested mimicry and emotional contagion are

ubiquitous because people automatically imitate whatever they perceive (Chartrand &

Bargh, 1999; James, 1890). However, certain studies have found evidence of context

dependent mimicry and contagion where the context can enhance or inhibit these

processes (for reviews see Chartrand et al., 2005; Hatfield et al., 1992); Furthermore, one

study in particular found counter-mimicry and contagion (Lanzetta & Englis, 1989),

suggesting that we don't just mimic whatever we perceive.

So when do we mimic others? One way to approach this question is to ask what

function mimicry might serve. Evolutionary psychologists have suggested that mimicry

may serve the adaptive function of aiding social survival; that mimicry is social glue

binding people together (Chartrand et al., 2005; Lakin & Chartrand, 2003; Lakin, Jefferis,

Cheng & Chartrand, 2003). The research showing a positive correlation between mimicry

and liking suggests that there is support for this theory (Chartrand & Bargh, 1999;

Chartrand et al., 2005; for a review see Hatfield et al., 1992). If mimicry serves the

purpose of rapport-building, then in the context in which we do not desire to build rapport

with another, would we avoid mimicking that person's behaviors or emotions? Or is

perception of another's behavior enough to cause mimicry and emotional contagion to occur regardless of our evaluation of that person? The goal of this research is to better understand the nature of mimicry and emotional contagion by observing these two social phenomena in the context where disliking an insignificant other occurs.

*Theoretical Background*

*Mimicry as an automatic process.* Several theorists have suggested that the act of perceiving, imagining, or mentally representing a behavior will excite the motor programs necessary for the activation of that behavior, thus causing imitation of that behavior (Chartrand & Bargh, 1999; Chartrand et al., 2005; James, 1890, Jeannerod, 1994; Prinz, 1997). Neuropsychological research has found that common neural networks are activated both when perceiving and executing a movement, both in humans and in certain primates (Gallese, Fadiga, Fogassi, & Rizzolatti, 1996; Rizolatti, Fadiga, Fogassi, & Gallese, 1996). Studies with humans have shown that these "mirror neurons" create interference in participants' behavior when participants are told to perform a behavior while perceiving an incongruent behavior (Brass, Bekkering, & Prinz, 2001; Craighero, Bello, Fadiga, & Rizzolatti, 2002; Kilner, Paulignan, & Blakemore, 2003). Specifically, participants performed the requested behavior significantly slower when they saw an incongruent behavior than when they saw a congruent behavior. This interference occurred whether or not the perceived behavior was goal-directed (e.g. a hand grasping an object versus a hand grasping nothing) (Brass et al., 2001; Craighero et al., 2002; Kilner et al., 2003), but did not occur when the perceived behavior was performed by a robot (Kilner et al., 2003). These results suggest that, in humans, there may be mirror

neurons that respond specifically to biological motion whether or not the motion is goal-directed.

Social psychologists have also studied the automatic nature of mimicry and found much evidence to support this hypothesis (for reviews see Chartrand et al., 2005; Hatfield et al., 1992). Chartrand & Bargh (1999) have labeled the process responsible for this tendency as the perception-behavior link: perception of *any* behavior increases the likelihood that the perceiver will perform the behavior. There is indeed evidence that people will automatically mimic what they see without knowing it, including unfamiliar others, and not realize when they are being mimicked in return (Chartrand & Bargh, 1999; Lakin & Chartrand, 2003; Neumann & Strack, 2000; van Baaren, Maddux, Chartrand, de Bouter, & van Knippenberg, 2003). There is evidence that this automatic mimicry is also innate (Field, Woodson, Greenberg & Cohen, 1982; Meltzoff & Moore, 1977, 1983; Termine & Izard, 1988). Newborns mimic motor behaviors shortly after birth (Meltzoff & Moor, 1977) and their mother's facial expressions after 10 weeks of age (Haviland & Lelwica, 1987).

This automatic mimicry for adults and infants occurs in many types of forms including (but not limited to) postural, facial, emotional, and motor mimicry (for a review see Hess, Blairy, Philippot, 1999). Studies on mimicry of facial expressions have shown that mimicry occurs rapidly and for different types of stimuli (Chartrand & Bargh, 1999; Hsee, Hatfield, Carlson, & Chemtob, 1990; Wild, Erb, & Bartels, 2001). Participants will mimic facial expressions when shown pictures lasting only 500 ms (Wild et al., 2001); when shown someone on a video lasting several minutes (Hsee et al., 1990); and when participants are in the presence of a confederate who is smiling (Chartrand and Bargh,

1999, study 1). Termine and Izard (1988) found that infants can mimic mothers' facial expressions of happiness, sadness, and anger. There is also strong evidence that people mimic many types of behaviors, such as postures (La France, 1979, 1982; La France & Broadbent, 1976), face rubbing, foot shaking (Chartrand & Bargh, 1999), yawning (Estow, Jamieson, & Yates, 2007), and ducking (Bavelas, Black, Chovil, Lemery, and Mullett, 1988).

*Goal-directed mimicry.* Some theorists, however, have suggested that mimicking everything we see is not necessary and potentially problematic (Rizzolatti, Fogassi, & Gallese, 2001; Blakemore & Frith, 2005). Although there is evidence that the system is at least geared up to imitate perceived behavior (cf. Jeannerod, 1994), it is necessary to make the distinction between a system that is prepared to perform an action (as seen by mirror neurons) and a system that actually does perform the action (as seen by observable mimicry). Blakemore and Frith (2005) make the point that "there is contagion by which the motor system of the observer is primed to produce the movement observed and there is affordance by which the motor system of the observer is primed to interact efficiently with the object." So the priming of the system by motor contagion allows individuals to get information from the environment; but their subsequent behavior may not match the observed behavior because the individuals have modified this behavior through their inferences, intentions, and the need to interact efficiently with the environment.

There is evidence that supports the argument that goals can moderate the automatic effect of the perception-behavior link on mimicry (for a review see Chartrand et al., 2005; Hatfield et al., 1992). For example, Van Baaren, Fockenberg, Holland, Janssen, and Ad van Knippenberg (2006) found that different moods change the amount

of behavior matching with positive moods enhancing mimicry and negative moods

inhibiting mimicry. The desire to affiliate with someone has been shown to increase

mimicry as well (Lakin & Chartrand, 2003). One study even demonstrated counter

mimicry: participants who engaged in competition exhibited counter mimicry while those

who engaged in cooperation exhibited mimicry (Lanzetta & Englis, 1989). But of specific

interest to this study is a context whose positive correlation with mimicry suggests that it

too can enhance and inhibit mimicry, the context of liking and desiring to build rapport

with another.

*Association of mimicry and rapport.* The idea that mimicry and rapport are related

came from a seminal paper written by Albert Sheflen (1964) about the significance of

postural configurations between interacting partners as this unconscious synchrony can

indicate affiliation and similarity between people. Since then, much evidence has

accumulated that mimicry and rapport are indeed related (see Chartrand et al., 2005;

Hatfield et al., 1992). For example, couples who had been together for 25 years were

rated, from photographs, as being more physically similar to each other than when they

were newlyweds; furthermore, the ratings of similarity were also associated with reported

marital happiness (Zajonc, Adelmann, Murphy, and Niedenthal, 1987). Zajonc and his

collegues (1987) posited that sharing emotions over the years increased resemblance of

the long-married couples. Chartrand and her collegues (2005) suggested that the older

couples looked alike because they had more chances to mimic one another and thus had

similar facial lines. Mimicry of postures and mannerisms has also been related to rapport

and liking (Bernieri, 1988; Dabbs, 1969; LaFrance, 1982; LaFrance & Broadbent, 1976;

Scheflen, 1964). LaFrance (1982) found that students' ratings of rapport with a teacher

were correlated with the amount the students mimicked the posture of that teacher. Bernieri (1988) also found that when two strangers interacted, dyads whose movements were most in sync with one another also felt more rapport than dyads out of sync with each other. This evidence seems to support the notion that mimicry and liking are indeed related.

However, these studies are correlational, so confirming that liking actually *causes* increased mimicry is yet to be determined. One study did use a cross-lag panel technique, measuring rapport and posture sharing at two different times (LaFrance, 1979). They found that posture sharing at Time 1 was more highly correlated with rapport at Time 2 ($r$ = .77) than rapport at Time 1 was correlated with posture sharing at Time 2 ($r$ = .58); however, the difference between the two correlations was not significant. The causal direction of increased mimicry leading to increased liking was tested by Chartrand and Bargh (1999). They had a confederate either mimic or not mimic participants, and results showed that those who were mimicked reported liking the confederate more than the one's who weren't. Although this is evidence that mimicry leads to liking, no evidence exists for the other direction. Does liking lead to mimicry? If the answer is yes, then why would this be so?

*Mimicry for social survival.* Adaptive theorists have posited that mimicry is related to liking because mimicry is a tool used for social survival (e.g. see Chartrand et al., 2005; Lakin et al., 2003). For example, mimicry of another person may indicate that we are similar to that person and that we feel what the other feels. When living in small social groups, like the ones of the evolutionary environment of our ancestors, keeping actions and emotions in accordance with those of the same social group would have been

highly beneficial because the costs of disharmony could lead to isolation and less chance of survival (Lakin et al., 2003). So the more one is liked, the better the chances the individual has of also being fed, protected, and sheltered. This theory predicts that having a desire to affiliate with another should enhance behavioral mimicry of that person. Researchers have found that when participants are primed with a goal to affiliate either consciously (i.e., "you will be interacting with this person as part of a cooperative task in which it is important to get along and work well together") or nonconsciously (i.e., subliminal words related to affiliation: "affiliate", "together"), those participants mimicked more than the ones with no goal to affiliate (for conscious-affiliation-goal, $\eta^2 =$ .11; for nonconscious-affiliation-goal, $\eta^2 = .16$; Lakin & Chartrand, 2003). Furthermore, after priming participants with an affiliation goal, the ones who failed to affiliate with a first confederate mimicked the behaviors of a second confederate more than participants who were successful at achieving the affiliation goal with the first confederate ($\eta^2 = .37$; Lakin & Chartrand, 2003). Evidence that mimicry increases prosocial behavior also suggests that mimicry plays an important role in social situations (Van Baaren, Holland, Kawakami, & Ad van Knippenberg, 2004).

If mimicry serves an adaptive function by signaling liking and rapport, then encountering a socially undesirable person should inhibit mimicry of that person. For example, if a person is exposed to someone of a different social group or an irrelevant member of one's own social group, and the interaction is a negative one that causes dislike to occur, then mimicking that person would be disadvantageous because it would essentially send the wrong signals (i.e. mimicry sends the message of liking and feeling rapport with that person, when actually one feels dislike and no rapport). Also, one would

not want to mimic a disliked person because one has no desire to affiliate with the other and "in general (but with some notable exceptions), the more distant and adversarial the relationship, the more harmful it is" to share information by affiliating with the disliked other (Cosmides & Tooby, 2000).

*Mimicry and emotional contagion.* Hatfield and her colleagues (1992) define emotional contagion as "the tendency to automatically mimic and synchronize facial expressions, vocalizations, postures, and movements with those of another person, and, consequently, to converge emotionally" (Hatfield et al., 1992, p. 153-154). Evidence for the existence of emotional contagion exists for happiness and sadness (Dimberg & Lundqvist, 1990; Estow et al., 2007; Hess & Blairy, 2001; Hsee et al., 1990; Lundqvist & Dimberg, 1995; Wild et al., 2001); with some studies finding more contagion for sadness than happiness. It has been proposed that mimicking another's facial expressions can lead us to "catch" that person's emotions because mimicking facial expressions provides the emotional arousal information specific to that emotion, thus causing that emotion to be felt as well (see Hatfield et al., 1992). So to some extent, the mimicry of facial expressions is the visible sign that emotional contagion is occurring (Hatfield et al., 1992). In fact, research has shown that when subjects are told to make facial expressions they begin to feel those emotions (Adelmann & Zajonc, 1989; Bush, Barr McHugo & Lanzetta 1989). However, research has failed to find a link between mimicry and emotional contagion (Gump & Kulik, 1997; Blairy, Herrera, & Hess, 1999; Hess & Blairy, 2001). For example, one study found that when subjects viewed pictures of emotional expressions, they mimicked the expressions of happy, sad, and anger but only

experienced contagion for happy and sad (Hess & Blairy, 2001). Furthermore, the

authors claimed that their analyses resulted in no association between mimicry and

contagion.

The research findings that women tend to be more facially expressive than men

but not more susceptible to contagion than men also challenges the existence of a link

between mimicry and contagion (for an extensive review, see Kring & Gordon, 1998).

Specifically, research shows that when men and women *report* their susceptibility to

emotional contagion, there is a significant difference with women reporting more

susceptibility than men (Doherty et al., 1993; cf. Hatfield et al., 1992). Yet, when men

and women actually *experience* emotional pictures or film clips, there is no significant

difference between their experienced emotional contagion, as measured either through

their self-reported emotions or judges' ratings of the participants' emotions (Hsee et al.,

1990; Wild et al., 2001; Dimberg & Lundqvist, 1990; Lundqvist & Dimberg, 1995). This

evidence suggests either (1) that men have a different mechanism exciting emotional

contagion than women or (2) that mimicry does not excite contagion for either men or

women.

*Limitations of Previous Research on Dislike and Mimicry*

One study has examined the possible effects of a negative attitude towards

another on mimicry of emotions (McHugo, Lanzetta, Sullivan, Masters, & Englis, 1985).

McHugo and his colleagues (1985) examined the emotional reactions of participants who

watched videos of President Reagan. They measured participants' general attitude

towards the President by asking them how negative or positive they felt toward the

President. The study used self-report measures of eight emotions as well as physiological

measures (facial EMG, skin resistance level, and heart rate) to measure participants' emotional mimicry of the president. They found that participants self reports of emotion depended on their attitudes toward the President; although their attitudes did not affect autonomic or facial muscle responses. Specifically, participants who reported negative attitudes toward the President did not report sharing his emotions, but their physiological responses were similar to those who reported positive attitudes toward the President. Further analyses are needed to better understand the somewhat ambiguous results of this study.

Another study by Chartrand and Bargh (1999) also attempted to create a situation where a participant would have no desire to affiliate or create rapport. Their two confederates were instructed not to make eye-contact or smile at the participant during the session; furthermore, one of the confederates was instructed not to smile at all and to appear sullen, negative and bored. They found that participants still mimicked the mannerisms (face touching and foot shaking) of both confederates. They explain their findings as evidence for the "default tendency" to want to affiliate with others as well as evidence for the unconscious nature of mimicry. However, one could argue that their manipulation was not strong enough to create a sense of dislike or a desire not to affiliate with the confederate. Maybe the participants even shared the bored attitude of the confederate. Whether or not people mimic someone they have deemed socially undesirable remains unclear.

*The Present Study*

The first purpose of this study was to examine (1) whether changes in likeability for another person can cause changes in mimicry of that person, and (2) if this effect is

linear in nature with increasing likeability causing increasing mimicry. The second purpose of this study was to assess the supposed relationship between mimicry and emotional contagion and to see whether this relationship depends on gender. The third purpose was to ensure that the effect of the likeability manipulation was maintained throughout the study by assessing likeability immediately after the manipulation (T1) and after watching the target tell an emotional story (T2).

*Hypotheses*

This experiment addressed several hypotheses:

1. The more we like an individual, the more we will mimic that individual and the more we will tend to catch that individual's emotions.

2. If facial mimicry is one mechanism responsible for emotional contagion, then there should be a positive relationship between facial mimicry and emotional contagion. This relationship should be stronger for women than men because women are more facially expressive but not more susceptible to contagion.

3. People may change their ratings of a person's likeability after watching that person tell an emotional story. This change in likeability for another may occur differently depending on type of emotional story.

CHAPTER 2

METHODS

*Participants*

One hundred and sixty participants from various University of Hawaii at Manoa

undergraduate psychology classes participated in this experiment for extra credit during

fall semester of 2007. A total of 16 participants were dropped from the analyses because

of a failure to read and follow the directions. The resulting sample had a total of 144

participants, 97 women and 47 men, with ages ranging from 17 to 34 (modal age = 19).

The overall sample included a diverse range of ethnic backgrounds with with 39.6%

mixed-Asian, 31.3% Asian, 20.8% Caucasian, 5.55% Pacific Islander, 2.1% Hispanic,

0.7% African-American. The study was approved by the IRB of the University of Hawaii

at Manoa, and all students signed an informed consent form.

*Design*

This experiment contained a likeability condition (3 levels: dislikeable, neutral,

likeable) and an emotional story condition (2 levels: sad and happy). The impact of

likeability was analyzed separately for each emotional story, resulting in two 1-way

ANOVAS for the effect of likeability: one ANOVA for the sad emotional story and a

separate ANOVA for the happy emotional story. These analyses were run separately for

emotional story type because contagion has been found to occur differently for sad and

happy stories. Participants were randomly assigned to emotional story condition and

likeability condition. The sad emotional story condition contained a total of 66

participants ($N_{Dislikable}$ = 22, $N_{Neutral}$ = 23, and $N_{Likeable}$ = 21) while 78 participants ended

up in the happy story condition ($N_{Dislikable}$ = 30, $N_{Neutral}$ = 22, $N_{Likeable}$ = 26). The main

dependent variables of interest were the amount of facial and behavioral mimicry based on participants' videotapes and amount of emotional contagion based on self-report levels of happiness.

*Materials*

The first part of the experiment was performed on a computer using SuperLab version 4.0. Two video cameras were used to capture participant mimicry of the target: one to videotape the participants' faces and the other to video tape the computer screen that the participant was viewing at the time. The two cameras had the same time code, and the event on the screen was matched to the actions of the participants. The second part of the experiment consisted of a brief pen and paper survey, described more in detail below.

*Manipulation.* Participants first were told that they might have to interact with someone for the experiment. If so, they would be allowed to choose their partner. Giving them a choice of partner was designed to allow participants to feel free to dislike the target and maintain a goal to not affiliate with the target. If, instead, participants had been forced to work with someone, their goal to affiliate and like the person may have been activated. To help them choose and manipulate likeability, they received comments about the target with the cover story that these comments were made by the person's previous lab partners. The comments either described the potential partner as a mean person and lazy partner, an average person and a so-so partner, or a nice person and hardworking partner. The statements for the desirable and undesirable lab partner were written so that they paralleled each other in construction but were opposite in meaning. For example, the mean person was described as "I think he/she gets a kick out of making others feel bad,"

and the nice person was described as "I think he/she likes making people feel good about themselves." The neutral person was described in an average manner so that the target was not deemed a highly desirable or undesirable lab partner. These statements were meant to create feelings in the participant of dislike, neutrality, and like for the target, as well as either a desire not to interact, a neutral desire (could care less) to interact, or a desire to interact with the target (see Appendix B).

*Manipulation check.* To increase the credibility of the cover story and to check the effectiveness of the manipulation, participants answered questions rating the likeability and desirability of the partner as a coworker. Evaluations were made via the Reysen Likeability Scale (Reysen, 2005). This 11 item scale asked participants to rate from 1 (very strongly disagree) to 7 (very strongly agree) how much they agreed with statements measuring the likeability of the target person. Higher scores indicated higher likeability of the target. To this author's knowledge, The Reysen Likeability Scale is the first likeability scale to be published. The scale demonstrates good internal consistency (Cronbach's standardized reliability coefficient = 0.90) with one underlying factor as well as possessing good convergent and divergent validity.

The first two questions of the Reysen Likeability Scale were (1) "I would like this person as a coworker" and (2) "This person is likable", in that order. The remaining nine items were presented in a random order. The purpose of fixing the order of the first two questions was to maintain the credibility of the cover story by asking participants if they would like to work with the described lab partner immediately after showing them the comments.

*Emotional stories.* To assess mimicry and contagion of a disliked other, participants were shown emotional videos of the target. The cover story for the videos indicated that the video tapes came from a meeting that the student (the target) had with the professor about a grade. They were also told that the videos had no sound to ensure the privacy of the student. In actuality, the sound was muted to control for differences in the content of each emotional story. The reason why real emotional stories were chosen over scripted, acted stories was because the researcher wanted the emotions to appear strong and genuine.

The emotional stories were provided by both a man and woman target. These videos were chosen based on their overall emotional quality which was pre-rated on a scale from 1 (not at all) to 7 (very) for happiness, sadness and overall expressivity. Both sad and happy videos came from the same individual to control better for individual differences in emotional expressivity. During the emotional videos the targets performed motor behaviors such as touching their faces, nodding their heads, or shifting their postures. During the experiment, each participant saw only one of the emotional stories (sad or happy) from one of the targets (male or female). Each emotional story lasted approximately 40 seconds.

*Behavioral mimicry score.* The *targets'* emotional videos were then coded by the researcher for instances of smiles (for happy stories), frowns (for sad stories), face touches, head tilts, and posture movements with the time of each event marked relative to the beginning of the tape. Six events or "mimicry opportunities" were chosen from each video. The author, blind to condition, then coded each *participant's* reactions to the emotional stories. All events (smiles, frowns, face touches, head nods, and postural

movements) were recorded for time of occurrence. The time of participant event plus one second (to allow time for mimicry and control for error of recording time) was matched to the time of the six chosen mimicry opportunities with achieved opportunities receiving one point, and then the matches were summed for a total mimicry score. Separate totals were also found for motor mimicry and facial mimicry. This coding yielded three dependent variables: a motor mimicry score, a facial mimicry score, and a total mimicry score.

*Measure of emotional contagion.* Immediately after viewing the emotional stories, participants answered questions to assess their emotional contagion of the targets' emotions (Appendix C): three questions for happiness (happy, cheerful, pleasant), three questions for sadness (sad, depressed, unpleasant), and four fillers (tired, relaxed, active, stressed). The participants rated on a scale ranging from 0 (not at all) to 9 (very strongly) how much they felt each emotion at that moment. The four fillers were adjectives representing arousal – calm states and were given as diversions to reduce the possibility that participants were aware that the researcher was interested in measuring emotional contagion. A similar approach was used by Hess and Blairy (2001): they used an adaptation of a questionnaire meant to target a participant's well-being with questions describing a variety of physical sensations. These questions included several arousal-calm questions as well as some emotional questions.

The overall happiness ratings (happy, cheerful, pleasant) were combined to form the contagion score with the prediction that higher levels of self-reported happiness would occur after witnessing the happy story and lower levels of self-reported happiness would occur after witnessing the sad story. It was deemed better to not combine ratings

from the happy and sad scales for an overall emotional contagion score because if

greater variability exists for self-reported happiness than sadness, then the results will be

biased in favor of the scale with the larger variance. So only the emotion of happiness

was chosen to measure contagion with happiness measured three ways (cheerfulness,

pleasantness, and happiness).

*Survey*. Finally students filled out a brief paper and pen survey that gave the

Reyson Likeability Scale (Reyson, 2005) again to assess if likeability changed after

seeing the target act emotionally. The survey also contained demographic questions

asking gender, ethnicity, and age (Appendix D).

*Post-experiment interview.*. The first 50 participants were interviewed after the

experiment to assess if they had guessed the purpose of the experiment. However, none

of the participants deduced that the experiment aimed to measure emotional contagion or

mimicry (Appendix E).

*Procedure*

Participants were interviewed, one at a time. When they arrived at the lab, they

were greeted by the researcher and given a consent form. While participants read and

signed the consent form, the video cameras were turned on, and the computer part of the

experiment was set up. The researcher or her assistants informed the participants that

there were two parts to the experiment. This explanation was given to add validity to the

cover story for the manipulation, which stated that participants might have to interact

with someone for the experiment. Participants were then told to wait until the

experimenter had left the room to start the experiment. Then participants read the

instructions, the cover story, and the five statements about a potential future lab partner.

After reading the statements, they answered the manipulation check questions, read the cover story for the emotional videos, watched the video and then answered the emotional contagion questions. The participants then informed the researcher or her assistants that they had finished the first part of the experiment and then were given the brief survey. Once the participants have finished the survey, the researcher returned to either interview and debrief or debrief without interview (refer to interview section above for more details). The researcher also gave them a copy of a debriefing form and thanked them for their time. The entire procedure took approximately fifteen minutes.

CHAPTER 3

RESULTS

All statistical analyses were done with SAS/STAT (Cary, NC, 2004). All results

were considered significant at an alpha level of 0.05 (two-tailed).

*Manipulation Check*

*ANOVA.* Ratings of likeability for the target differed significantly for the different

levels of likeability, $F(2, 141) = 145.36$, $p < .01$, $r^2 = 0.67$, with the means of the

likeability ratings falling in the predicted direction. Those in the likable condition rated

the likeability of the target the highest (M = 11.3) while those in the dislikable condition

rated the likeability of the target the lowest (M = 3.3), and those in the neutral condition

rated the likeability of the target in the middle of the other two conditions (M = 7.5). All

pair-wise comparisons between these means were significant (all *ps* < .01).

*Dependent Variable Check*

*ANOVA.* A 1-way ANOVA revealed that the type of emotional story had a

significant effect on self-reported happiness, $F(1, 138) = 11.12$, $p = 0.001$, with those in

the happy condition reporting a higher level of happiness (M = 14.5) than those in the sad

condition (M = 11.7). This difference provided some validity in using self-reported

happiness as the measure for emotional contagion because self-reported happiness was

significantly lower for those who saw the sad story than for those who saw the happy

story.

*Hypothesis Testing*

*Hypotheses one.* The first hypothesis predicted that there would be a linear

increasing trend for mimicry and contagion over increasing levels of likeability.

Specifically, levels of mimicry and contagion should be lowest for those in the dislike

condition and highest for those in the like condition with the neutral condition falling

somewhere in the middle.

*Trend analysis for mimicry during sad story.* Equal spacing between likeability

condition was confirmed using ratings of likeability within the sad story condition

($M_{Dislikeable}$ = 3.36, $M_{Neutral}$ = 7.43, $M_{Likeable}$ = 11.43). The trend analysis indicated that

hypothesis 1 was partially confirmed: a significant quadratic trend for amount of mimicry

was found for the three levels of increasing likeability ($F(1, 63) = 6.79, p = 0.01$).

Specifically, total mimicry was lowest for the dislike condition (M = 0.09) and highest

for the neutral condition (M = 0.43) with those in the likeable condition falling in the

middle (M = 0.14; see Figure 1, Appendix A). To see if those in the dislike condition

mimicked significantly less than the other two conditions, a 1-way ANOVA was run with

Tukey-Kramer pair-wise comparisons of the means. As expected, the results indicated an

overall significant effect for likeability condition, $F(2, 63) = 3.48, p = 0.04, r^2 = 0.1$, with

the subsequent tests revealing a significant difference in overall mimicry between the

dislikable and neutral condition ($M_{Neutral-Dislikable}$ = 0.34, *95% CL* = 0.006 – 0.68, $p$ =

0.003) . Although the total mimicry mean for the likeable condition was higher than the

total mimicry mean for the dislikable condition, this difference was not significant. Total

mimicry was also not significantly different for the neutral and likeable conditions. The

hypothesis was partially confirmed in that those in the dislike condition mimicked the

least. However the other effects contradicted the hypothesis: (1) mimicry was greatest for

those in the neutral condition, and (2) mimicry was not significantly greater for those in

the likeable condition compared to those in the dislikeable condition.

*Trend analysis for mimicry during happy story.* After equal spacing between intervals for the three likeability conditions was confirmed using the ratings for overall likeability for participants in the happy story condition ($M_{Dislikeable}$ = 3.27, $M_{Neutral}$ = 7.59, $M_{Likeable}$ = 11.27), neither the linear or quadratic components of a trend for total mimicry over increasing levels of likeability were significant (linear: $F(1, 75)$ = 1.73, *ns*; quadratic: $F(1, 75)$ = 0.03, *ns*). Also, likeability level did not significantly affect total mimicry ($F(2, 75)$ = 0.89, *ns*); although the means for total mimicry fell in the predicted direction with mimicry increasing over increasing levels of likeability ($M_{Dislike}$ = 0.47 < $M_{Neutral}$ = 0.68 < $M_{Nice}$ = 0.81; see Figure 1, Appendix A). These results disconfirm hypothesis 1 because they suggest that participants mimicked relatively equally regardless of likeability level during the happy story.

*Trend analysis for emotional contagion during sad story.* A marginally significant linear component ($F(1, 63)$ = 3.44, $p$ = 0.068) and a significant quadratic component ($F(1, 63)$ = 8.28, $p$ = 0.006), were found for contagion after seeing the sad story over increasing levels of likeability, suggesting that there is a slight curvilinear trend (see Figure 2, Appendix A). Again, hypothesis 1 was partially confirmed: those in the likeable condition experienced the most contagion (their self-reported happiness after watching the sad story was lower (M = 9.29) than self-reported happiness for both the dislikeable (M = 11.9) and neutral conditions (M = 14.0). However, contrary to the prediction, those in the neutral condition experienced the least amount of contagion (they reported the most happiness after the sad story) while those in the dislikeable condition fell in the middle.

To see whether contagion was significantly lower for the likable condition than the other conditions, Tukey-Kramer pair-wise comparisons were done. The overall 1-way ANOVA was significant, $F(2, 63) = 5.79, p = 0.005, r^2 = 0.16$, and results indicated that the level of happiness in response to the sad story was significantly lower ($M_{Neutral-Likeable} = 4.75, 95\% CL = 1.40 - 8.12, p = 0.003$) for the likeable condition than the neutral condition, indicating that those who saw the likable target tell a sad story were significantly less happy than those who saw a neutral target tell a sad story. However, contrary to the hypothesis, the level of contagion for the sad story was not significantly greater for those in the like condition versus those in the dislike condition, even though the means were in the predicted direction (lower self-reported happiness after sad story = more contagion).

*Trend analyses for emotional contagion during happy story.* The resulting trend of emotional contagion over increasing levels of likeability during the happy story was similar to the trend found for mimicry during the happy story: neither the linear nor quadratic components of the trend analysis were significant (linear: $F(1, 75) = 0.94$, *ns*; quadratic: $F(1, 75) = 1.24$, *ns*). Likeability for the target did not significantly affect self-reported happiness for those participants who saw the happy story ($F(2, 75) = 1.13$, *ns*). However, the mean for self-reported happiness after seeing the happy story was lowest for those in the dislike condition (see Figure 2, Appendix A); even though this difference was not significant.

*Hypothesis two.* Hypothesis 2 predicts that if an association exists for facial mimicry and emotional contagion, the association will be significantly greater for women than men because women have been found to be more facially expressive than men.

*Correlations and Z score testing.* The correlation between facial mimicry and

self-reported happiness for men who saw the sad video was not significant ($r(17) = 0.36$,

*ns*) nor was the correlation for women ($r(45) = 0.02$, *ns*). Although the correlation for

men appears higher than the correlation for women, the difference between them was also

not significant ($z = 1.23$, *ns*). These results indicate that for sadness there may not be a

relationship between mimicry and contagion for either men or women. The same

analyses were run separately for those who saw the happy story. Results were similar in

that men had a stronger correlation ($r(26) = 0.25$, *ns*) for mimicry and contagion than

women ($r(48) = -.06$, *ns*) although neither of these correlations were significant nor was

the difference between the two was significant, ($Z = 1.28$, *ns*; see Figure 3, Appendix A).

Furthermore, women did not significantly mimic facial expressions more than men ($F(1$,

$142) = 0.10, p = 0.75$, suggesting either that woman are not more facially expressive than

men or that facial expressiveness has nothing to do with mimicry.

*Hypothesis three.* Likeability ratings for the target may change after seeing the

target tell a sad or happy story.

*T-tests.* Participants' likeability of target increased significantly ($M_{LT2-LT1} = 1.26$,

*95% CL* $= 0.63 - 1.88$) after seeing the target tell a happy story ($t(78) = 4.01, p = 0.0001$),

whereas likeability for the target did not significantly change after seeing the target tell a

sad story ($t(66) = -0.34$, *ns*). So, overall participants rated the target as more likable after

seeing the target tell a happy story (LT2) than they had rated the target after reading the

comments (LT1). Watching the participant tell a sad story did not significantly change

the likeability of the target (see Figure 4, Appendix A).

To better understand this change in likability ANOVAS were run testing the effect of condition on the change in likability (LT2-LT1) for the sad and happy conditions. For the sad story, the overall model testing differences in liking difference scores was significant, $F(2, 63) = 5.44$, $p < .01$, with subsequent tests showing that the change in likeability after the sad story was greater for the likable condition ($M_{LT2-LT1} = -1.86$) than the dislikable condition ($M_{LT2-LT1} = 1.59$). Specifically, people in the likeable condition liked the target less after watching the target tell a sad story while people in the dislikeable condition liked the target more after the sad story (see Figure 5, Appendix A).

Results for the happy story showed a similar trend (overall ANOVA: $F(2, 75) = 8.49$, $p < .01$): those in the dislikeable condition ($M_{LT2-LT1} = 2.57$) increased their likability for the target after the happy story significantly more than did those in the likeable condition ($M_{LT2-LT1} = -0.23$). These findings indicate that those in the dislikeable target condition increased their likeability of the target after both emotional stories while those in the likeable target condition exhibited a slight tendency to decrease their likeability of the target after both emotional stories (see Figure 6, Appendix A).

CHAPTER 4

DISCUSSION

Mimicry has been suggested to occur automatically due to a neurological link

between perception and behavior (Chartrand & Bargh, 1999; James, 1890). However,

findings of goal-directed mimicry seem to contradict the hypothesis that people simply

mimic what they see (for reviews see Chartrand et al., 2005; Hatfield et al., 1992). For

example, there seems to be a consistent positive association between mimicry and liking

(Chartrand & Bargh, 1999; Chartrand et al., 2005; for a review see Hatfield et al., 1992).

Although research supporting this link has been largely correlational, the fact that

increased mimicry has been associated with increased liking suggests that goals as well

as perception affect mimicry. Why would this be so? Well, from an evolutionary

standpoint, mimicry has been proposed to serve the function of aiding in social survival

because it signals similarity between people (Chartrand et al., 2005; Lakin & Chartrand,

2003; Lakin, Jefferis, Cheng, Chartrand, 2003). Indeed there is evidence that having a

goal to affiliate will increase subsequent behavioral mimicry (Lakin & Chartrand, 2003).

If mimicry does serve the adaptive function of communicating a desire to affiliate, and

mimicry is related to liking, then having a desire to not affiliate with someone whom we

dislike should inhibit both behavioral and emotional mimicry of that person.

So far, the causal direction of liking leading to mimicry has not been tested. Also,

experiments examining the effect of affiliation goal on mimicry mentioned above only

examined either having a goal to affiliate or having no goal at all (Chartrand & Bargh,

1999). The present study attempted to answer these neglected questions by asking (1) do

different levels of likeability cause changes in mimicry and (2) is there a trend to this

change in mimicry such that lower levels of likeability cause lower levels of mimicry. This paper tested the hypothesis that people don't mimic whatever they perceive; if they've assessed that someone is an undesirable social partner, their goals of dislike and non-affiliation will modify their automatic tendency to mimic the undesirable other.

The hypothesis that mimicry and emotional contagion would increase over increasing levels of likeability was only partially confirmed and depended largely on type of emotional story. For the participants who watched the sad video, in agreement with the hypothesis, mimicry was lowest for those who disliked the target, and emotional contagion was highest for those who liked the target. Although participants in the dislikeable group mimicked the least during the sad story and participants in the likeable group experienced the most contagion during the sad story, these two conditions did not significantly differ from each other in amount of mimicry or contagion. The result that those who felt neutral about the target exhibited the most mimicry but the least amount of contagion (both during the sad story) also contradicted the prediction. Specifically, the happiness levels of those in the neutral condition were affected the least by the sad emotional story. There was also no effect of likeability on mimicry and contagion for the happy story.

One explanation for these unexpected findings is that inducing a goal in the participants to affiliate or not to affiliate with the target may have created an unexpected new goal that became activated during the emotional videos. Specifically, the manipulation required that the participant choose whether or not they wanted to work with the potential lab partner. For those who liked the person and chose to definitely work with the person, they may have felt the need to ensure that they had decided

correctly. So during the emotional video, a new goal of "ensure you made the right decision by scrutinizing this person" may have been activated, inducing a more critical view of the potential lab partner. A somewhat opposite goal may have occurred for those who received the undesirable lab partner because of their decision not to work with the potential lab partner. The decision to not affiliate may preclude the need to critically view the person further. In fact, watching the supposedly dislikeable potential lab partner feel happy or sad seemed to make an undesirable target more desirable. It is possible that for both the likeable and dislikeable conditions, the goal to analyze the person may have superseded the goal to affiliate with the person, but with different behavioral and emotional consequences for each group. Those in the dislikeable group increased their likeability due to the fact that they did not have to affiliate with the target; while those in the likeable group decreased their liking because their decision to affiliate may have made them more critical.

A lack of any goal would explain why participants in the neutral condition mimicked the target the most and felt the least contagion for the target. Not having a goal would allow those in the neutral condition to mimic simply based on reflexes caused by perception. Also, feeling neutral about another could make them less susceptible to contagion as well. These explanations for the unexpected results are simply conjecture and would need to be empirically tested.

The increase in likeability for the undesirable target after the sad and happy emotional stories made it difficult to test the hypothesis, which required that there was sufficient variation in likeability. The point of this study was to focus on the effect of different degrees of likeability on mimicry and contagion; the point was not to test

whether watching someone tell an emotional story affects likeability of that person. In the future, it will be necessary to find a manipulation that sustains through the emotional stories. A situation is needed where one has an intense dislike and desire to not affiliate. For example, if someone saw Hitler tell a happy story that person's likeability of Hitler would probably not change enough to get to a neutral point.

Another question explored in this study was whether or not an association exists between mimicry and contagion. The result that those in the neutral condition mimicked the target the most but experienced the least amount of contagion of the target suggests that mimicry and contagion may not be associated. These results contradict research on facial feedback which predicts that mimicry of specific emotional expressions can lead to contagion of those emotions (Adelmann & Zajonc, 1989; Bush, Barr McHugo & Lanzetta 1989). Other studies, like the present study, also have failed to find this relationship (Gump & Kulik, 1997; Blairy, Herrera, & Hess, 1999; Hess & Blairy, 2001).

Furthermore, other studies contradict this proposed link of mimicry to contagion through facial feedback by showing that women are more facially expressive than men (for an extensive review, see Kring & Gordon, 1998) yet not more susceptible to contagion than men (Hsee et al., 1990; Wild et al., 2001; Dimberg & Lundqvist, 1990; Lundqvist & Dimberg, 1995). It was thought that if feedback does lead to mimicry than the correlation between mimicry and contagion should be greater for women than for men. The results of this study contradict this hypothesis in two ways: (1) women were not found to mimic facial expressions more than men and (2) none of the correlations between mimicry and contagion were significant for men and women nor were the differences between men's and women's correlations significant. In fact, the correlations

between mimicry and contagion were higher for men than women for both the sad and happy story. These results suggest that some other mechanism than mimicry is responsible for emotional contagion than and that this mechanism may be used by both men and women.

It is important to note that although there were several limitations to this study (e.g. failure to maintain dislike for target, activation of other goals), the study still adds significantly to the literature in two ways: (1) this study established a causal link between liking and mimicry and emotional contagion with disliking leading to less mimicry and liking leading to more contagion and (2) this study adds evidence that mimicry may not be a causal factor of emotional contagion for men or women. Also, one could consider the results of the sad story as a stringent test of the hypothesis in that even though likeability increased slightly for the dislikeable group and decreased slightly for likeable group, the dislikeable group still mimicked less than the neutral group and the likeable group still experienced more contagion than the neutral group. It appears that a goal to not affiliate can mediate our automatic reflexes such as mimicry and emotional contagion.
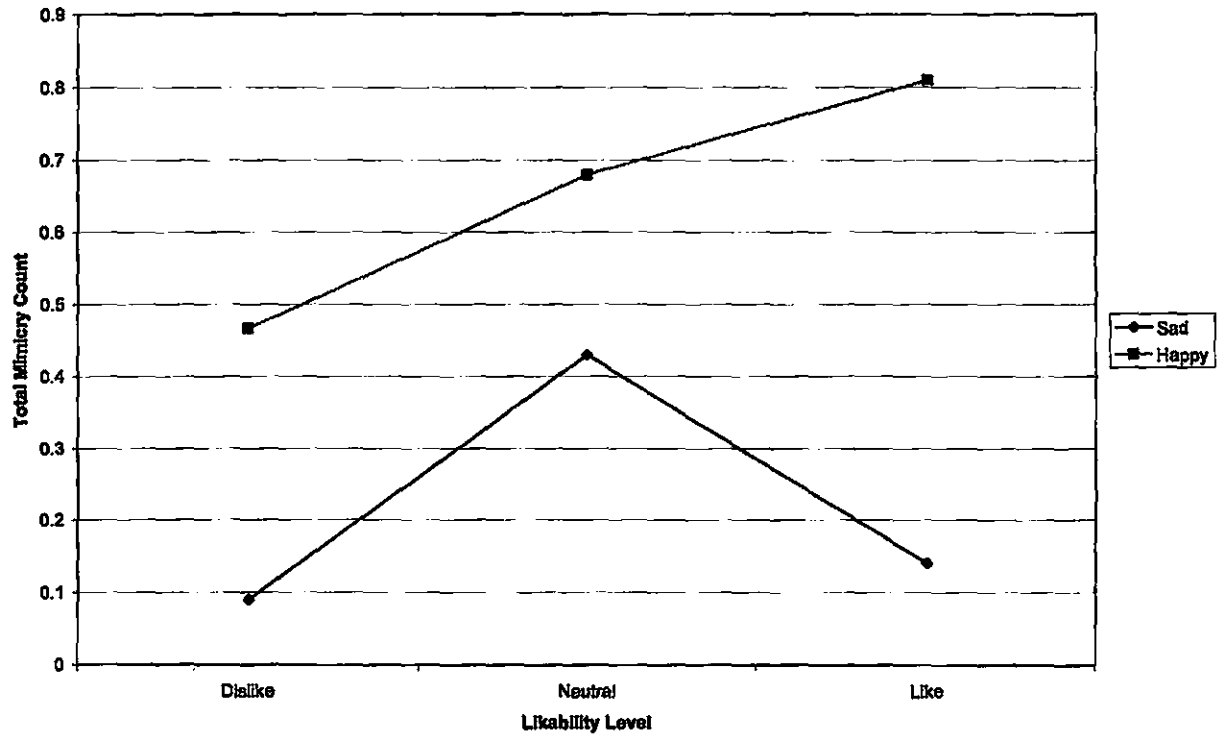
APPENDIX A

FIGURES



Figure 1. *Trend for mimicry over increasing likeability levels for sad and happy emotional stories.*
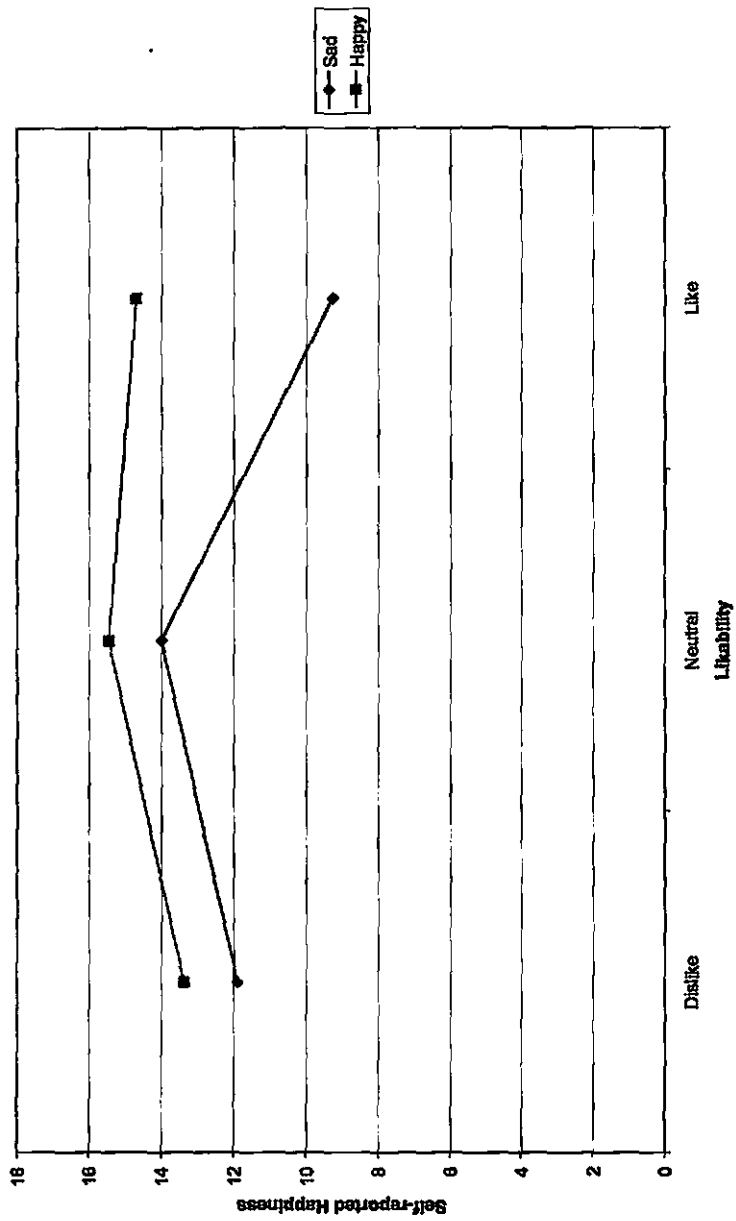
Figure 2. *Trend for amount of happiness over increasing likeability levels for sad and*
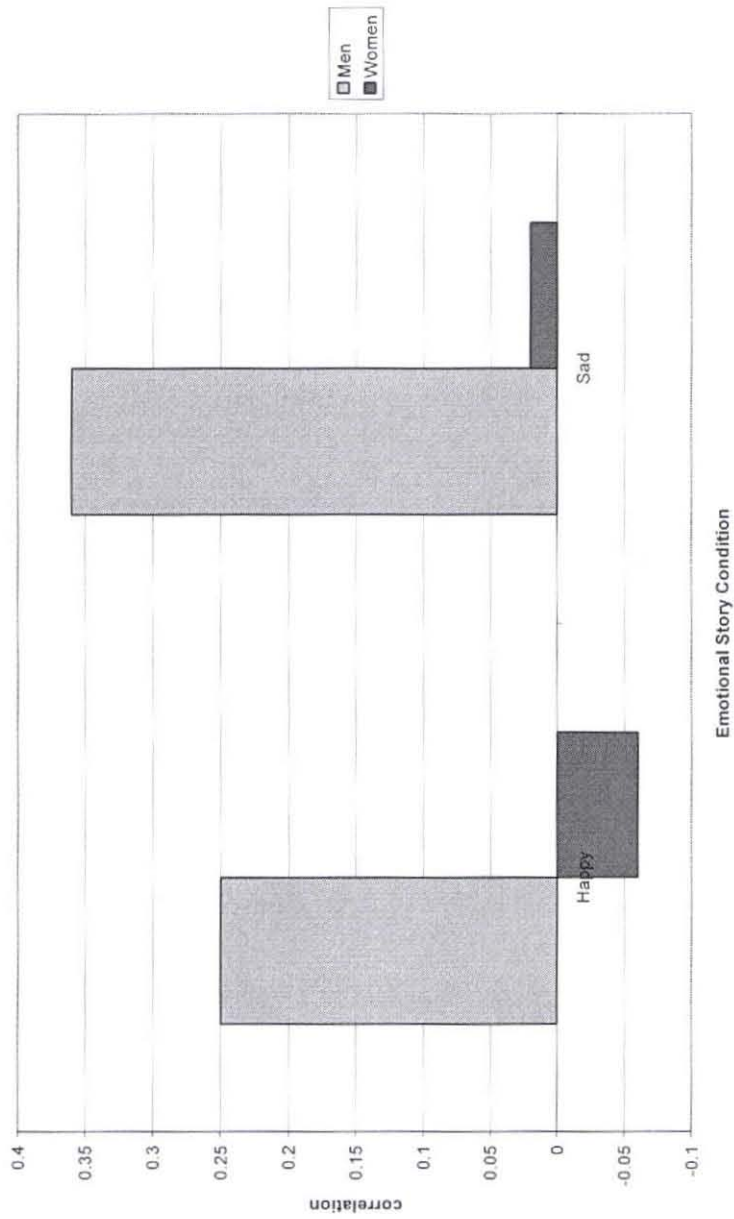
*happy emotional stories.*

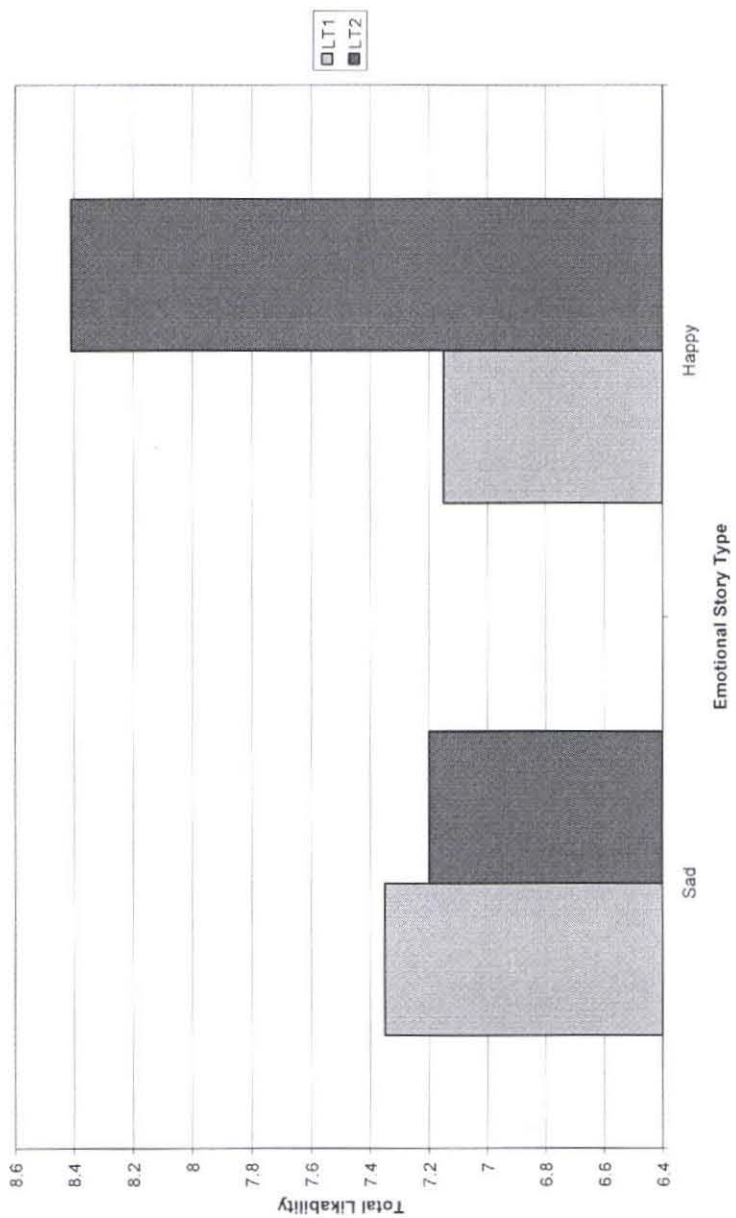Figure 3. *Mimicry and emotional contagion correlations for men and women.*

Figure 4. *Change in likeability for target after watching the emotional stories.*
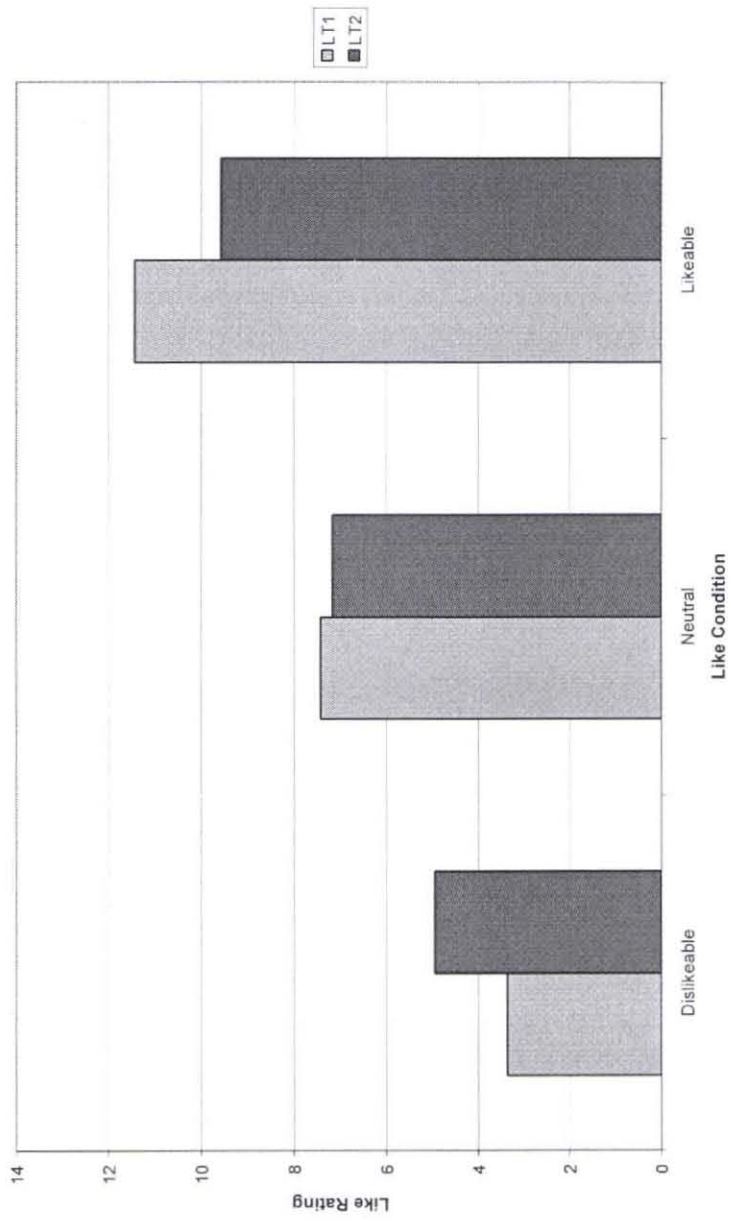
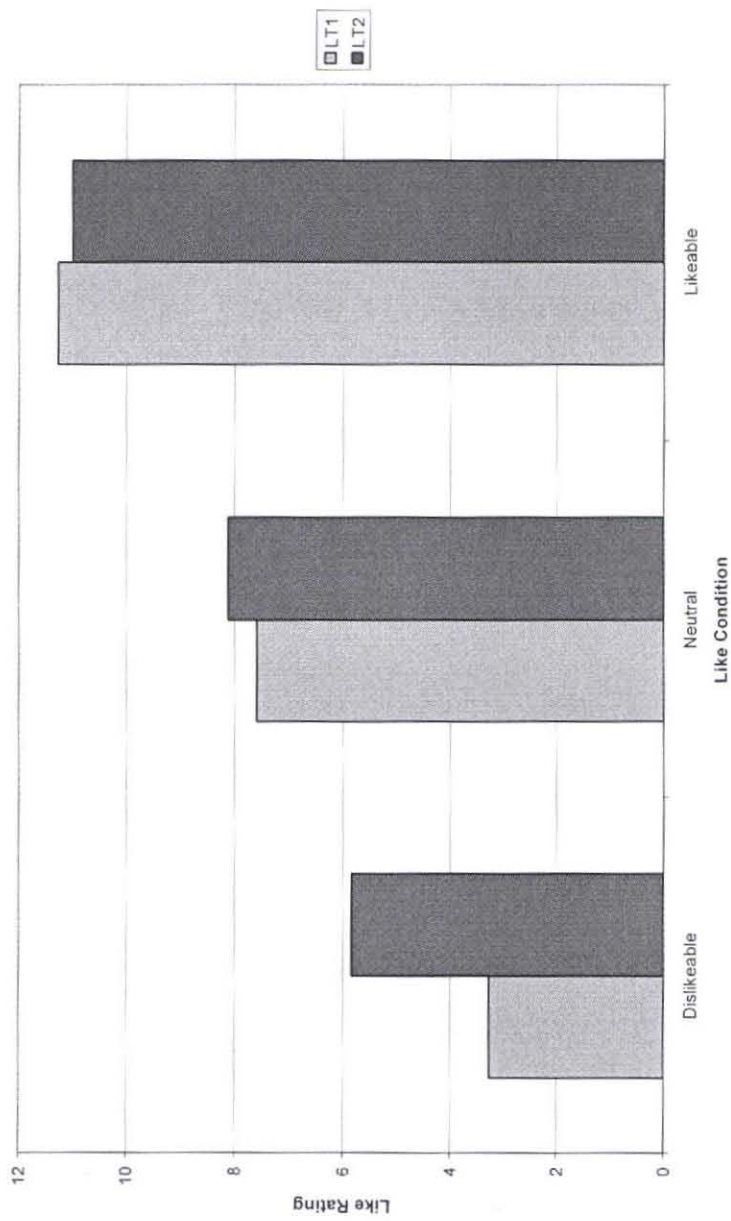Figure 5. *Change in likeability for target after sad story.*

Figure 6. *Change in likeability after happy story.*

# APPENDIX B

## MANIPULATION

*Directions to Students*

As part of this experiment, you may be asked to work with another person on a task. We would like to offer you the opportunity to choose who you work with. To help you choose a partner, we will show you some comments made by a few people who have already worked with this person. You will also see a video of this person. Please read all of the statements and then answer the questions that follow. When you are ready to view these statements, press the space bar.

*Bad Lab Partner*

"She wanted me to do all the work while she watched"

"She gave me the creeps"

"She kept making racist comments, and she wasn't joking"

"After we finished, she took all the credit for the work I did"

"I think she gets a kick out of making others feel bad"

*Good Lab Partner*

"She did more than her fair share of the work"

"I had fun with her"

"She was totally cracking jokes…hilarious!"

"After we finished, she complimented the work I did"

"I think she likes making people feel good about themselves"

*Neutral Lab Partner*

"She was kind of whatever"

"I didn't really get to know her"

"I'm really bad with names. I'm not exactly sure who that girl is."

"She was ok to work with"

"After we finished, we both got credit for the work"

APPENDIX C

EMOTIONAL RATINGS


*Directions to Students*

Please enter the number on the keyboard that best represents how YOU feel right now.

*Happy Terms*

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| Not at | | slightly | | moderately | | considerably | | very |
| all happy | | happy | | happy | | happy | | happy |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| Not at | | slightly | | moderately | | considerably | | very |
| all cheerful | | cheerful | | cheerful | | cheerful | | cheerful |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| Not at | | slightly | | moderately | | considerably | | very |
| all pleasant | | pleasant | | pleasant | | pleasant | | pleasant |

*Sad Terms*

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| Not at | | slightly | | moderately | | considerably | | very |
| all sad | | sad | | sad | | sad | | sad |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|

Not at          slightly          moderately          considerably          very

all depressed          depressed          depressed          depressed          depressed

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|

Not at          slightly          moderately          considerably          very

all unpleasant          unpleasant          unpleasant          unpleasant          unpleasant

*Filler Terms*

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|

Not at          slightly          moderately          considerably          very

all tired          tired          tired          tired          tired

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|

Not at          slightly          moderately          considerably          very

all relaxed          relaxed          relaxed          relaxed          relaxed

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|

Not at          slightly          moderately          considerably          very

all active          active          active          active          active

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| Not at | | slightly | | moderately | | considerably | | very |
| all stressed | | stressed | | stressed | | stressed | | stressed |

APPENDIX D

SURVEY

**Please read and answer the following questions:**

What is your gender?     Male     Female                    What is your age? _____

Which of the following ethnic group(s) do you consider yourself a member of?
_____ African-American
_____ Asian-American
_____ Chinese
_____ Hawaiian
_____ Hispanic
_____ Japanese
_____ Korean
_____ Native-American
_____ Caucasian
_____ Pacific Islander
_____Other:_____

# Instructions: Circle how strongly you agree with each statement. Please think about the person you read about and saw on the video.

**This person is friendly.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |
|---|---|---|---|---|---|---|

**This person is likable.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |
|---|---|---|---|---|---|---|

**This person is warm.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |
|---|---|---|---|---|---|---|

**This person is approachable.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |
|---|---|---|---|---|---|---|

**I would ask this person for advice.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |
|---|---|---|---|---|---|---|

**I would like this person as a coworker.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |

**I would like this person as a roommate.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |

**I would like to be friends with this person.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |

**This person is physically attractive.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |

**This person is similar to me.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |

**This person is knowledgeable.**

| Very Strongly Disagree | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Very Strongly Agree |

# APPENDIX E

## POST-EXPERIMENT INTERVIEW

*Interview Sheet*

1. What do you think this experiment is about?

Write answer ONLY if they say anything about the following.

- the experiment tried to get me to like, dislike, feel neutral about someone

- the experiment was looking at mimicry

- the experiment was looking at emotional contagion

2. Did you know the person in the video? Yes/No/Maybe

3. If yes, how well? Seen around/Acquaintance/Very Well

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