Exploring the Reciprocity of Attraction Effect: Is the Truism True?

A dissertation presented to
the faculty of
the College of Arts and Sciences of Ohio University

In partial fulfillment
of the requirements for the degree
Doctor of Philosophy

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May 2015

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This dissertation titled
Exploring the Reciprocity of Attraction Effect: Is the Truism True?

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GORDON, ELLEN R., Ph.D., May 2015, Experimental Psychology

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The current research investigates the reciprocity of attraction phenomenon. The first six studies offer evidence for reciprocal liking and disliking. The first study demonstrated the effect while using a confederate. The second and third study demonstrated that people reciprocate attraction with both a previously liked and less liked individual. The fourth and fifth study employed an unobtrusive measure of attraction and the sixth demonstrates the effect by observing a real-world natural event, the sorority recruitment process. A seventh study was proposed that included an control condition as well as an unobtrusive measure of attraction.
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CHAPTER 1: INTRODUCTION

It is believed that people are sensitive to interpersonal cues of acceptance and rejection in order to monitor their level of social belongingness (Leary, 1999). Evolutionary psychologists argue that human’s propensity to live in groups served an adaptive function (Baumeister & Leary, 1995): humans that were well accepted and lived in cohesive groups had a greater chance of surviving than humans that did not form groups. Thus, it is important and beneficial for individuals to form relationships with other individuals who appear to be willing to enter into such a relationship. A major theory of interpersonal attraction, the reciprocity of attraction, makes such a prediction. This theory predicts that we are attracted to those who appear to like us while we dislike those who we believe dislike us (Ossorio & Davis, 1966).

This phenomenon is often treated as a psychological truism and is considered to be a major determinant of both romantic and non-romantic attraction. Despite the widespread influence this effect is predicted to have, the amount of research that is devoted to this theory is quite small. Few studies are offered to support this theory and there do not appear to be any studies that have established boundary conditions or moderating variables.

In addition, a closer look at the classic experimental studies that are offered as evidence of reciprocal attraction reveals some methodological limitations. For example, Backman and Secord (1959) is often cited as one of the original experimental demonstrations of the reciprocity of liking effect. In this study, experimental sessions included several participants. Prior to meeting the other individuals, participants were told that, on the basis of their personality, it was likely that certain individuals would
“probably like the participant”. After all participants were allowed time to become acquainted, they were asked to choose which individuals they wished to spend further one-on-one time with. As predicted, participants picked the individuals who they were previously told would, most likely, like them.

There are several limitations with this study; most importantly, the feedback participants received did not necessarily represent interpersonal attraction. Essentially participants were informed that the experimenter believed that certain individuals would like the participants based on everyone’s responses to a personality questionnaire. However, this is not necessarily the same as finding out that another person actually likes you. In addition, the researchers did not capture the change in attraction from before to after the feedback was administered. In order for a study to offer direct support of the reciprocity of attraction rule, it would be beneficial to demonstrate a change in attitudes after participants find out that another person likes them or dislikes them. Additionally, Backman and Secord (1959) did not manipulate the “negative side” of reciprocal attraction. That is, do we begin to dislike someone after we find out they dislike us?

Many of these methodological limitations are found in other studies that are often considered scientific demonstrations of the reciprocity of attraction phenomenon. Moreover, in comparison to the majority of psychological theories that are rather nuanced and narrow in scope, the theory of reciprocal attraction is relatively grand. Research has yet to determine if there are any boundary conditions to reciprocal liking or if the effect is as broad as it has previously been assumed to be. The purpose of this paper is to review the existing literature regarding the reciprocity of attraction effect; specifically, observational research and experimental research concerning reactions to various types of
feedback, social acceptance, and social rejection offer evidence of reciprocity of liking. In addition, this paper details new, improved experimental research that is intended to further this body of research. Furthermore, a new research study is proposed. It is important to mention that, while reciprocal attraction is believed to predict both romantic and nonromantic attraction, the present research’s focus is on nonromantic, same-sex attraction.
CHAPTER TWO: OBSERVATIONAL RESEARCH

Research has demonstrated that people appear to be aware of the influence of reciprocal liking on attraction. In fact, the majority of people indicate reciprocal liking as a reason for a new relationship (Aron, Dutton, Aron, & Iverson, 1989; Sprecher, 1998). Observational studies have revealed that the layperson’s beliefs are not unfounded. Research has documented the reciprocity of attraction effect in a variety of situations utilizing a diverse set of samples.

More traditional research has been observed the phenomenon in a laboratory setting among undergraduate students (Chapdelain, Kenny, & LaFontana, 1994; Insko & Wilson, 1977). For example, Chapdelain, Kenny, and LaFontana (1994) introduced previously unacquainted female participants and reported positive correlations between participants’ reported attraction toward one another. That is, participants tended to express similar levels of attraction toward one another.

Field studies have also observed the phenomenon (Clark & Ayers, 1988; Clark & Drewery, 1985; Curry & Emerson, 1970; Kenny & Nasby, 1980; Kenny & La Voie, 1982; Martindale, Ross, Hines, Abram, 1978; Newcomb, 1961). The most common method has been to observe undergraduates, who are living in the same dormitory, over a period of time (Curry & Emerson, 1970; Kenny & Nasby, 1980; Kenny & La Voie, 1982; Newcomb, 1961). These studies have found that individuals tend to display similar levels of attraction to each another and that their attraction for one another increases over time.

Additional field studies have observed reciprocal attraction in children (Ausubel & Schiff, 1955; Clark & Ayers, 1988; Clark & Drewery, 1985). In two of these studies,
elementary (Clark & Ayers, 1988) and junior high school students (Clark & Drewery, 1985) were asked to list their three best friends. The children were then classified as having *reciprocated friendships* if one of their three friends also listed them as a best friend, or as having *unreciprocated friendships* if none of their three friendships were mutual. This research revealed that although many friendships were reciprocated; interestingly, there were a number of children who were not classified as having a mutual best friend (i.e., their liking was not reciprocated). Analyses indicated that children in reciprocated friendships were more likely be considered high-status students (e.g., more popular, nicer clothes, and more attractive) than children who did not have a mutual best friend.

**Romantic Attraction**

The above described research observed same-sex nonromantic attraction or friendship. However, there have been observational studies that have focused on romantic attraction by observing individual’s reactions and attitudes during a speed-dating event (Eastwick, Finkel, Mochon, & Ariely, 2007; Luo & Zhang, 2009). These studies have also found evidence for reciprocal attraction.

For example, Luo and Zhang (2009) found support for reciprocal attraction after participants received feedback regarding the other participants’ attitudes. During this speed dating event, participants met the other participants and then indicated who they were interested in spending more time with. Later, participants were informed of the individuals who had expressed a mutual interest in meeting at a later date. After participants received this feedback, they demonstrated the reciprocity of attraction.
phenomenon: individuals tended to match, or agree with, one another on their level of expressed romantic interest.

As many are quick to point out, romantic attraction is not always reciprocated. Indeed, Baumeister, Wotman, and Stillman (1993) found that the vast majority of participants could recall autobiographical instances of unrequited love when prompted. However, this research focused on the emotional reactions of the both the rejectors and the would-be lovers (i.e., the individuals who were rejected) rather than observing the reasons why individuals did not reciprocate another person’s romantic interests.

**Summary**

In summary, observational research has supported the theory of reciprocity of attraction. It appears that, in the real world, individuals tend to like those who like them back and dislike those who dislike them back. However, the majority of the observational studies only demonstrated that individuals express similar levels of attraction toward one another. The theory of reciprocity attraction would predict that people will like another individuals more after finding out that individual likes them; in addition, it is predicted that people will begin to dislike another after finding out that individual dislikes them. Observation research has not tested this hypothesis.

Experimental research can manipulate attraction by administering feedback to participants that another individual either likes them or does not like them. If participants demonstrate a change in attraction following the feedback, then this finding would directly support of the theory of reciprocity. Furthermore, social psychology considers experimental research as the gold standard. Thus, any theory needs laboratory studies with experimental manipulations to supplement supporting observational research.
CHAPTER THREE: EXPERIMENTAL RESEARCH

Most of the experimental support for the reciprocity of attraction comes from laboratory research on reactions to evaluations from others (for a review see Mettee & Aronson, 1974). A good deal of this research was conducted to contribute to the consistency-enhancement debate, which was examining whether people prefer self-congruent feedback or self-enhancing feedback (for a review see Jones, 1973; Shrauger, 1975). Many of these studies also observed reactions to evaluators, or the source of the feedback. As the reciprocity of attraction phenomenon would predict, these studies typically found that people dislike those who give negative feedback and like those who provide positive feedback.

However, as the following sections will explain, many of these studies are limited in the amount of support they can offer for the reciprocity of attraction phenomenon. For example, the feedback often utilized in these studies regarded attitudes or abilities and did not directly indicate the level of attraction another person felt toward the participant. Thus, there may be problems with generalizing the results of these studies to the domain of interpersonal attraction. Furthermore, in the majority of the studies, the participant did not interact with the source of the feedback prior to receiving the feedback. Consequently, the researchers were unable to observe the actual change in attitudes or determine if prior attitudes play a moderating role.

**Attitude / Opinion Feedback**

Jones, Byrne, and colleagues conducted a series of studies that documented the reciprocity of agreement effect (e.g., Jones & Shrauger, 1968; Jones & Schneider, 1968). In these studies, participants would read opinion statements out loud (e.g., I like dogs)
and indicate if they agreed or disagreed with the statement. They would then find out if another participant, a confederate, agreed or disagreed with the participants’ opinion. Afterwards, the confederate and participants switched roles: the confederate then read out loud other opinion statements and indicated their agreement level. The results revealed that participants agreed with the confederate’s opinions if the confederate previously agreed with their opinions. Likewise, participants mostly disagreed with the confederate who had previously disagreed with their opinions (Jones & Shrauger, 1968; Jones & Schneider, 1968).

Additional studies found that participants rated the confederate who agreed with their opinion more favorably than the disagreeable confederate (Byrne, Rashe, Kelley, 1974; Dutton & Arrowhead, 1971; Pepitone & Wilpizeski, 1960; Shrauger & Jones, 1968). Byrne (1971) theorized that participants assumed that the agreeing or disagreeing confederate was similar or dissimilar to them and it was perception of similarity that was driving the participants to view the confederate less favorably. Indeed, perceived similarity is theorized to be an important determinant of attraction (e.g., Buss, 1984; Burgess & Wallin, 1953; Newcomb, 1961; Galupo, 2007).

Nevertheless, Aronson and Worshel (1966) found that participant inferred that the agreeing confederate liked them more. Subsequently, Condon and Crano (1988) found that the relationship between attitude similarity and attraction was completely mediated by inferred evaluation. That is, participants liked the confederate who agreed with their attitudes because they assumed that the confederate liked them. Thus, this research appears to be in support of the reciprocity of attraction theory.
However, these research studies all utilized a between-subjects design. A within-subjects design would observe the actual change in attraction in response to the interpersonal feedback. As mentioned previously, observing a change in attitudes can offer direct support for the theory of reciprocity. In addition, it is important to investigate whether participants’ existing attitudes toward a person moderates the phenomenon of reciprocal attraction. As explained earlier, individuals might not experience an increase or decrease in attraction toward another person if they feel that the interpersonal feedback matches or is similar to the amount of attraction they currently feel.

Furthermore, it may be that some types of individuals may not experience reciprocal liking or disliking. For example, people’s attraction toward highly desirable individuals may not be influenced by negative feedback. Likewise, people’s level of attraction toward a highly un-desirable individual may not be impacted, even by extremely positive feedback. As explained earlier, a few observational studies indicated that attraction is not always reciprocated (Baumeister, Wotman, & Stillwell, 1993; Clark & Ayers, 1988; Clark & Drewery, 1985). Both Clark and Ayer’s (1988) and Clark and Drewery’s (1985) indicated that the popular children were more likely to experience reciprocal attraction. To date, there has not been empirical research that has determined if initial impressions or prior attitudes influences whether interpersonal attraction is reciprocated or not.

**Intelligence & Performance Feedback**

Other studies have looked at the reactions to negative evaluations regarding ability or intelligence level; in these experiments participants received feedback from a confederate that they performed poorly on a task. In general, these studies have revealed
that participants who received a negative evaluation indicated that their evaluator was less competent or accurate in comparison to participants who received positive feedback (Drachman, DeCarufel, & Insco, 1978; Howard & Berkowitz, 1958; Sinclair & Kunda, 2000; Smalley & Stake, 1996). In addition, participants like the confederate, or evaluator, more after receiving positive feedback than negative feedback (Deutsch & Solomon, 1959; Reed, Mikalauska, Everson, & Wilson, 1987; Skolnick, 1971; Sigall & Aronson, 1969). These studies show that we like someone who rates us favorably on a task or ability and we dislike those who rate us unfavorably on a task or ability.

Sigall and Aronson (1969) found that the physical attractiveness interacted with the effects of the feedback. That is, while participants liked the evaluator who administered positive feedback more than the negative evaluator, participants preferred the attractive, positive evaluator more than the unattractive, positive evaluator. In addition, participants liked the attractive confederate who administered negative feedback more than the unattractive evaluator who issued negative feedback. However, subsequent research failed to replicate this interaction (Reed, Mikalauska, Everson, & Wilson, 1987).

While this line of research demonstrates that feedback influences participants’ perceptions of the evaluator, it does not directly support the theory of reciprocal attraction. Feedback regarding task performance is not the same as feedback regarding interpersonal attraction. Furthermore, the feedback often came from an authority figure (e.g., experimenter, interviewer, graduate student, etc; Deutsch & Solomon, 1959; Skolnick, 1971). People may respond differently to feedback regarding performance on a specific task that is administered by an authority figure. Thus, it is important to
demonstrate reciprocal attraction in response to feedback that is a valid operational definition of interpersonal attraction.

**Personality Feedback**

There have been experimental studies in which the participants receive negative or positive evaluations regarding their personality (Harvey & Clap, 1965; Lowe & Goldstein, 1970; Regan, 1976; Shrauger & Lund, 1974; Steiner, 1967). In these studies, participants learned that a confederate rated the participant either positively or negatively on various personality adjectives. These studies can offer better support for reciprocity of liking. It makes sense to conclude that someone likes or does not like us if they give us positive or negative feedback regarding our personality.

Similar to the research involving intelligence feedback, participants who received a positive evaluation on their personality rate the evaluator as more competent than participants who received a negative evaluation (Shrauger & Lund, 1974; Steiner, 1697). Additional studies have found that participants who were evaluated positively rated the confederate as more likeable than participants who were evaluated negatively (Aronson & Linder, 1965; Harvey & Clap, 1965; Lowe & Goldstein, 1970; Jones, Gergen, & Davis, 1962; Regan, 1976).

However, in these studies, participants did not get a chance to interact with the confederate (Harvey & Clap, 1965; Lowe & Goldstein, 1970; Regan, 1976). Thus, the only information they received regarding the confederate was the feedback. Moreover, there may have been demand characteristics in the Lowe & Goldstein (1970) study because participants were told to evaluate the confederate “on the basis of the evaluation you just received”.
In Jones, Gergen, and Davis’s (1962) research, participants did have an opportunity to interact with the evaluator. However, the evaluator, a graduate student, simply interviewed the participants (i.e., asked the participant a series of personality and opinion questions). Thus, the interaction between the participant and interviewer was minimal; the only knowledge the participant held of the evaluator was the feedback that was administered. Aronson and Linder (1965) allowed participants a chance to get to know their evaluator before they found out the evaluator’s impressions. Unfortunately, the researchers only measured the participants’ attitudes toward the evaluator after the interpersonal feedback was issued.

Research is needed in which participants are given a chance to actually interact with, and form an impression of, the source of the feedback before the feedback is administered. This procedure would have greater external validity—most likely, in the real world, people have already formed an impression of another before finding out that the other person either likes or dislikes them. As mentioned previously, this paradigm would allow researchers to observe the actual change in attraction and attitudes following the feedback, which would provide actual evidence for the reciprocity of attraction phenomenon. As mentioned previously, this paradigm would also allow researchers to determine if participants’ existing attitudes play a moderating role.

**Attraction Feedback**

There have been experimental studies that have directly manipulated feedback regarding interpersonal attraction. Byrne and colleagues conducted a series of studies in which participants were actually informed that a confederate either liked or disliked the participant. As expected, the research found that people like those who like them and
dislike those who dislike them (Aronson & Worchel, 1966; Byrne & Griffith, 1966; Byrne & Rhamey, 1965; Johnson, 1974). In these studies, participants indicated their attitudes and found out if the confederate agreed or disagreed with the participant’s attitudes; thus, the interaction between the confederate and participant was somewhat limited and low in external validity. Furthermore, as with the research investigating reactions to personality feedback, these studies did not demonstrate the change in attractiveness toward the source after the administration of feedback (i.e., they did not assess attitudes toward the source of the evaluation before the feedback was administered).

In more recent research, Curtis & Miller (1986) found that participants behaved in a friendlier manner after being informed that another person liked them. In this study, participants filled out a battery of questionnaires assessing their personality, interests, and hobbies. Participants were led to believe that the partner that they were about to meet either liked or disliked them based on the participants’ responses to the questionnaires. Thus, the participants did not form an impression of their partner before the feedback was administered. Participants who believed that their partner liked them disclosed more personal information, disagreed less, expressed dissimilarity less, and displayed a more positive tone of voice than participants who were led to believe their partner disliked them. This article showed evidence for friendlier behaviors but they did not assess actual liking or attraction toward the partner. In addition, this study did not measure prior attitudes or initial impressions.
**Romantic Attraction**

There has been more research demonstrating nonromantic reciprocal attraction among same-sex participants. However, there have been a few studies that have observed reactions to interpersonal feedback from the opposite sex. These studies have replicated the results from the studies utilizing a same-sex paradigm: participants are more attracted to a positive evaluator (i.e., an individual who issues positive interpersonal feedback) in comparison to a negative evaluator (Katz & Beach, 2000; Lehr & Geher, 2006, Wilson & Henzlik, 1986). In addition, the methodological limitations of these studies are the same as those investigating nonromantic attraction. For example, a bogus stranger paradigm is employed in which participants do not get to know the evaluator before the feedback is administered (Katz & Beach, 2000; Lehr & Geher, 2006). Wilson and Henzlik (1986) did allow participants to get to know one another before they received feedback; however, the researchers did not assess prior attitudes or initial impressions.

**Summary**

Together, the studies examining reactions to feedback suggest that positive feedback leads people to like the source of the evaluation while negative feedback leads to disliking the source of the evaluation. As stated earlier, there are methodological concerns that prevent many of the studies from offering direct support for the reciprocal liking phenomenon. Often the operational definition that was employed did not represent interpersonal attraction. In addition, the confederate often represented an authority figure (e.g. interviewer or graduate student). As explained earlier, it may be than individuals respond differently to feedback from authority figures in comparison to peers.
More importantly, in the majority of the studies, the participant never interacted face to face with their evaluator. The only knowledge the participants had of the evaluator was the feedback they administered. In fact, some of the studies showed that the participants discounted the feedback on the basis that the evaluator did not know them well enough (Blaine & Crocker, 1993; Bourgeois & Leary, 2001). As stated earlier, it is important to assess previous attitudes; not only will observe the change in attitudes in response to the interpersonal feedback but positive and negative feedback may have a different impact depending on whether it comes from a previously liked or disliked peer.

**Social Rejection & Acceptance**

More recently, research on social exclusion has investigated peoples’ reactions to cues of rejection. Due to the benefits of group membership and interpersonal relationships, it has been theorized that humans are especially sensitive to signs of social exclusion and rejection (Baumeister & Leary, 1994). A popular theory in psychology, the sociometer theory, offers a mechanism that keeps track of cues of social rejection. Leary and colleagues (Leary, Tambor, Terdal, & Downs, 1995) believe that an individuals’ self-esteem, or how one feels about oneself, serves as a mechanism for monitoring the amount of social inclusion and detecting cues of social rejection. Trait, or stable, self-esteem represents the overall amount of social inclusion. Individuals who perceive themselves as well accepted by others have high trait self-esteem; conversely, individuals who feel that they are disliked and rejected by others have fairly low trait self-esteem.

State self-esteem, on the other hand, is how an individual currently feels about oneself and is theorized to fluctuate somewhat throughout the day. Leary et al. (1995)
believes that state self-esteem is the mechanism for responding to cues of social rejection and exclusion. When a person perceives a cue of rejection, he or she experiences a decline in state self-esteem.

The literature on social rejection confirms the sociometer major assumptions: individuals experience a decrease in state self-esteem and experience negative affect in response to social rejection and an increase in state self-esteem and positive affect in response to social acceptance (Buckley, Winkel, & Leary, 2004; Leary et al., 2003; Leary, Haupt, Strausser, & Chokel, 1998). The sociometer theory argues that people will react to cues of social rejection in ways that will increase their level of social inclusion (Leary et al., 1995). Individuals have been shown to respond pro-socially following perceived social exclusion. Research suggests that cues of rejection often lead individuals to act in ways that will increase their social bonds (Baumeister & Leary, 1995). For example, Williams, Cheung, and Choi (2000) found that excluded participants were more likely to conform and agree with confederates’ obvious incorrect answers using Asch’s conformity paradigm.

Conversely, a large body of research has demonstrated that people respond aggressively following an experience of social rejection or exclusion (Leary, Twenge, Quinlivan, 2006). At face value, aggression may not appear as an adaptive method to increase one’s inclusion in the group. However, aggressive acts may serve as a manipulation tactic to deter both the source of the rejection as well as other individuals from rejecting one in the future.

On one hand, the literature on social belongingness might predict an increase in attraction following both positive and negative interpersonal feedback. Increasing
attraction can serve to increase an individual’s level of inclusion if it can persuade the source of the negative feedback to think otherwise (Jones, 1964). However, the abundance of research has demonstrated that individuals respond aggressively to negative social feedback (for a review see Leary, Twenge, Quinlivan, 2006). Since derogating others can be considered a form of aggression, this research suggests that individuals would demonstrate an increase in negative attitudes regarding the source of negative feedback.

**Social exclusion or ostracism.** A good deal of the social rejection literature tends to investigate social exclusion or exclusion from a group or society (e.g., ostracism). The most commonly used manipulations in these studies is convincing the participants that they will have no interpersonal relationships when they are older (e.g., Twenge et al., 2001) or that a group of people did not accept them or ignores them (e.g., Leary et al., 1995; Williams, Cheung, & Choi, 2000). These manipulations are very different than a manipulation involving interpersonal feedback from one individual. Furthermore, the research dealing with group exclusion tends to only observe behavioral reactions (e.g. levels of aggression) in response to exclusion rather than reactions to the source of rejection (Maner, DeWall, Baumeister, & Schaller, 2007; Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007; Twenge, Baumeister, Tice, & Stucke, 2001; Williams, Cheung, & Choi, 2000).

**Individual rejection.** Some studies have investigated rejection from one individual. This research is highly relevant to the reciprocity of attraction phenomenon: being rejected by an individual is, most likely, a clear indicator that the individual dislikes you. However, these studies tend to investigate individuals’ aggressive reactions
(Ayduck, Gyurak, Luerssen, 2008), changes in self-esteem (Leary et al., 2003), and hostile feelings in response to rejection (DeWall, Twenge, Gitter, & Baumeister, 2009; Twenge, Baumeister, Tice, & Stucke, 2001) rather than attitudes and attraction toward the source of the rejection. Furthermore, the majority of these studies investigate aggressive reactions in general; and not aggressive behaviors directed toward the source of the exclusion (Ayduck, Gyurak, Luerssen, 2008; Twenge et al, 2001). That is, research has shown that rejection leads individuals to behave more aggressively toward others who were not involved in the rejection or exclusion manipulation. Additionally, these studies have not investigated attitudes toward the source of the exclusion and if those attitudes change following a perceived cue of like or dislike.

Bourgeois & Leary (2001) did conduct a study that examined attitudes toward the source of rejection. In this study, participants found out that they were picked first or last by a leader to be on a team that would complete a laboratory task. The authors found that those who found that they were picked last rated the team leader as less pleasant and likeable, and lacking in leadership skills. Interestingly, the participants who were picked last did not rate the leader as less desirable as a friend than the participants who were picked first. However, this study assessed reactions to feedback on ability because participants were chosen to be on a team to complete a task. Again, finding out that an authority figure thinks that you are lacking talent may be different than finding out that someone dislikes you.

**Social acceptance.** Research has tended to focus more on responses to social rejection than social acceptance. As mentioned previously, Leary and colleagues (Leary et al., 1995, Leary et al., 1998), have conducted a series of studies that examined changes
in self-esteem following acceptance or rejection cues. These studies have found that social acceptance increases state self-esteem while social rejection or exclusion tends to decrease state self-esteem. Unfortunately, only a few of these studies have actually examined the attitudes toward the source of acceptance (e.g., Bourgeois & Leary, 2001).

**Summary.** In conclusion, the social rejection and acceptance literature suggests that people become angry and hostile after experiencing rejection. In addition, Bourgeois and Leary (2001) found that participants perceive an evaluator less favorably after receiving negative feedback. Again, the specific feedback and response measures utilized in these studies limit the support this body of research can offer to the reciprocal attraction effect.

However, this research brings up an interesting question: does feedback regarding interpersonal attraction cause an increase or decrease in attraction levels in general or just to the source of the feedback? Specifically, it may be that people like *everyone* a little more after receiving positive interpersonal feedback. Likewise, participants may be inclined to report liking everyone less after finding out that someone dislikes them. As mentioned previously, research has shown that following exclusion manipulations, participants behave aggressively to people in general and not just those who rejected the participant (Ayduck, Gyurak, Luerssen, 2008; Twenge et al, 2001). If research reveals that people respond in a more generalized manner following feedback that regards interpersonal attraction, then this finding would have direct and important implications for the reciprocity of attraction theory.
CHAPTER FOUR: CURRENT RESEARCH

In order to provide direct support for the reciprocity of attraction phenomenon, research is needed that improves upon the methodology of previous studies. Accordingly, the current research will utilize feedback that clearly indicates like or dislike from a same-sex peer. Furthermore, participants will be given a chance to interact face-to-face with the target, or the individual whom the feedback regards, before receiving the experimental manipulation. This interaction will allow that participants to form an impression of the target before the participant receives the interpersonal feedback.

To date, only a few studies have demonstrated the actual increase/or decrease in the likeability of an individual after a positive or negative interpersonal evaluation (e.g., Jones, Gergen, & Davis, 1962). Accordingly, the current studies measure perceptions of the evaluator before and after the feedback. By measuring attraction to an individual before the feedback, analyses can be conducted to determine if original levels of attraction moderate the reactions to feedback.

In addition, the present research will explore other potential moderating variables. Previous research has yet to reveal any boundary conditions or variables that moderate the reciprocity of attraction effect. Thus, individual differences in self-esteem (studies 1, 3, and 5), mood (studies 1, 3, and 5), social desirability, (studies 2 and 3), need to belong (study 2), and popularity or likeability (study 5) will be observed to see if they have implications for the reciprocity of attraction phenomenon.

The current research will also determine if interpersonal feedback influences attraction toward others in general or just toward the target (i.e., the individual whom the
feedback regards). Thus, in the current research, the experimental sessions will consist of several participants. Participants will report their attitudes toward everyone, including the target (the individual whom the feedback regards), both before and after the interpersonal feedback is administered.

In addition, it is also important to include alternative implicit and less obtrusive measures of attraction. It may be that people report, but do not actually experience, a change in attraction after finding out someone likes or dislikes them. For example, participants may feel social pressure to match a person’s level of attraction after they find out that individual likes them even though they do not truly feel any different toward the individual. Likewise, a decrease in attraction after negative feedback may simply represent an aggressive act and not an actual change in attraction. Thus, studies three through five employ unobtrusive or implicit measures of attraction.

Finally, there has not been research that has explored the possible effects or outcomes of reciprocal attraction. The current research investigates whether interpersonal feedback influences participants’ memory of the target individual (i.e., the individual whom the feedback regards). It may be that positive feedback results in a positive memory bias whereas negative feedback leads participants to remember more negative information about the target. Studies three and four utilize memory measures in order to test this hypothesis.
CHAPTER FIVE: STUDY 1: FEEDBACK FROM A CONFERENCEATE

In the first study, experimental sessions consisted of four to six same-sex individuals, which included one confederate. Participants were each given time to interact with one another before they received a positive or negative evaluation from the confederate that clearly indicated the confederate’s level of attraction toward the participant. The participants’ evaluation of the confederate was assessed before and after the feedback was administered. In addition, after participants received the interpersonal evaluation, they completed mood and state self-esteem measures.

Method

Participants. Subjects were 39 female and 42 male undergraduates who received partial course credit for their participation. The average age was 19.27 (SD = 1.04). This experiment was a 2 X 2 mixed design. The first independent variable (Feedback: negative or positive) was a between-subjects factor while the second independent variable (Time: time one or time two) was a within-subjects factor.

Measures. At time one, or before the feedback was administered, participants evaluated each group member on physical attractiveness, intelligence, social skills, and overall favorableness on an 11-point scale (e.g., 1 being extremely unintelligent and 11 being extremely intelligent). In addition, each participant rank ordered the other participants from most liked group member to the least liked group member.

After participants received either a positive or negative interpersonal evaluation, they completed the time two measures. Each subject evaluated each group member again on the four dimensions that were assessed at time one (e.g., physical attractiveness, intelligence, etc). Furthermore, participants evaluated every group member on 11
additional items that were not assessed at time one (e.g., popularity, politeness, warmth, etc.) on an 11-point scale (e.g., 1 being extremely unintelligent and 11 being extremely intelligent). Participants also evaluated themselves on the 15 evaluation items. Participants rank-ordered the group members for a second time (i.e. they ordered the participants from most liked to least liked). Participants also ranked the other group members on physical attractiveness, intelligence, and social skills. Each participant also completed the Positive Affect Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1998) and the State Self-Esteem scale (SSES; Heatherton & Polivy, 1991). The SSES consists of 20 items that respondents indicate their agreement with on a five-point scale (1 = not at all, 2 = a little bit, 3 = somewhat, 4 = very much, 5 = extremely). The SSES measures three aspects of state self-esteem: performance, social, and appearance. The coefficient for the entire scale is .92.

Procedure. Subjects were run in groups of 4-6 same-sex individuals; each group included a confederate. Participants were told that the purpose of the current study was to investigate how people form first impressions. Specifically, the experimenter informed the participants the researchers were interested in people’s reactions to themselves and others when meeting same-sexed peers for the first time. Participants were told that they were to complete short evaluations of each group member immediately after meeting them and then later on in the study they would be asked to give more detailed evaluations. Participants were told this so that they would not be suspicious when asked to respond to some of the evaluation items for a second time.

Each participant was then assigned a letter (A-F). The letters allowed the participants to evaluate and rank the group members without using names or other
identifying information. The experimenter also took pictures of each participant in order to create a handout that included a photo of each group member and their corresponding letter. Each participant was given a copy of the handout so they would know each group members’ label when the participants completed the measures.

Participants were allowed three minutes to interact with each group member. Participants were instructed to get to know one another and that they could discuss any topic they wished. However, participants were provided with a handout that included several of the questions from Sedikide’s (1999) closeness induction task (e.g. Where are you from? Do you miss home?) that they could discuss if they wished. Participants interacted with each group member individually and in random order. After the participant met with a group member, they evaluated him or her on physical attractiveness, intelligence, social skills, and overall favorableness. After participants met all of the group members, they rank ordered all of the group members from the group member they liked the most to the group member they liked the least (e.g., the person ranked first would be the most favorite group member and the participant ranked last, or fifth, would the least favorite group member).

Participants were then given five minutes to talk as a group so the researcher could write out the interpersonal feedback. The participants then received feedback from the confederate. Participants read instructions that explained that the subjects in previous studies indicated they would like to receive feedback regarding how the other group members had ranked them. The instructions informed the participants that they would find out how one random group member ranked them. Participants then received the
bogus feedback; they found that the confederate had either ranked them first (positive condition) or last (negative condition) out of all the group members.

Afterwards, the participants completed the time two measures; they evaluated each group member on fifteen items (e.g. warmth, popularity). Embedded in the fifteen items were the four items assessed at time one. Participants also rated themselves on each of the fifteen evaluation items. Participants then rank ordered the group members on likability, physical attractiveness, intelligence, and social skills. Finally, participants completed the PANAS and the SSES.

Finally, all subjects were fully debriefed and checked for suspicions. No participants suspected the involvement of a confederate.

Results

Manipulation check. The manipulation check was the participants’ response to the item that asked them to rate how much they believed the confederate liked them. The manipulation check was significant, $t (79) = 7.94; p < .001, d = 1.78$. Participants in the positive condition thought that the confederate liked them more ($M = 8.51, SD = 1.02$) than participants in the negative condition ($M = 5.86, SD=1.84$). However, the two conditions did not differ in how they believed the other group members liked them, $p > .10$. Gender did not moderate any of the findings and, therefore, is not mentioned for the remaining analyses.

Change in rank-order. A general linear model revealed that the interaction between the feedback and the ranking of the confederate at time one and time two was significant, $F(1, 77) = 18.51, p < .001, \eta_p^2 = .194$. Participants in the two conditions did not differ in their rankings of the confederate at time one, $t(77) = -0.22, p = .827$. (See
Table 1). The two conditions did differ significantly in their rankings of the confederate at time two, $t(79) = 4.01, p < .001$. After the social feedback was delivered, the participants who received positive feedback ranked the confederate significantly higher ($M = 1.95, SD = 1.10$) than the participants received negative feedback ($M = 3.03, SD = 1.23$; Note: higher numbers indicate lower rankings; a ranking of one means the group member was liked more than the other group members). Participants in the negative condition significantly decreased the ranking of the confederate from time one ($M = 2.33, SD = 1.41$) to time two ($M = 3.03, SD = 1.23$), $t(39) = -4.35, p < .001$. Participants in the positive condition significantly increased the ranking of the confederate from time one ($M = 2.39, SD = 1.27$) to time two ($M = 1.95, SD = 1.10$), $t(38) = 2.072, p = .045$. Neither the participants in the positive nor negative condition changed their ranking from time one to time two for groups members from whom they did not receive feedback from, all $p > .05$.

**Change in evaluations.** Participants evaluated the confederate on his or her physical attractiveness, intelligence, social skills and overall favorability both before and after the feedback were administered (See Table 1). The ratings on physical attractiveness, intelligence, and social skills were combined and averaged to form a general impression index. Both time one and time two impression indices had acceptable Cronbach alpha levels (.77 and .73, respectively).

A general linear model revealed that the interaction between experimental condition and evaluation at time one and time two was significant, $F(1, 79) = 39.60, p < .001, \eta_p^2 = .334$. Participants in the positive condition did not differ in their impression of the confederate at time one, $t(79) = .05, p = .833$ (See Table 1). As
expected, the two conditions did differ significantly in their impression rating of the confederate at time two, \( t(70) = -3.91, p < .001 \). After receiving the social feedback, the participants who received positive feedback rated the confederate significantly higher (\( M = 8.53, SD = 0.91 \)) than the participants received negative feedback (\( M = 7.51, SD = 1.41 \)). Participants in the negative condition significantly decreased their impression rating of the confederate from time one (\( M = 8.12, SD = 1.55 \)) to time two (\( M = 7.51, SD = 1.41 \)), \( t(79) = 5.41, p < .001 \), while participants in the positive condition significantly increased their impression rating of the confederate from time one (\( M = 8.18, SE = .21 \)) to time two (\( M = 8.53, SE = .19 \)), \( t(79) = -3.45, p = .001 \). Neither the participants in the positive nor the negative condition changed any of their evaluations from time one to time two for the other participants, all \( ps > .05 \).

The final evaluation that was measured both before and after participants received positive or negative feedback was how favorably they viewed the confederate (See Table 1). A general linear model revealed that the interaction between experimental condition and this evaluation at time one and time two was significant, \( F(1, 79) = 36.58, p < .001, \eta_p^2 = .316 \). Again, participants in the two conditions did not differ on their ratings of the participant before the feedback was administered, \( t(79) = -0.44, p = .664 \). However, the two conditions differed significantly in their rating of the confederate’s overall favorableness after the feedback was administered, \( t(79) = -5.17, p < .001 \). Participants in the positive condition rated the confederate higher on overall favorableness (\( M = 9.21, SD = 0.98 \)) than participants in the negative condition at time two (\( M = 7.69, SD = 1.57 \)). Participants who received negative feedback from the confederate significantly decreased their rating of the confederate’s overall favorableness from time one (\( M = 8.86, SD = \)
1.72) to time two ($M = 7.69$, $SD = 1.57$), $t(79) = 7.49$, $p < .001$. However, participants in the positive condition did not change the ratings of the confederate’s overall favorableness from time one two time two, $t(79) = -1.24$, $p = .221$.

It is important to note that participants’ initial rank of the confederate did not moderate changes in evaluations or rankings, all $ps > .10$. That is, participants who ranked the confederate highly (and thus, liked the confederate) did not change their evaluations more or less than participants who ranked the confederate lower (and did not like confederate as much). However, participants ranked the confederate fairly high ($M_{positive} = 2.38$, $SD_{positive} = 1.27$; $M_{negative} = 2.33$, $SD_{negative} = 1.41$). For both conditions, roughly 80% of the participants ranked the confederate third or higher.

**Between-subject analyses.** Participants completed several evaluations of the confederate that were only measured at time two. Participants rank-ordered all group members on physical attractiveness, intelligence, and social skills. Participants in the negative condition’s mean rank of the confederate on the three dimensions was marginally lower ($M = 2.74$, $SD = .96$) than the mean rank of the participants in the positive condition ($M = 2.38$, $SD = 2.38$, $SD = .92$), $t (79) = 1.68$, $p = .096$, $d = 0.38$. Additionally, there was a significant difference between the two conditions on the 11 evaluation items that were only assessed at time two, $t(71.39) = 6.14$, $p < .001$, $d = 1.35$. The participants in the negative condition rated the confederate lower on the combined evaluation items ($M = 7.20$, $SD = 1.31$) than the participants who received positive feedback ($M = 8.70$, $SD = .86$). Participants in the positive and negative conditions did not differ in their ratings or rakings of the other group members, from whom they did not receive any feedback from, on these time-two only evaluations, all $ps > .05$. 
Subjects also completed several measures intended to assess mood and self-feelings. There were no significant differences between the two conditions on either positive affect, \( t (1, 79) = 1.06, p = .293 \), or negative affect, \( t (79) = .36, p = .718 \). In addition, there were no differences between the positive or negative condition on SSES, \( t (79) = .61, p = .541 \), or any of the three subscales of the SSES, all \( ps > .05 \). Finally, the two conditions did not differ on the self-evaluation of the 15 evaluation items, \( t (79) = .81, p = .420 \).

**Discussion**

The first study was designed to contribute to the body of research that has offered support for the reciprocity of attraction phenomenon. In this study, participants were allowed to naturally interact and form an impression of the confederate before the participants received the interpersonal feedback. In addition, the feedback regarded interpersonal attraction rather than the participants’ attitudes, intelligence or skill level. Furthermore, the participants’ first impressions were measured so that the actual change in attraction toward the confederate could be observed.

The results revealed that participants self-reported attraction toward the confederate did, in fact, change following the interpersonal feedback. Individuals who received positive feedback increased their ranking and evaluations of the confederate while individuals who received negative feedback decreased their ranking and evaluations of the confederate. Importantly, the participants in both conditions did not alter their evaluations of the other group members. This finding suggests that interpersonal feedback does not influence attraction or attitudes toward people in general.
The first study found that the amount of initial attraction felt toward the confederate did not moderate any of the changes in evaluations or ranking. However, the majority of the participants rated the confederate rather favorably. This finding indicated that participants increased their attraction toward another previously liked individual after receiving positive feedback. As explained in the introduction, previous research has not demonstrated if people reciprocate positive attraction with an already liked individual.

Because the confederate was generally well-liked by that majority of participants, there were not very many participants that gave the confederate negative or unfavorable rankings or evaluations. Therefore, it could not be determined if participants are influenced by positive or negative feedback regarding a less-liked individual. Thus, the second study manipulated whether the interpersonal feedback regarded a well-liked or less-liked group member.
CHAPTER SIX: STUDY 2: FEEDBACK FROM THE SECOND FOR FOURTH-RANKED GROUP MEMBER

In the first study, the target group member, or the individual whom the feedback regarded, was a controlled variable. Because confederates were used, every participant received feedback from the same individual. However, the participant’s attraction toward the confederate was an uncontrolled variable. Even though the majority of the participants ranked the confederate favorably, some participants did rank the confederate lower. In the second study, the researchers attempted to control the amount of initial attraction to the target individual, or the group member whom the feedback regarded. This study employed a similar procedure as the first—however, confederates were not utilized; instead, every participant received feedback from either the group member they ranked second or fourth. As stated in the literature review, receiving interpersonal feedback may have different effects depending on whether the feedback regards a more or less desirable individual. The second and fourth-ranked individual was chosen, rather than the first or last-ranked group member) as to avoid a floor or ceiling effect on the dependent variable measures.

In the second study, participants rank-ordered all of the group members on a graphic rating scale. The graphic rating scale was utilized as an alternative means to measure a change in attractiveness toward the group members. In addition, the graphic rating scale may prevent a ceiling or floor effect that is present in a traditional rank-order measure. The graphic rating scale allowed for the relative rank-order of each group member to be observed (e.g., a group member could be ranked third out of the five total group members) as well as placement of each group member on the scale in terms of
physical distance from the midpoint of the scale. That is, study two examined the influence of the interpersonal feedback on the rank-order of a group member as well as the placement of the group members on a graphic rating scale that measured attraction.

Finally, in the second study, participants also completed a social desirability scale and questionnaires that measure individual differences in respondents’ need to belong. It may be that differences in need to belong and social desirability can account for the differences between people who modify their evaluations and those who are not influenced by the interpersonal feedback.

**Method**

**Participants.** A total of 108 subjects participated in the second study. Participants were undergraduate students attending a large mid-western university ($M_{age} = 19.00, SD = 1.11$). The majority of students were female ($n = 96$) and Caucasian. Participants were given partial course credit in exchange for their participation.

**Design.** This study was a $2 \times 2 \times 2$ mixed design. The first independent variable ($Feedback$: *positive* or *negative*) is a between-subjects factor. The second independent variable ($Time$: *time one* or *time two*) is a within-factors variable while the third independent variable ($Target$: $2^{nd}$ ranked or $4^{th}$ ranked) is a between-subjects factor.

**Procedure.** In study two, all experimental sessions consisted of six, same-sexed individuals. After the experimenter obtained informed consent, participants completed the SSES, the Balanced Inventory of Desirably Responding (BIDR), and two questionnaires that intended to gauge participants’ need to belong. The BIDR is a social desirability scales that consists of two subscales: self-deception, or respondent’s tendency to give self-reports that are overly positive, and impression management, or
respondents’ tendency to present oneself in a positive way to others (Paulhus, 1984).

Participants also completed Leary, Kelly, Cottrell, and Schreindorfer’s (2005) Need to Belong Scale. The Need to Belong Scale is a ten-item questionnaire that measures individuals’ differences in the desire to have close, enduring interpersonal relationships.

In addition, participants also answered five questions that assessed how satisfied they were with the amount of friends they had at school. Participants indicated their level of agreement with the following statements: I have a lot of close friends here at [the school]; I feel that I have enough close friends here at [the school]; I wish I could make more close friends at [the school]; and I don’t need any more close friends here at [the school]. All questions were answered on an 11-point scale (with 1 being Strongly disagree, 6 being Neither agree nor disagree, and 11 being Strongly agree).

As in the previous study, participants then met with each group member individually and in random order. After meeting each group member, the participant evaluated him or her on four items (physical attractiveness, intelligence, social skills, and likeability) and ranked-ordered each group member from most-liked to the least-liked. However, in this study, participants used a graphic rating scale to rank-order the five other group members. The graphic rating scale consisted of a 27-centimeter vertical line. The top of the line was marked “The most I have ever liked anyone” while the bottom of the line was labeled “The most I have ever disliked anyone”. The midpoint of the scale (13.5 cm) was marked “Average”. It was explained to participants that the “Average” label meant the average amount of attraction they experience toward someone; or on average, how much they like someone that they are meeting for the first time.

Participants were instructed to write group members’ letter on the line that best represents
how much they liked the group member. The experimenter told participants they could place the group members anywhere they wished on the graphic rating scale and they could put as much physical space between people as they wished.

Participants were then randomly assigned to receive feedback that their second or fourth ranked group member had either ranked them first or last. After participants received the negative or positive interpersonal feedback, they evaluated each participant on various attributes; the four items that were assessed before the feedback was administered were embedded in this measure. In addition, participants ranked order each group member in terms of physical attractiveness, intelligence, social skills, and likeability. Again, all of the items that required participants to rank-order the group members were measured on a graphic rating scale. As with the first graphic rating scale, these four graphic rating scales consisted of a 27-centimeter vertical line. The top of the vertical line was labeled “The most physically attractive / intelligent / social skilled / person I have ever met” while the bottom of the vertical line was labeled “The most physically unattractive / unintelligent / socially unskilled person I have ever met”. The midpoint of the line (13.5 cm) was labeled average. The graphic rating scale that instructed participants to rank-order the participants from the most liked to the least liked was labeled that same as the scale the participants completed before the interpersonal feedback was administered.

Finally, participants reported how accepted they felt (with 1 being rejected, 6 being neutral, and 11 being accepted) and how they felt during the experiment (with 1 being I did not feel part of the group, 6 being neutral, and 11 being I felt part of the group). Finally, participants were funnel debriefed and checked for suspicions.
Results

**Manipulation check.** In the second study, three items served as manipulation checks. Participants indicated how much they thought each group member liked them, how accepted they felt, and how much they thought they were part of a group. Again, all items were measured on an 11-point scale with higher numbers indicating greater liking, more acceptance, or feeling as if one was part of a group during the study. The manipulation check items were analyzed using a one-way ANOVA in SPSS. All post-hoc tests were conducted using the Bonferroni method with a significance level of .05.

A one-way analysis of variance indicated that the experimental conditions significantly differed on how much they perceived that the target individual (i.e., the group member who the feedback regarded) liked them, $F(3, 103) = 31.73, p < .001, \eta^2_p = .316$. Participants who received positive feedback from their second-ranked group member did not differ in how much they reported that the target individual liked them ($M = 9.30, SD = 1.44$) in comparison to participants who received positive feedback from their fourth-ranked group member ($M = 8.78, SD = 1.48$), $t(103) = 1.08, p = .705$. Similarly, participants who received negative feedback from either the second ($M = 5.74, SD = 2.38$) or fourth ranked group member ($M = 5.69, SD = 1.62$) did not differ on much they thought the source of the feedback wanted to be their friend $t(103) = 0.09, p = 1.0$. However, participants who received positive feedback (whether from the second or fourth ranked group member) thought the source of the feedback desired to be their friend more than participants who received negative feedback from either the second or fourth ranked group member, all $p$’s < .001. Importantly, participants in the four conditions did not
differ on how much they thought the other group member’s, from whom they did not receive feedback regarding, desired to be their friend, all $p$’s > .05.

A one-way analysis of variance also indicated that experimental conditions significantly differed on how accepted the participants felt, $F(3, 104) = 8.40, p < .001, \eta^2_p = .108$. Participants who received positive feedback from the second or fourth ranked group member did not differ on how accepted they felt ($M_{\text{second-ranked}} = 9.25, SD = 1.94; M_{\text{fourth-ranked}} = 9.44, SD = 1.48), t(104) = -0.41, p = .976$. Likewise, participants who received negative feedback from the second or fourth ranked group member did not differ on how accepted they reported feeling ($M_{\text{second-ranked}} = 7.93, SD = 1.86; M_{\text{fourth-ranked}} = 7.46, SD = 1.66), t(104) = 0.96, p = .767$. However, people who received positive feedback, either from their second or fourth ranked group member, felt like they were more accepted in comparison to the participants who received negative feedback, all $p$’s < .05.

In addition, a one-way analysis of variance indicated that the final manipulation check, how much the participant felt that they were part of a group, was significant, $F(3, 104) = 5.22, p = .002, \eta^2_p = .07$. As with the previous manipulation check items, participants who received positive feedback from the second ranked group member did not differ on how much they reported feeling like part of a group ($M = 9.18, SD = 1.95$) in comparison to participants who received positive feedback from their fourth-ranked group member ($M = 9.74, SD = 1.32), t(104) = -1.25, p = 1.0$. In addition, participants who received negative feedback from the second ($M = 8.26, SD = 1.79$) or fourth ranked group member ($M = 8.23, SD = 1.56$) also did not differ in how much they perceived to be part of a group, $t(104) = 0.06, p = 1.0$. 
Participants who received positive feedback from their fourth-favorite group member reported feeling significantly more like part of a group in comparison to participants who received negative feedback regarding their second-favorite group member, $t(104) = 3.26, p = .006$, and fourth ranked-group member, $t(104) = 3.28, p = .008$. However, there was not a significant difference in how much participants reported feeling like part of a group between people who received positive feedback from their second-favorite group member and people who received negative feedback from their second or fourth favorite group member, $t(104) = 2.04, p = .265; t(104) = 2.08, p = .240$, respectively.

**Change in rankings.** As mentioned in the methodology section, participants rank-ordered all of the group members on a graphic rating scale. Each group members’ relative rank-order was observed (e.g., group member could have been ranked second out of the five group members) as well as the physical distance of the placement of individual on the graphic rating scale to the midpoint of the scale. Two independent raters measured the distance from each group members’ placement on the line to the midpoint of the scale in centimeters. When the raters’ measurements differed, the average of the two measurements was used. A general linear model indicated that the interaction between feedback and the physical placement on the graphic rating scale was significant, $F(3, 99) = 9.48, p < .001, \eta_p^2 = .223$.

Participants who received positive feedback from their second-favorite group member significant increased their ranking of that individual after they received the positive feedback (See Table 2), $t(25) = 3.07, p = .005$. However, participants did not increase their placement of the second ranked group member in terms of physical
distance on the graphic rating scale, $t(25) = -1.22, p = .234$. Participants who received positive feedback from their fourth-favorite group member significantly increased their rankings of the individual after they received the feedback, $t(22) = 3.87, p = .001$. In addition, participants who received positive feedback significantly increased their fourth-ranked group member on the graphic rating scale after they received the feedback, $t(25) = -2.81, p = .01$ (Note that higher numbers on the graphic rating scale indicate greater attraction toward the group member).

Of the participants who received positive feedback from their second favorite group member, 32.1% did not change their ranking after they received feedback while 50% reciprocated the feedback and increased the ranking of the target individual by one position. 10.7% of participants decreased their ranking of the target by one spot. However, when participants received positive feedback from their fourth-ranked group member, 11.1% did not change their ranking of the target, 59.2% increased their rankings, and 14.8% decreased their ranking of the target by one position. Of the participants who increased their ranking of the group member, 44% increased the target’s ranking by one spot, 50% increased their ranking by two positions, and 6.3% reciprocated the feedback and increased their ranking by three spots.

Participants who received negative feedback from their second-favorite group member significantly decreased their ranking of the target after they received the feedback, $t(25) = -5.74, p < .001$ (see Table 2). In addition, participants who received negative feedback significantly lowered the second-ranked group member on the graphic rating scale after they received the feedback, $t(25) = 3.84, p < .001$. However, participants who received negative feedback from their fourth-ranked group member did
not significantly change their ranking of the source of the feedback, $t(24) = -0.891, p = .382$, or the target group members’ placement on the graphic rating scale, $t(24) = 0.49, p = .627$.

When participants received negative feedback from their second-ranked group member 33.3% did not change their rankings after they received feedback while 62.9% decreased the ranking of the group member. Of the participants who lowered the group member’s ranking, 36.3% decreased their rankings by one spot, 47.1% decreased their ranking by two spots, and 17.6% lowered their rankings by three spots. Out of the participants who received negative feedback from their fourth favorite group member, 42.3% lowered the ranking of the target individual by one spot while 30.8% did not change their rankings after receiving the feedback. 23% of participants increased their ranking after receiving negative feedback regarding their fourth-ranked group member.

A Chi Square analysis indicated that the four conditions differed significantly on the proportion of participants that lowered, raised, or did not modify their ranking of the target group member, $\chi^2 = 36.08, p < .001$. Significantly more participants who receive positive feedback from their second ranked group member raised their ranking of the target in comparison to participants who received negative feedback from their second ranked group member, $Z = 4.38, p < .001$. In addition, significantly more participants who receive negative feedback from their second ranked group member lowered their ranking of the target in comparison to participants who received positive feedback from their second ranked group member, $Z = 3.99, p < .001$. The two groups did not differ on the proportion of participants who did not change their rankings, $Z = 0, p = 1.0$. 
The proportion of participants who receive positive feedback from their fourth ranked group member raised their ranking of the target was significantly higher in comparison to participants who received negative feedback from their fourth ranked group member, $Z = 3.17, p = .002$. In addition, significantly more participants who receive negative feedback from their fourth ranked group member lowered their ranking of the target in comparison to participants who received positive feedback from their fourth ranked group member, $Z = 1.99, p = .047$. The two groups did not differ on the proportion of participants who did not change their rankings, $Z = 1.56, p = .119$.

Importantly, participants did not change their rankings of the other group members from whom they did not receive feedback regarding, all $p$’s $> .05$. Furthermore, participants did not change the position of the other group members on the graphic rating scale, all $p$’s $> .05$.

**Change in evaluations.** As in the previous study, participant’s rating regarding each group members’ intelligence, physical attractiveness, and social aptitude was averaged in order to create an overall impression indice. Participants also indicated how much they liked each group member. Participants evaluated each group member on all of these attributes both before and after the feedback was administered.

A general linear model indicated that the interaction between the type of feedback participants received and the impression measured at both time one and two was significant, $F(3, 103) = 14.01, p < .001, \eta_p^2 = .290$. As indicated in table 2, participants who received positive feedback from the individual they ranked second did not increase their evaluations of the target individual, $t(26) = 1.11, p = .277$. In addition, participants in this experimental condition did not indicate that they liked the group member more
after the feedback was administered, \( t(24) = 0.0, \ p = 1.0 \). Participants who found out the group member they ranked fourth ranked them first did significantly improve their evaluations, \( t(26) = -2.45, \ p = .022 \). However, participants did not rate the group member as more favorable, \( t(26) = -0.431, \ p = .670 \).

Participants who found out that their second-favorite group member ranked them last significantly lowered their impression of the individual, \( t(26) = 5.5, \ p < .001 \) and indicated that the perceived the individual to be less favorable, \( t(26) = 5.15, \ p < .001 \). Similarly, when participants received negative feedback regarding the group member they ranked fourth, they also evaluated the group member more negatively on the combined impression indice, \( t(25) = 3.12, \ p = .004 \), and rated the target as less favorable, \( t(25) = 4.96, \ p < .001 \).

Participants in all conditions did not modify their evaluations of the other group members from whom they did not receive feedback regarding, nor did they report a change in how much they liked the other group members, all \( p \)’s > .05.

**Between-subjects analyses.** After the feedback was administered, the participants rank-ordered the group members on three dimensions (physical attractiveness, intelligence, and social skills). As with the first rank-order scale (i.e., when participants rank-ordered the group members from the most liked to least liked), the rankings for physical attractiveness, intelligence, and social skills were measured on a graphic rating scale. Thus, the relative ranking (the ranking of the group member in regards to the other group members) as well as the physical distance from the midpoint of the graphic rating scale was recorded. The ranking for the three attributes was averaged, as well as the physical measurements, for each group member.
A one-way ANOVA indicated the effect of the experimental manipulation on
the average ranking for the target individual was significant, $F(3, 104) = 14.15, p < .001, \eta^2 = .169$, (See Table 3). Participants who received positive feedback from their second favorite group member ranked that group member more positively in comparison to participants who received negative feedback from their second ranked group member, $t(104) = 4.11, p < .001$. However, participants who received positive feedback from their fourth-ranked group member did not rank that individual differently than participants who received negative feedback from the person they ranked fourth, $t(104) = -2.37, p = .119$.

A one-way ANOVA also indicated the feedback significantly influenced participant’s average placement of the source of the feedback on the graphic rating scales that were used to measure the group member’s level of physical attractiveness, intelligence, and perceived social skills, $F(104) = 4.84, p = .003, \eta^2 = .065$ (See Table 3). Participants who received positive feedback from the group member they ranked second placed the target group member higher on the graphic rating scale in comparison to participants who received negative feedback from their second ranked group member, $t(104) = 2.73, p = .044$ (Note: higher numbers on the graphic rating scale indicate more favorable rankings). However, participants who receive positive or negative feedback from their fourth favorite group member did not differ from one another in terms of the average placement on the graphic rating scale, $t(104) = 1.40, p = .981$.

Participants also evaluated each group member on 11 dimensions (e.g. popularity, warmth, etc.) after they received the interpersonal feedback. The ratings on these 11 evaluation items were averaged. Participants also indicated how much they would like to
be each group members’ friend (See table 3 for means and standard deviations). Two separate ANOVA’s indicated that the feedback significantly influenced the average evaluation and how much the participants desired to be the source’s friend, \( F(103) = 10.60, p < .001, \eta^2_p = .134; F(103) = 16.26, p < .001, \eta^2_p = .191, \) respectively.

People who received positive feedback from their second-ranked group member gave more favorable evaluations in comparison to participants who received negative feedback from the group member they ranked second, \( t(103) = 3.37, p = .007. \) In addition, people who received positive feedback from their second-ranked group member also desired to be that group member’s friend more in comparison to participants who received negative feedback from the group member they ranked second, \( t(103) = 4.96, p < .001. \)

Participants who received positive feedback from their fourth-ranked group member gave more positive evaluations to that person in comparison to participants who received negative feedback from the person they ranked fourth, \( t(103) = 4.04, p = .001. \) People who received positive feedback from their fourth-favorite group member wanted to be that group member’s friend more in comparison to people who received negative feedback from the person they ranked fourth, \( t(103) = 4.53, p < .001. \)

It is important to note the participants in the two experimental conditions did not significantly differ on these evaluations items when they regarded the other group members, all \( p \)’s > .05.

**Individual differences measures.** As stated in the results section, not all participants changed their rankings of the target individual after receiving the interpersonal feedback. A series of analyses were conducted to determine if individuals
who changed their rankings differed from those who did on any other the individual 
difference measures (e.g., Need to Belong, BIDR). None of the analyses approached 
significance, all $p > 0.05$.

**Discussion**

As in the first study, the second study allowed participants to interact with and 
form an impression of the target individuals before receiving the interpersonal feedback. 
However, in the second study, participants received interpersonal feedback from either 
the group member they ranked second or fourth. In addition, participants also ranked the 
group members on a graphic rating scale.

In general, the second study replicated the results from the first study. That is, 
participants demonstrated a change in attraction toward the target group member as 
measured by the rankings, graphic rating scale, evaluation items, or a combination of the 
three. Participants, who received positive feedback, either from their second or fourth 
ranked group member, increased their ranking of the target group member. In addition, 
participants who received positive feedback regarding their fourth ranked member 
increased the position of that person on the graphic rating scale. However, participants 
did not increase the position of their second-ranked group member on the graphic rating 
scale after receiving positive feedback regarding that group member. In addition, 
participants who received positive feedback rated the target group member more 
positively on the items that composed the impression index if the feedback regarded the 
fourth ranked group member but not the second ranked group member.

Participants who received negative feedback from their second group member 
decreased their ranking of the target and lowered the position of the target on the graphic
rating scale. Participants who received negative feedback from their fourth ranked
group member did not modify their ranking of the target group member or lower their
placement on the graphic rating scale. However, participants who received negative
feedback, from either the second or fourth ranked group member, rated the target group
member lower on the impression items after they received the negative interpersonal
feedback.

Overall, participants reciprocated attraction after receiving positive or negative
interpersonal feedback. Participants who received positive feedback from the group
member they ranked second and participants who received negative feedback from the
group member they ranked forth did not change both their ranking and evaluation
measures of the target group member. However, these participants did demonstrate a
change in one of the measures. The third study also utilizes feedback from the second or
fourth ranked individual to see if the results from the second study replicate. In addition,
the participants’ memory regarding the target is observed.
The third study attempted to investigate participant’s memory regarding the target group member. It was hypothesized that participants who received positive feedback would be motivated to encode or recall positive information regarding the target individual while participants who received negative feedback would be motivated to encode or recall negative information regarding the target individual. The motivation to remember an individual in a positive or negative light may be one of the effects of interpersonal feedback. After receiving positive or negative interpersonal feedback, it appears that individuals are motivated to increase or decrease their liking of the source of the feedback. Biased encoding, as well as biased memory retrieval, can help increase or decrease one’s attraction toward the target individual or help to justify the change in attitudes one has experienced. In addition, observing participants’ memory can be construed as an alternative and implicit method of observing that participants’ attraction toward the target has been altered by the interpersonal feedback. As explained in the introduction, it is important to measure attraction using less obtrusive methods in order to rule out the alternative explanation that participants’ change in their self-report is superficial and does not represent a true change in attraction.

A body of psychological research has demonstrated that individuals engage in biased memory processes in order to reach a desired conclusion (see Kunda, 1990). For example, when participants are told that extroverted people are more likely to succeed, they recall more personal instances of being extroverted than introverted. However,
participants who were told that introversion is linked to success, they recall more examples in their life in which they were introverted (Sanitioso, Kunda, & Fong, 1990).

The third study is designed to investigate whether individuals’ memory processes are biased in a similar way after receiving interpersonal feedback. It is predicted that individuals who receive positive feedback will remember more positive information about the target individual (i.e., the person whom the feedback regarded) while participants who receive negative feedback will recall more negative information.

The research regarding stereotypes and person memory also offers support for the hypothesis that interpersonal feedback may influence participants’ memory regarding the target individual. Research shows that our stereotypes and expectations for people and events exert a powerful influence on our memory. That is, people tend to recall information that is consistent with or supporting their stereotypes or expectations. Cohen (1981) demonstrated this hypothesis by informing participants that the woman in a video clip they were going to watch was either a librarian or a waitress. In the clip, the woman engaged in behaviors that were stereotypical of a waitress (e.g., drinking beer) or a librarian (e.g., wearing glasses). The results indicated that recalled more stereotype consistent information than inconsistent. That is, people’s expectations influenced their memory of another individual. This finding could be due to biased encoding (i.e., participants paid attention to stereotypical consistent information and ignored stereotypical inconsistent information), biased retrieval, or both. Whatever the mechanism may be, this research suggests that individuals who have a positive impression of another person and, thus, have positive expectations for that individual will be more likely to remember positive information regarding that person. Likewise, a
person who has a negative impression will be more likely to remember negative information.

There is contradictory research that has revealed that people have superior memory for expectation-inconsistent information (Hastie & Kumar, 1979; Stangor & McMillan, 1992). However, Stangor and McMillan’s (1992) meta-analysis indicated that individuals have superior memory for incongruent information only when individuals have formed a weak impression of the target individual (e.g., through written scenarios). When individuals have formed a strong impression of an individual, they show superior memory for congruent information. It is assumed that the interpersonal feedback is powerful enough to give participants a strong positive or negative impression of the target person (i.e., the individual whom the feedback regards).

In the current study, participants completed a bogus personality questionnaire. After the participants received the interpersonal feedback, they ostensibly received the other group members’ results from the personality questionnaire, which consisted of both positive and negative results. At the end of the study, participants were instructed to recall as much of the personality results as possible. As stated previously, it was predicted that participants who received positive feedback would be more likely to recall the target’s positive personality results while participants in the negative condition would be more likely to recall the target group member’s negative personality results.

**Method**

**Participants.** A total of 84 subjects participated in the third study. Participants were undergraduate students attending a large mid-western university ($M_{age} = 18.86, SD$
= 1.15). All of the participants were female. Participants were given partial course credit in exchange for their participation.

**Design.** This study was a 2 x 2 x 2 mixed design. The first independent variable (*Feedback*: positive or negative) is a between-subjects factor. The second independent variable (*Time*: time one or time two) is a within-factors variable while the third independent variable (*Target*: 2\textsuperscript{nd} ranked or 4\textsuperscript{th} ranked) is a between-subjects factor.

**Procedure.** As with the previous studies, experimental sessions consisted of six same-sexed individuals. Upon arrival, participants were told that they were participating in a study that is interested in how people form first impressions. Participants’ pictures were taken in order to create a handout that served as a memory aid. That is, the handout included each person’s picture and their corresponding label (A, B, C, D, E, or F) so the participants knew the correct labels when evaluating and rank-order the group members.

Next, participants completed the bogus personality questionnaire. Participants were told that the personality questionnaire is a popular and widely used questionnaire in psychology and that the measure has been shown to accurately predict a person’s future behavior. Participants were told that their answers will be analyzed and they will be able to view the results of the questionnaire later on in the study. Participants used a scantron to indicate their responses. Scantrons were used utilized to bolster the authenticity of cover story that the questionnaires would actually be analyzed during the course of the study. In actuality, the personality questionnaire consisted of the State Self-esteem Questionnaire (SSES), the Balanced Inventory of Desirable Responding (BIDR) and the PANAS.
Participants were then given three minutes to interact individually with each group member. After participants met with another group member, they evaluated him or her on four dimensions (intelligence, physical attractiveness, social skills, and overall favorability). Once participants had a chance to meet everyone they were instructed to rank-order the other group members from the group member they liked the most to the group member they liked the least.

Next, the participants were given five minutes to talk as a group. As this was taking place, the experimenter wrote out the interpersonal feedback. Participants were randomly assigned to find out that the group member they ranked second or fourth ranked them first (positive condition) or last (negative condition).

After the five minutes was up, participants received the interpersonal feedback and completed the time two measures. They evaluated each group member on 15 dimensions—four of which were assessed at time one. The participants rank-ordered all of the group members on four dimensions (intelligence, social skills, physical attractiveness, and overall likeability).

Participants then received the bogus personality results. The personality results that were be used in this study are materials from Green, Sedikides, and Gregg’s (2008) research on self-protective memory. This research found that people are much more likely to remember positive feedback regarding their personality, in comparison to negative feedback. In the current study, participants received the other five group members’ results but did not receive their own personality results. The results consisted of behaviors that the group member is likely to engage in according their responses on the personality questionnaire.
Participants read four behaviors for each of the other five group members. For each group member, participants randomly (without replacement) received four pieces of information (1 trustworthy behavior; 1 untrustworthy behavior; 1 kind; 1 unkind). That is, participants received four pieces of information for each of the five group members but they did not read any duplicate personality feedback. Green, Sedikides, and Gregg’s (2008) found that these results were indicative of the traits trustworthy and kind. In addition, Green, Sedikides, and Gregg’s research demonstrated that these two traits were relevant and important to participants.

Participants were told that the researchers are interested as to how accurate people perceive another person’s results after they have just met that individual for the first time. Participants were instructed to read over each group members’ results and rate how accurate they perceived each group member’s results to be. These ratings were not of interest, but were used to bolster the cover story that explained why participants were given the other group member’s results.

After a ten-minute break, participants were then informed that they were going to complete a memory task. Participants were asked to recall the personality results. Participants were instructed to write down all of the results that they could remember as well as the corresponding group member’s letter or the individual who received the result. The remainder of the study was similar to second study: participants indicated how accepted they felt and how much of a group they felt during the study. Finally, participants were carefully debriefed and checked for suspicion.
Results

**Manipulation check.** All manipulation check items were analyzed using a one-way ANOVA in SPSS. All post-hoc tests were conducted using the Bonferroni method with a significance level of .10. A one-way analysis of variance indicated that experimental conditions significantly differed on how much they perceived that the target individual (i.e., the group member who the feedback regarded) liked them, $F(3, 103) = 31.73, p < .001, \eta^2_p = .307$. Participants who received positive feedback from their second-ranked group member did not differ in how much they reported that the target individual liked them ($M = 9.30, SD = 1.44$) in comparison to participants who received positive feedback from their fourth-ranked group member ($M = 8.78, SD = 1.48$), $t(103) = 1.40 , p = .996$. However, participants who received negative feedback from their second ranked group member ($M = 6.24, SD = 2.47$) believed that the target liked them more in comparison to participants who received negative feedback regarding their fourth ranked group member ($M = 4.33, SD = 1.98$), $t(80) = 3.29, p < .009$.

In addition, participants who received positive feedback (whether from the second or fourth ranked group member) thought the source of the feedback liked them more than participants who received negative feedback from either the second or fourth ranked group member, all $p$’s < .001. Importantly, participants in the four conditions did not differ on how much they thought the other group member’s, from whom they did not receive feedback regarding, liked them, all $p$’s > .05.

A second one-way analysis of variance also indicated that experimental conditions significantly differed on how accepted the participants felt, $F(3, 80) = 6.88, p < .001, \eta^2_p = .114$. Participants who received positive feedback from the second or fourth
ranked group member did not differ on how accepted they felt ($M_{\text{second-ranked}} = 8.81, SD = 1.50; M_{\text{fourth-ranked}} = 8.57, SD = 1.99), t(80) = .39, p = 1.0$. Likewise, participants who received negative feedback from the second or fourth ranked group member did not differ on how accepted they reported feeling ($M_{\text{second-ranked}} = 7.43, SD = 2.46; M_{\text{fourth-ranked}} = 6.38, SD = 1.75), t(80) = 1.74, p = .520$. Furthermore, participants who received positive feedback from their second or fourth ranked group member did not report feeling more accepted in comparison to participants who received negative feedback regarding their second ranked group member, all $p$s > .05. However, participants who received positive feedback from their second ranked group member reported feeling more accepted in comparison to participants who received negative feedback from their fourth ranked group member, $t(80) = 2.89, p = .001$.

Finally, another one-way analysis of variance indicated that the final manipulation check, how much the participant felt that they were part of a group, was not significant, $F(3, 80) = 2.55, p = .06, \eta_p^2 = .046$. That is, participants who received positive or negative feedback, either from their second or fourth ranked group member, did not differ on how much they reported feeling like part of the group during the study.

**Change in rankings.** Participants who received positive feedback from their second ranked group member significantly increased their ranking of that individual ($M_{\text{time 2}} = 1.40, SD = 0.60), t(19) = 4.49, p < .001, d = 1.42$ (see Table 4). Specifically, 61.9% of the participants in this experimental condition increased their ranking while 28.6% did not change their rankings of the target individual after the feedback was administered. Only one participant (4.8%) decreased their ranking of the target group member.
Participants who received positive feedback from their fourth ranked group member significantly increased their ranking of the target person ($M_{time\ 2} = 3.14$, $SD = 1.06$) $t(20) = 3.70$, $p = .001$, $d = 1.15$. Over half of the participants (52.4%) in this condition increased their ranking of the target while 42.9% did not modify their rank-order. Only one participant decreased their ranking of the target group member (4.8%). Of the participants who increased the rank-order of the target, 36% increased the rank by one spot, 54.5% increased by two spots, while 9% completely reciprocated the feedback and ranked the target first.

On the other hand, participants who received negative feedback regarding the person they ranked second significantly decreased their ranking ($M_{time\ 2} = 3.15$, $SD = 1.23$), $t(19) = -4.20$, $p < .001$, $d = 1.32$. The majority of the participants (60%) decreased the rank-order of the target group member while a third kept their rankings consistent (33.3%). One person increased their ranking of the target (4.8%). Of the participants who decreased their ranking of the target, 25% decreased the target’s rank by one spot, 50% lowered the rank by two spots, and 25% reciprocated the feedback and ranked the target last.

Finally, participants did not change their rankings of their fourth ranked group member after they received negative feedback ($M_{time\ 2} = 4.24$, $SD = 0.94$), $t(20) = -1.16$, $p = .26$, $d = .36$. However, 47.6% of the participants in this condition did rank the target last after they received interpersonal feedback. A little more than a third of the participants (38.1%) did not modify their rankings while three participants increased their ranking of the target (14%).
A Chi Square analysis indicated that the four conditions differed significantly on the proportion of participants that lowered, raised, or did not modify their ranking of the target group member, $\chi^2 = 32.72, p < .001$. Significantly more participants who receive positive feedback from their second ranked group member raised their ranking of the target in comparison to participants who received negative feedback from their second ranked group member, $Z = 3.98, p < .001$. In addition, significantly more participants who receive negative feedback from their second ranked group member lowered their ranking of the target in comparison to participants who received positive feedback from their second ranked group member, $Z = 3.71, p < .001$. The two groups did not differ on the proportion of participants who did not change their rankings, $Z = 0.34, p = .728$.

The proportion of participants who receive positive feedback from their fourth ranked group member raised their ranking of the target was significantly higher in comparison to participants who received negative feedback from their fourth ranked group member, $Z = 2.62, p = .009$. In addition, significantly more participants who receive negative feedback from their fourth ranked group member lowered their ranking of the target in comparison to participants who received positive feedback from their fourth ranked group member, $Z = 3.16, p = .002$. The two groups did not differ on the proportion of participants who did not change their rankings, $Z = 0.31, p = .757$.

**Change in evaluations.** A general linear model indicated that the interaction between the four conditions and the impression at time one and time two was significant, $F(3, 80) = 3.35, p = .023$, $\eta^2_p = .112$. Participants who received positive feedback regarding their second ranked group member did not change their impression of the target
individual ($M_{time\,1} = 8.64, SD = 1.28; M_{time\,2} = 8.76, SD = 1.11$), $t(20) = -0.66, p = .52$
(See Table 4). In addition, participants did not rate the target group member as more favorable after receiving the interpersonal feedback, ($M_{time\,1} = 9.19, SD = 1.21; M_{time\,2} = 9.24, SD = 1.14$), $t(20) = -0.16, p = .88$. Likewise, participants who received positive feedback regarding their fourth ranked group member did not change their impression of the target individual ($M_{time\,1} = 7.68, SD = 1.48; M_{time\,2} = 7.84, SD = 1.26$), $t(20) = -0.93, p = .37$, or perceive the target to be more favorable, ($M_{time\,1} = 8.05, SD = 1.40; M_{time\,2} = 8.38, SD = 1.50$), $t(20) = -1.44, p = .17$.

However, participants rated the group member they ranked second less positively after receiving negative feedback, ($M_{time\,1} = 8.62, SD = 1.09; M_{time\,2} = 8.03, SD = 1.08$), $t(20) = -0.66, p = .053, d = 0.54$. In addition, they perceived the individual as less favorable, ($M_{time\,1} = 9.14, SD = 1.11; M_{time\,2} = 7.90, SD = 1.51$), $t(20) = 3.13, p = .005, d = 0.94$. In addition, participants rated the group member they ranked fourth more negatively after receiving negative feedback, ($M_{time\,1} = 7.62, SD = 1.36; M_{time\,2} = 7.14, SD = 1.40$), $t(20) = 2.52, p = .02, d = 0.35$. Furthermore, they perceived the individual as less favorable, ($M_{time\,1} = 8.10, SD = 1.51; M_{time\,2} = 6.67, SD = 1.98$), $t(20) = 4.36, p < .001, d = 0.81$.

**Between-subjects analyses.** After participants received the interpersonal feedback, they rank-ordered all group members on physical attractiveness, intelligence, and social skills. The effect of the feedback on the mean ranking of the target group member on these three attributes was significant, $F(3, 79) = 23.09, p < .001. \eta^2_p = .305$. Participants who received positive feedback from the second ranked group member ranked the target group member ($M = 1.96, SD = 0.76$) higher in comparison to the
participants who received negative feedback from the group member they ranked second \((M = 2.93, SD = 0.84), t(79) = -4.13, p = .001\). However, participants who received positive feedback from their fourth ranked group member did not rank the target group member higher \((M = 3.29, SD = 0.65)\) in comparison to the participants who received negative feedback from their fourth ranked group member \((M = 3.84, SD = 0.76), t(79) = -2.39, p = .116\).

Participants also evaluated the group members on 11 items that were only assessed at time 2, \(F(3, 80) = 4.13, p = .009, \eta^2_p = .072\). However, post-hoc analyses revealed that there was no significant difference on these evaluation items between the participants who received positive \((M = 9.01, SD = 1.14)\) or negative feedback \((M = 7.70, SD = 1.11)\) regarding their second ranked group member, \(t(80) = 2.29, p = .148\). In addition, there was no significant difference between the participants who received positive \((M = 8.47, SD = 1.07)\) or negative feedback \((M = 7.15, SD = 1.34)\) regarding the group member they ranked fourth, \(t(80) = 2.31, p = .141\).

However, the interpersonal feedback significantly influenced participants rating of how much they would like to be the target group member’s friend, \(F(3, 80) = 16.39, p < .001, \eta^2_p = .235\). If participant found out that the second-ranked group member had ranked them last than the participants reported less desire to be that group members’ friend \((M = 7.24, SD = 1.81)\) than if the participant had found out that the group member had ranked them first \((M = 9.29, SD = 1.52), t(80) = 3.73, p = .002\). Furthermore, participants indicated they would like to be their fourth ranked group member less after they received negative feedback \((M = 8.00, SD = 1.48)\) in comparison to if they received positive feedback \((M = 5.52, SD = 2.22), t(80) = 4.51, p < .001\). Importantly, participants
in the four conditions did not differ on how much they indicated they would like to be
the other group members’ friend, all ps > .05.

**Memory of personality results.** In this study, participants were given the results
of the personality questionnaire after they received positive or negative feedback. It was
predicted that feedback would influence would bias the participants memory of the
personality results. However, a mixed ANOVA indicated that participants in the
experimental conditions did not differ in the amount of positive or negative information
they recalled regarding the target individual $F(3, 71) = 0.49, p = .693, \eta_p^2 = .020$.

**Individual differences.** Analyses were conducted to see if any of the personality
measures predicted changes in evaluations or rank-order of the target group member.
These analyses all yielded null results.

**Discussion**

The third study utilized a similar procedure as the first two studies: participants
were allowed to interact with the target individual before receiving the interpersonal
feedback. As in the second study, participants received feedback from either the group
member they ranked second or fourth. The results from the third study, for the most part,
replicated the results from second study.

Similar to the second study, in the third study, participants in the negative
condition decreased the rank-order and evaluation of the target group member after
receiving the interpersonal feedback. The results indicated that the initial rank-order of
the target group member did not moderate the results. There was, however, one
exception: participants who received negative feedback from the group member they
ranked fourth did not lower their ranking of this individual. However, participants in this
condition did evaluate the target less favorably as measured by the items that comprised the impression index.

Participants, who received positive feedback from either their second or fourth ranked group member, significantly increased their ranking of that individual after receiving feedback. However, these participants did not change their evaluations of the target group member throughout the course of the experiment. Essentially, the results of the third study mirrored the findings from the second study. The only discrepancy was that participants who received positive feedback from their fourth ranked group member did not significantly increase their impression or evaluation of the target in the third study. Participants in this same condition did significantly increase their evaluation in the second study. However, both studies indicated that people, in one way or another, reciprocated attraction from both a previously liked individual and an individual who was less favored. Thus, the remaining studies do not manipulate level of previous attraction toward the target group member.

The third study intended to extend the results of the first two studies by observing if the interpersonal feedback influenced participants’ memory processes. Unfortunately, the analyses regarding this hypothesis yielded null results. The fourth study offers a second test of the memory hypothesis by using an alternative memory task that involves observing participants’ facial recognition of the target group member.
CHAPTER EIGHT: STUDY 4: FACIAL RECOGNITION REGARDING THE TARGET GROUP MEMBER

The fourth study utilized an alternative memory task. Again, it is hypothesized that the interpersonal feedback motivates participants to recall the target individual in a more or less desirable manner. Thus, in the current study participants’ pictures were morphed, or combined, with both attractive and unattractive models in order create the pictures that were slightly more attractive or unattractive than the original picture. Participants rated how realistic they perceived these pictures to be. It was hypothesized that participants in the positive condition would be more likely to indicate that an attractive picture (i.e., a picture morphed with an attractive model) was the real picture of the target individual while participants in the negative condition would more likely to choose an unattractive picture (i.e., a picture morphed with an unattractive model).

Previous research has shown that people tend to recognize an attractively enhanced photograph as a real picture for both themselves and their friends (Epley & Whitchurch, 2008).

Method

Participants. Participants were 38 undergraduate students. There were 22 females and 16 males ($M_{age} = 19.29, SD = 2.35$). Gender did moderate any of the analysis and will not be mentioned when discussing the results.

Procedure and measures. The fourth study had a similar procedure as the first three studies. Participants’ pictures were taken in order to create a memory aid as well as the the morphed pictures. Participants met with each group member individually and in random order. After meeting each group member, the participant evaluated him or her on
four items (physical attractiveness, intelligence, social skills, and likeability) and ranked-ordered each group member from most-liked to the least-liked.

Participants then received the negative or positive interpersonal feedback. Next, they evaluated and rank-ordered each participant on various attributes; the four items that were assessed at time one were embedded in this time-two measure. It was then explained to the participants that the researchers were interested in memory after meeting people for the first time. Participants were told that they were going to complete a memory task.

Participants were taken to a separate room and presented with seven pictures of each group member. Participants were instructed that only one of the pictures was the real picture of the individual and the rest had been slightly modified. Participants were asked to indicate which picture they thought was the real picture. Participants also indicated how likely they believed each picture was the actual picture (with 0% being *not at all certain* and 100% being *completely certain*). Participants were told that they were completing a memory task and the researchers were interested in the participants’ facial memory of people they had just met. In order to encourage accuracy, participants were instructed told that the memory task was indicative of one’s intelligence level.

The procedure for modifying the pictures was modeled after Epley and Whitchurch (2008). The pictures were modified together using FantaMorph software (www.fantamorph.com). Of the seven pictures, three were morphed with an attractive model’s picture, three pictures were morphed with an unattractive model’s picture, and one picture was left unmodified. The attractive picture was a beauty model and the unattractive model was an individual with a facial disfigurement. Pictures were found on
the Internet and are available through the researcher. Each participant’s picture was morphed 10%, 20%, and 30% with both the attractive and unattractive picture. That is, one picture was 10% the attractive model, one was 20% the attractive model, and another was 30%. Likewise, one picture of each participant was 10% the unattractive model, one was 20% the unattractive model, and the last was 30% the unattractive model.

Finally, participants indicated how accepted they felt and how much of a group they felt during the study. Participants were carefully debriefed and checked for suspicion.

Results

Manipulation check. As in the previous studies, individuals who received negative feedback reported that the target individual, or the group member the feedback regarded, liked them less ($M = 6.26, SD = 1.94$) than the individuals who received positive feedback reported, ($M = 8.89, SD = 1.33$), $t (31.85) = 31.85, p < .001, d = 1.58$. However, individuals in either the positive and negative condition did not differ in how much they reported the other group members liked them, all $ps > .05$.

Individuals who learned that they were ranked first by another group member did not report feeling more accepted ($M = 8.32, SD = 1.80$) than the participants who found out that they were ranked last by another group member ($M = 7.79, SD = 1.62$), $t (36) = 0.81, p = .42$. Additionally, participants who received positive feedback did not report feeling more part of the group ($M = 8.63, SD = 1.95$) than participants who received negative feedback ($M = 8.37, SD = 1.86$), $t (36) = 1.80, p = .67$.

Changes in rank-order. Participants significantly decreased the ranking of the 2nd ranked group member after finding out that the group member had ranked the
participant last, \( M_{time\ two} = 3.24, SD_{time\ two} = 1.03, t(16) = 4.93, p < .001, d = 2.47 \)

(Note: lower numerical values indicate higher rankings. A ranking of one indicates the group member was first; see Table 6). More specifically, 70.5% of the participants in the negative feedback condition decreased their ranking at time two while 29.5% did not modify their rankings during the study. Of the participants in the negative feedback condition who lowered their rankings of the target, 41.7% decreased the ranking of the target by one rank (i.e., they ranked the target third), 41.7% decreased the ranking of the target by two ranks, and 16.7% reciprocated the feedback and ranked the target last.

However, participants in the positive feedback condition, who were informed that their 2\textsuperscript{nd} favorite group member ranked them first, marginally increased their rankings, \( M_{time\ two} = 1.74, SD_{time\ two} = 0.65, t(18) = 1.76, p = .096, d = 0.83 \). Roughly a third of the participants (36.8%) in this condition reciprocated the feedback and ranked the target first.

A Chi-Square test of independence revealed that the two conditions significantly differed in terms of the proportion of participants who lowered, raised, or did not change their rankings after they received interpersonal feedback, \( \chi^2 (2) = 15.75, p < .001 \). The two conditions did not differ on the proportion of participants who did not change their rankings after receiving feedback, \( Z = 1.41, p = 0.16 \). However, significantly more participants in the negative condition, in comparison to the positive condition, increased their ranking of the target, \( Z = -3.69, p < .001 \). Furthermore, significantly more participants in the positive condition, in comparison the negative condition, decreased their ranking of the target, \( Z = 2.79, p < .001 \).
Changes in evaluations. As in the previous studies, the ratings on physical attractiveness, intelligence, and social skills were combined to form a general impression index. A general linear model indicated that the interaction between the two conditions and the impression at time one and time two was marginally significant, $F(1, 36) = 3.41, p = .073, \eta^2_p = .087$. As expected, participants who received negative feedback significantly decreased their impression of the target individual ($M_{time \, 1} = 8.13, SD_{time \, 1} = 0.80; M_{time \, 2} = 7.67; SD_{time \, 2} = 0.97$), $t(18) = 2.79, p = .012, d = 1.32$ (See Table 6). Participants also rated the target group member as less favorable after receiving negative feedback ($M_{time \, 1} = 9.26, SD_{time \, 1} = 1.05; M_{time \, 2} = 7.89; SD_{time \, 2} = 3.32$), $t(18) = 5.12, p < .001, d = 2.41$. However, participants in the positive feedback condition did not significantly improve their rating of the general impression and overall favorableness of the target, $p_s > .10$. In addition, participants in both conditions did not significantly modify their impressions of the other group members from time one to time two, all $p_s > .10$.

Between-subject analyses

After the feedback was administered, the participants rank-ordered the group members on various dimensions (physical attractiveness, intelligence, etc.). Participants who received positive feedback, in comparison to those who received negative feedback, ranked the target, significantly higher ($M = 2.09, SD = 0.78; M = 2.89, SD = 0.84$, respectively), $t(36) = 3.04, p = .004, d = 0.99$. The two conditions did not differ on their mean rankings of the other group members, $p > .10$. Participants also evaluated each group member on 11 dimensions (e.g. popularity, warmth, etc). Participants who received positive feedback evaluated the target higher evaluations more favorably on
these items ($M = 8.62, SD = 1.16$) in comparison to the participants who received negative feedback ($M = 7.64, SD = 1.15$), $t(36) = 2.63, p = .013, d = 0.88$. Participants who received positive feedback also indicated a greater desire to be friends with the target individual ($M = 8.63, SD = 1.74$) in comparison to the participants who received negative feedback ($M = 7.05, SD = 1.65$), $t(36) = 2.87, p = .007, d = 0.96$. It is important to note the participants in the two experimental conditions did not significantly differ on these evaluations items when they regarded the other group members, all $ps > .10$.

**Evaluations of morphed pictures.** At the end of the study, participants evaluated the morphed pictures of each group member. Participants were instructed to pick the picture that they believed was the actual picture of the participant. In the positive-feedback condition, 42.1% of participants chose the picture of the target individual that was 10% morphed with an attractive model in comparison to 26.3% of participants in the negative condition. In addition, 21.1% of participants in the positive condition picked the correct picture in comparison to 47.4% of participants in the negative condition. However, these difference in proportions did not reach significance, $ps > .10$.

The participants also indicated how likely each picture was the actual picture of the group member. The ratings for the three attractive pictures (i.e., the pictures that were morphed with an attractive individual) were averaged, as were the ratings for the three unattractive pictures (i.e., the pictures that were morphed with an unattractive individual). Participants in the positive condition indicated that the attractive pictures were more likely to be the actual photo of the target ($M = 43.79, SD = 25.01$) than the
unattractive pictures ($M = 29.84, SD = 32.01$), $t(18) = 4.10, p = .001, d = 0.49$.

Participants in the positive condition indicated that the attractive pictures were just as realistic as the unattractive pictures for the group members they ranked first, third, fourth, and fifth, all $ps > .10$.

Participants in the negative condition reported the attractive pictures were just as likely to be the real photograph of the target group member ($M = 35.82, SD = 29.77$) as the unattractive pictures ($M = 26.70, SD = 28.51$), $t(18) = 1.62, p = .122, d = 0.31$.

However, participants in the negative condition reported that the attractive pictures were more likely to be the actual picture of the group member in comparison to the unattractive pictures for the group member they ranked first, ($M_{\text{attractive}} = 28.21, SD_{\text{attractive}} = 21.53; M_{\text{unattractive}} = 21.31, SD_{\text{unattractive}} = 17.06$) $t(15) = 1.815, p = .09, d = 0.36$, and the third-ranked group member, ($M_{\text{attractive}} = 30.71, SD_{\text{attractive}} = 21.97; M_{\text{unattractive}} = 21.31, SD_{\text{unattractive}} = 14.69$), $t(14) = 2.204, p = .045, d = 0.50$. Participants in the negative condition indicated the attractive pictures were just as realistic as the unattractive pictures for the group member they ranked fourth and fifth, all $ps > .10$.

Participants also rated their own pictures. Participants in the negative-feedback condition did not differ on how realistic they rated the attractive pictures ($M = 23.52, SD = 15.88$) in comparison to the unattractive pictures ($M = 20.09, SD = 19.36$), $t(17) = 0.90, p = .38, d = 0.19$. However, participants in the positive condition indicated that the attractive pictures of them self was more likely to be real ($M = 30.54, SD = 26.04$) than the unattractive pictures ($M = 19.44, SD = 19.65$), or their pictures that had been morphed with an unattractive model, $t(12) = 2.34, p = .007, d = 0.48$. 
Discussion

In the fourth study, participants in the negative condition decreased their ranking and impression of the target individual after receiving the interpersonal feedback. This pattern of results replicates the findings from the first three studies. Participants who received positive interpersonal feedback marginally increased the ranking, but not their impression, of the target individual. This replicates the results from the second and third study. In the first study, participants in the positive condition did increase their impression of the target individual.

However, participants in the positive condition demonstrated a positive bias toward the target group member in the morphed picture task. That is, after receiving positive feedback, participants thought that the attractively enhanced pictures of the target individual were more realistic than the unattractive pictures. The participants did not demonstrate this bias for any of the other group members. Participants in the negative condition did not demonstrate this positive bias for enhanced pictures for the target group member (second ranked), as well as their fourth and fifth ranked group member. However, participants in the negative condition did demonstrate a positive bias for the individuals they ranked first or third by indicating that the attractive pictures for these individuals were more realistic than the unattractive photographs.

These findings support previous research that has demonstrated that people think that attractively enhanced pictures of people they like are more realistic than that person’s actual picture (Epley & Whitchurch, 2008). It appears that the negative feedback is removing this positive bias. After receiving the interpersonal feedback, participants in the negative condition no longer like the target individual and are not remembering that
person as more attractive. The results from this study offer evidence that the interpersonal feedback may have an influence on the memory regarding the target individual.

It is important to note that the participants in the positive condition believed that their attractive pictures were more realistic than their unattractive pictures. Interestingly, the participants in the negative condition did not demonstrate this self-enhancement bias. Perhaps the interpersonal rejection has lowered participants’ self-esteem but the explicit measures used in the previous studies were unable to detect the change in state self-esteem.
CHAPTER NINE: STUDY 5: IMPLICIT MEASURE OF ATTRACTION

In the fifth study, an implicit measure was added to the procedure. As stated in the introduction, previous research has indicated that individuals tend to respond aggressively after experiencing interpersonal rejection (Ayduck, Gyurak, Luerssen, 2008; Twenge et al, 2001). Thus, the changes in ratings and evaluations observed in the negative condition in the present research may only represent an aggressive act and not an actual change in the level of attraction. Likewise, participants who received positive feedback may have only provided higher evaluations because they felt it was socially acceptable behavior and not because they actually liked the target group member more. Therefore, in the fifth study, participants completed a customized implicit association test (IAT) to see if they formed a negative or positive association with the target group member after receiving positive or negative feedback. If participants demonstrate an evaluative association with the person whom the feedback regarded then there would be evidence that participants are actually experiencing a change in the amount of attraction toward that individual, and not just changing their rankings or evaluations due to hostility or social desirability.

The fifth study also observed several possible moderator variables. As mentioned previously, not all participants change their evaluations or rankings of the target individual. The fifth study looked to see if baseline, or prior, mood and state self-esteem moderated reactions to interpersonal feedback. In addition, participants’ popularity, or how well-liked they were by the other participants, was calculated. Again, previous observational research had demonstrated that popularity influences reciprocal relationships (Clark & Ayers, 1988; Clark & Drewery, 1985). Accordingly, the fifth
study utilized a large sample size in order to determine if popularity of the either the participants or the target individuals, is a potential moderator.

Additionally, participants responded to additional mood and state self-esteem measures both before and after the feedback was administered. Bourgeois and Leary (2001) found that individuals who lowered their evaluations of the individual who rejected them were able to maintain their positive mood. The researchers hypothesized that derogation served as a buffering function that protected the participants against the mood effects of negative interpersonal feedback. Thus, in the fifth study, a variety of explicit and implicit mood and self-esteem measures were employed to see if participants who altered their ranking or evaluations of the target demonstrated a displayed a different pattern of mood and self-esteem in comparison to participants who did not alter their evaluations.

Method

Participants. Participants were 120 undergraduate students from a mid-sized Midwestern university. The average age was 18.73 ($SD = 3.17$). Six participants were removed from data analysis because they were suspicious of the interpersonal feedback (final $N = 114$). This resulted in a final data set of 44 men (38.6%) and 69 women (60.5%). Gender did not moderate any of the analyses and, thus, will not be mentioned when discussing the results.

Measures. In the fifth study, participants completed several measures that were not employed in the previous studies. First of all, several additional mood and state self-esteeems measures were utilized. The participants still completed the SSES; however, the long-version PANAS was used instead of the short version. Participants also completed
the state self-esteem words (Leary, 1999) and Buckley’s mood adjectives (2004). These self-report questionnaires have been shown effective in observing mood and state self-esteem changes in previous research that has investigated interpersonal rejection (Leary, 1999; Buckley, 2004).

Several implicit measures were also utilized in the current study. Right after receiving the interpersonal feedback, participants completed an implicit mood measure. This measure asks the participant to name five words that start with the letter H (Isen, Labroo, & Durlach, 2004). Previous research has shown that people in positive moods give more creative answers. Furthermore, the participants also completed a customized IAT that compared their implicit preference of the 2\textsuperscript{nd} ranked group member to the 3\textsuperscript{rd} ranked group member. Participants were asked to pair the photo of each group member with words that are positive or negative in meaning. By comparing the reaction time of each task, it can be ascertained whether the participant has an evaluative preference for either the 2\textsuperscript{nd} or 3\textsuperscript{rd} ranked group member. In addition, participants also wrote an essay describing why they would be the ideal employee for his or her dream job. Participants were given a chance to read the other group members’ essay and rank-ordered the other group members essays from best written to worst written.

**Procedure.** The fifth study utilized a similar procedure and cover story as the previous studies. Again, experimental sessions consisted of four to six same-sexed individuals. At the beginning of the study, participants completed the SSES, PANAS, state self-esteem words, and mood adjectives before meeting one another. Participants were then given five minutes to write an essay explaining why they would be the ideal job candidate to a potential employee.
As in the previous studies, participants were then given three minutes to interact individually with each group member. After the participant met with a group member they evaluated him or her on four dimensions (intelligence, physical attractiveness, social skills, and overall favorability). Once participants had a chance to meet with one another they were instructed to rank-order the other group members from the group member they liked the most to the group member they liked the least. Participants were then given five minutes to talk as a group so the researcher could write out the interpersonal feedback. Each participant was randomly assigned to find out that the group member he or she had ranked second either ranked the participant first (positive condition) or last (negative condition).

Next, participants completed the time two measures. First, the participants completed the implicit mood measure (i.e., the H-task). Then they evaluated each group members on 15 dimensions—four of which were assessed at time one. The participants also rank-ordered all of the participants on the same four dimensions utilized in the previous studies (i.e., physical attractiveness, intelligence, and social skills). Participants then completed the self-esteem and mood measures.

Next, participants completed the IAT. Participants were told that the researchers were interested in how people respond to pictures of people they have recently met versus pictures of people they have not met. Participants were told that they were going to complete a task that involves pictures of the other group members while other participants would complete the task with pictures of strangers.

Next, participants read the other group members essays and rank ordered them from the best written to the worst written. Finally, participants also reported how
accepted they felt (with 1 being rejected, 6 being neutral, and 11 being accepted) and how they felt during the experiment (with 1 being I did not feel part of the group, 6 being neutral, and 11 being I felt part of the group). Finally participants were probed for suspicions and carefully debriefed.

**Results**

**Manipulation check.** As in the previous studies, individuals who received negative feedback reported that the target (the participant whom the feedback regarded) liked them less ($M = 5.60, SD = 1.97$) than the individuals who received positive feedback reported, ($M = 8.63, SD = 1.36$), $t(101.29) = 9.56, p < .001, d = 1.79$. However, the individuals in the positive and negative condition did not differ in how much they reported the other group members liked them, all $ps > .05$.

Individuals who found out that they were ranked first by another group member did not report feeling more accepted ($M = 8.32, SD = 1.71$) than the participants who found out that they were ranked last by another group member ($M = 8.00, SD = 1.62$), $t(112) = 1.03, p = .305, d = 0.19$.

Additionally, participants who received positive feedback reported feeling marginally more part of the group ($M = 8.84, SD = 1.47$) than participants who received negative feedback ($M = 8.31, SD = 1.65$), $t(42) = 1.80, p > .074, d = 0.34$.

**Changes in rank-order.** Participants in both conditions did not change their rankings of the other group members (from whom they did not receive feedback from) from time one to time two, all $p > .05$. However, a general linear model indicated that the interaction between the two conditions and the rank-order at time one and time two was significant, $F(1, 111) = 82.02, p < .001, \eta^2_p = .425$. Participants significantly decreased
the ranking of the 2\textsuperscript{nd} ranked group member after finding out that the group member had ranked the participant last, \(M_{\text{time two}} = 3.28, SD_{\text{time two}} = 1.10\), \(t(56) = 8.81, p < .001\) (Note: lower numerical values indicate higher rankings. A ranking of one indicates the group member was first; see Table 7). More specifically, 70.18\% of the participants in the negative feedback condition decreased their ranking of the target at time two while 28.1\% did not modify their rankings during the study. Of the participants in the negative feedback condition who lowered their rankings of the 2\textsuperscript{nd} ranked individual, 37.5\% decreased the ranking of the individual by one rank, 32.5\% decreased the ranking of the individual by two ranks, and 30\% reciprocated the feedback and ranked the 2\textsuperscript{nd} ranked group member last.

In addition, participants in the positive feedback condition, who were informed that their 2\textsuperscript{nd} favorite group member ranked them first significantly increased their rankings of the individual, \(t(56)= -2.88, p = .006\). Approximately 30.4\% of the participants in this condition reciprocated the feedback and ranked the group member first.

A Chi-Square test of independence revealed that the conditions significantly differed in terms of the proportion of participants who lowered, raised, or did not change their rankings after they received interpersonal feedback, \(\chi^2 (2) = 51.35, p < .001\). Significantly more participants in the positive condition, in comparison to the negative condition, did not change their rankings from time one to time two, \(Z = 3.93, p < .001\). In addition, there were more participants in the positive condition, in comparison to participants in the negative group, that increased their ranking of the target, \(Z = 3.85, p < .001\). A significantly greater proportion of participants in the negative condition lowered
their rankings of the target, in comparison to the proportion of participants in the positive condition, \( Z = 7.00, p < .001 \).

**Changes in evaluations.** As in the previous studies, the ratings on physical attractiveness, intelligence, and social skills were combined to form a general impression index. Participants in both conditions did not significantly modify their impressions of the other group members from time one to time two, all \( ps > .10 \). As expected, a general linear model indicated that the interaction between the two conditions and the impression at time one and time two was significant, \( F(1, 112) = 24.43, p < .001, \eta^2_p = .179 \).

Participants who received negative feedback significantly decreased their impression of the target individual or the second-favorite group member (\( M_{time 1} = 8.19, SD_{time 1} = 1.43; M_{time 2} = 7.24, SD_{time 2} = 1.44 \), \( t(57) = 6.14, p < .001 \) (See Table 7). Participants also rated the target individual as less favorable after receiving negative feedback (\( M_{time 1} = 8.33, SD_{time 1} = 1.20; M_{time 2} = 8.59, SD_{time 2} = 3.32 \), \( t(57) = 7.31, p < .001 \). However, participants in the positive feedback condition did not significantly improve their rating of the general impression and overall favorableness of the target individual, \( p \)’s > .10.

**Changes in mood and state self-esteem.** The participants in both conditions did not report a significant difference in state self-esteem or mood from time one to time two as measured by the SSES, PANAS, Leary’s state self-esteem words, or Buckley’s mood adjectives all \( ps > .10 \).

**Between-subject analyses.** Immediately after participants received the interpersonal feedback, they were instructed to write down the first 5 H-words that came to mind. Again, this measure serves as an implicit mood check as previous research has demonstrated that individuals in positive moods tend to generate less common (or more
creative) words than individuals in negative moods (Isen, Labroo, & Durlach, 2004). A creativity indice for each participant was computed. This indice was simply a logarithmic value of the number of internet websites each response retrieved on an Internet search engine (i.e., Google). When a word is found on a relatively small number of websites, it is assumed to be more unique and, thus, more creative. Thus, for each response participants gave, it was determined how many websites that word yielded in an internet search. The logarithm of the average number of websites for each participant was then computed. An independent samples t-test revealed that participants who received positive feedback did not generate more unique words ($M = 21.58, SD = .80$) than the participants who received negative feedback ($M = 21.65, SD = .86$), $t (112) = 0.445, p = .657$.

Participants were instructed to rank-order the group members on several dimensions (i.e., physical attractiveness, social skills, and intelligence). The average rank of these three dimensions was computed for each group member. Participants rank-ordered the target individual lower than if the participant had received positive feedback regarding the target ($M = 2.36, SD = .75$) than if they had received negative feedback ($M = 2.77, SD = .85$), $t (112) = -2.84, p = .006, d = 0.51$. Participants in the two conditions did not differ on the average ranking of the other group members, all $ps > .05$.

Participants also evaluated all group members on several attributes (e.g., popularity, warmth, etc.) that were only assessed after the interpersonal feedback was delivered. Participants evaluated the target individual more favorably if the feedback was positive ($M = 8.40, SD = 1.18$) than if the feedback had been negative ($M = 7.30, SD =
1.42), \( t(112) = 4.49, p < .001, d = 0.84 \). Participants in both conditions did not evaluate the other group members differently, all \( ps > .05 \).

Participants reported how much they would want to be each group members’ friend. If participant found out that the second-ranked group member had ranked them last than the participants reported less desire to be that group members’ friend (\( M = 6.69, SD = 1.76 \)) than if the participant had found out that the group member had ranked them first (\( M = 8.48, SD = 1.48 \)), \( t(112) = 5.88, p < .001, d = 1.10 \). Again, participants in the two conditions did not differ on who much they would like to be a friend of the other group members, all \( ps > .05 \).

In addition, participants wrote a short essay explaining why they would be the ideal employee. After participants received positive or negative feedback, they were instructed to read all of the group members’ essays and rank order them from best written to worst written. There was a significant difference in the rank of the essay by the target individual, \( t(112) = -3.11, p = .01, d = 0.59 \). The negative condition ranked the essay lower (\( M = 3.16, SD = 1.34 \)) than the positive condition (\( M = 2.39, SD = 1.27 \); Note: Higher numbers indicate lower rankings. A ranking of 1 indicated that the participant was ranked first and had the best essay out of all the other participants).

**Customized IAT results.** The IAT data was analyzed by computing an effect size that captured the difference in participants’ reaction time when they paired the targets’ picture with bad word versus good words. A positive effect size indicates an implicit preference for the target group member; that is, the participant was faster when asked to pair the target’s picture with good words. Likewise, a negative effect size
represents a negative bias toward the target group member or the participant was faster to respond when they had to pair the target’s picture with negative words.

The IAT analysis revealed that participants who received positive feedback had an evaluative preference \((M = 0.24, SD = .40)\) toward the target individual (the second-ranked individual) in comparison to the individual they had ranked third, \(t(42) = 3.81, p < .001, d = 0.85\). However, participants who received negative feedback did not appear to have a preference \((M = 0.05, SD = .46)\) for either the target individual or the participant that they ranked third (i.e., the mean effect size did not significantly differ from 0), \(t(50) = 0.733, p = .467, d = .015\). Furthermore, participants in the positive condition had a stronger preference \((M = 0.24, SD = .41)\) for the target individual than participants in the negative condition \((M = 0.05, SD = .46)\), \(t(92) = 2.10, p = .039, d = 0.44\).

The participants made marginally more errors when pairing the target’s photo with positive words if they had received negative feedback \((M = 4.41, SD = 3.26)\) than if they had received positive feedback \((M = 2.89, SD = 3.17)\), \(t(92) = 1.77, p = .08, d = 0.47\). The participants in both conditions did not differ on how many errors they made when pairing the target’s photo with negative words, \(t(52) = -0.86, p = .392\).

**Moderation analyses.** As stated earlier, not all of the participants (in both the current and previous studies) reciprocated the feedback and changed the rank of the target group member. In the fifth study, roughly 30% of the participants in the negative feedback condition and 70% of the participants in the positive condition did not modify the rank of the group member after the participant received the interpersonal feedback.

Thus, several moderation analyses were conducted to determine if any individual differences are responsible for reciprocating attraction. Exploratory analyses indicated
that participant’s popularity (i.e. the average ranking they received from the other group members), the target’s popularity, baseline state self-esteem, and baseline mood did not moderate any of the change in rankings or evaluations toward the target individual, all $p$s > .10.

**Discussion**

As with the previous studies, the results from the fifth study demonstrate evidence of reciprocal attraction. Participants in the negative condition lowered their rank order and evaluation of the target individual while participants in the positive condition increased their ranking but not evaluation of the target group member. Notably, participants in the positive condition did show an implicit preference for the target individual, as indicated by the IAT analyses. However, the participants in the negative condition did not demonstrate a negative association with the target group member. This may be because the negative words in the IAT task were too severe (e.g., war, evil, etc.). Perhaps if moderately negative words were utilized (e.g., fight, bad, etc.), participants in the negative condition would have displayed significantly different reaction times. It is important to note that participants in the negative condition did have marginally more errors when pairing the picture of target individual with positive words.

However, there is an alternative explanation for the IAT results. Again, the positive condition preferred the second-ranked individual to the third-ranked individual. However, we might expect this finding from a control condition, or a condition in which participants did not receive any type of interpersonal feedback. Participants in the negative condition did not show a preference for either the second or third-ranked group member. It may be that the feedback is influencing these participants IAT results;
however, it is removing the positive bias for the second ranked group member. That is, instead of preferring the second to the third, these participants are not showing an evaluative preference. A future study should include a traditional control group in order to determine if the feedback is influencing participants in the negative condition, positive condition, or both.

Both the explicit and implicit mood measures and the explicit state self-esteem measures failed to capture a change in mood and self-feelings after receiving either positive or negative feedback. These results are contrary to the Leary’s (1999) research on social belongingness and self-esteem. However, participants who received negative feedback did not report feeling less accepted or less part of the group than participants who received positive feedback. This finding suggests that the manipulation used in this study is tapping into a different phenomenon than social exclusion manipulations.

Finally, the fifth study failed to reveal any significant moderating variables. Participants’ popularity, self-esteem, or mood did not determine whether they were influenced by the interpersonal feedback or not. There still may be boundary conditions to the reciprocity of attraction phenomenon; however, the current research suggests the phenomenon is fairly robust and not influenced by several major individual difference variables.
CHAPTER TEN: STUDY 6: FIELD STUDY: FEEDBACK FROM SORORITY CHAPTERS

The previous studies documented the phenomenon of reciprocal attraction in a controlled laboratory setting. An observational study would supplement the experimental findings and increase the validity or confidence in the reciprocity of attraction rule. As mentioned in the literature review, several observational studies have demonstrated reciprocal attraction; however, the majority of these studies only demonstrated that individuals express similar levels of attraction toward one another (e.g., Chapdelain, Kenny, & LaFontana, 1994; Clark & Ayers, 1988; Kenny & Nasby, 199). The previous experimental studies demonstrated that individuals report a change in attraction after being randomly assigned to receive positive or negative interpersonal feedback. There has not been an observational study that has observed the change in attitudes in individuals in response to interpersonal feedback.

The sorority member recruitment process is a real-life social event that provides opportunities to investigate the reciprocity of attraction rule following explicit, yet natural, interpersonal feedback. Formal recruitment for sororities is a procedure that narrows the potential new member’s seven favorite sororities down to three. Throughout the recruitment procedure, the potential members report their preferred sororities and receive feedback from those sororities as to whether the attraction was reciprocated. The process that potential members go through is highly similar to the procedure that the participants completed in the first five experimental studies. In both cases, individuals meet new people, rank order their attraction toward the various people (or sorority houses), and receive feedback regarding much the given individual (or house) liked them.
Participants in the first two studies found that another individual ranked them first or last; potential sorority members find out if a top ranked sorority house has invited them back for a certain event or not.

**Method**

**Participants.** Participants were 106 undergraduate females attending a Women’s Panhellenic Association’s formal recruitment at a large midwestern university. The mean age of the participants was 18.31 ($SD = 0.56$).

**Procedure & Measures.**

**The Formal Recruitment Process.** The schedule for the formal recruitment process can be found in Appendix A. The formal recruitment process consisted of five events over a ten-day period. During the first event, potential members met all nine sorority chapters on campus and indicated their top seven houses and rank-ordered the last two chapters. These last two chapters are considered potential members’ “back-up houses”. Later on, potential members found out which of their seven houses invited them back for the second event. If one of the seven sorority houses rejected a given potential member, then the eighth-ranked sorority house could have invited the woman to the second event. If two or more houses rejected a potential member, they could have received invitations from both the 8th and 9th ranked house.

During the second event, the women visited the houses that had extended invitations (a maximum of seven houses). At the end of the second event, each potential member reported their top five houses and their two “back-up houses.” At the third event, the women visited a maximum of five sorority houses that they received invitations from. Before the third event, the potential members indicated their top three
houses and two “back-up” sorority chapters. The process continues to repeat: at the fourth event, the members visited the sororities who reciprocated the invitation. However, at the end of the fourth event, the potential members rank-ordered their three favorite sorority houses in order of which houses they wished to join. At the fifth event, the members found out if they had received a bid (i.e., an invitation to become a new member). If the first ranked sorority houses rejected the potential member, they could have received a bid from the second-ranked house. If the second-ranked house did not extend an invitation to join, the third-ranked house could have offered a bid.

**Measures.**

The study required that participants complete four questionnaires throughout the formal recruitment process (see Appendix A). Participants were informed they were participating in a study that was interested in potential members’ attitudes and preferences throughout the recruitment process. Participants were sent an email at the appropriate time that contained an internet link to a survey site where they could complete the questionnaires.

**Time One Questionnaire.** Participants completed the first questionnaire after the first event. The questionnaire asked the participants to rank-order the nine sororities houses (with 1 being their favorite house, 2 being their second favorite house, and so on). Participants were also asked to report the houses that they reported as their top seven. Participants also completed three evaluation questions regarding each sorority houses. Specifically, participants were asked to rate how desirable it was to be a member of each sorority, how much they liked the members of each sorority, and how friendly they perceived the members of each sorority on an 11 point scale (e.g., with 1 being “The un-
friendliest group of people I have ever met”, 6 being neutral, and 11 being “The friendliest group of people I have ever met”).

**Time Two Questionnaire.** The second questionnaire asked the participants to rank-order the nine sorority houses, report which houses they visited during the second event, and report the houses they indicated as their top five.

**Time Three Questionnaire.** The third questionnaire asked the participants to rank-order the nine sorority houses, report which houses they visited during the third event, and report the houses they indicated as their top three.

**Time Four Questionnaire.** The fourth questionnaire asks the participants to indicate what houses they visited during the fourth event and the final rank ordering of their top three houses. Participants were also asked what sorority offered them a bid and if they accepted the bid. Next, participants were asked to rank-order all nine houses from their favorite house to their least favorite house. Participants then completed six evaluation items for each sorority. Three of the evaluation items were the same items that were asked in the time one questionnaire; participant were also asked to rate how popular, physically attractive, and intelligent they perceived the members of each sorority to be on a 11 point scale (e.g. 1 being “The most un-intelligent group of people I have ever met”, 6 being neutral, and 11 being “The most intelligent group of people I have ever met”).

Finally, participants completed several reaction items. They were asked to characterize their feelings during recruitment on an 11-point scale with 1 being rejected, 6 being neutral, and 11 being accepted. Additionally, participants were asked to report their agreement with several items on a, 11-point scale with 1 being strongly disagree, 6
being *neutral*, and 11 being *strongly agree*. The statements were as follows: I had fun during recruitment; my feelings were hurt during recruitment; I felt part of a group during recruitment; and I like the way recruitment is set up.

**Analysis.** Because participants reported both the houses they indicated at their top 7, 5, and 3 and which houses they visited during the various events, the researchers were able to ascertain the type of feedback the participants received from each sorority house. For each sorority house, there is a possibility of one of four types of feedback. The first type is accepting a bid; this means the sorority house invited the participant back to every single event, offered the participant a bid to join, and the participant accepted. In other words, the participant expressed attraction toward a sorority and the sorority reciprocated the attraction.

The second type of feedback is that the sorority rejected the participant at some point during the process. That is, the participant continually indicated the sorority as their top choice but the sorority did not issue an invitation at some point. The third possibility, or type of feedback, is that the participant rejected the sorority after the first event. This means the participant did not indicate the sorority as a top seven and they did not receive enough rejections to be able to receive an invitation from that sorority. In other words, the participant rejected the sorority and never received any feedback from the sorority. The final possibility, or type of feedback, is the participant did receive positive feedback (i.e., invitations) from the sorority but at some point did not indicate the sorority as her top choice. Thus, the participant received positive feedback from the sorority for up to four events until the participant rejected the house.
It was predicted that participants would increase their evaluations of the sorority house that they joined. On the other hand, participants were predicted to lower their evaluations of the sorority houses that rejected them. Participants who rejected the sorority would increase their evaluations of the sorority because they received positive feedback from that house until the participants decided that house was not a good fit. The evaluations regarding houses that were rejected after the first event were not analyzed because the participants did not receive any feedback from these houses.

**Results**

The average participant experienced rejections from 3.83 sorority chapters (SD = 2.48). With the exception of 13 participants, every woman accepted a bid from a sorority (i.e., they were accepted into the sorority as a new member). That is, out of 106 participants, 13 either were rejected from every single sorority house or they rejected a bid from a given sorority house.

As in the previous studies, the participants did not appear to have affective reactions to any rejections from the sorority houses. Participants reported feeling somewhat accepted during recruitment (M = 8.02, SD = 2.93). The participants, on average, also indicated an agreement with the statements “I had fun during recruitment” (M = 8.31, SD = 2.41), “I felt like I was part of a group during recruitment” (M = 8.29, SD = 2.64), and “I like the way recruitment is set up.” (M = 7.32, SD = 2.93). In addition, participants indicated slight disagreement with the statement “My feelings were hurt during the recruitment process” (M = 5.13, SD = 3.74).

The three evaluation items that were assessed at both time one and time one were averaged for the house that participants received a bid from. A dependent t-test
indicated that participants increased their mean evaluation after they received a bid from a sorority chapter ($M_{time1} = 9.16, SD_{time1} = 2.06; M_{time2} = 10.22, SD_{time2} = 1.17$), $t(85) = -5.41, p < .001, d = 0.63$.

The evaluation items were averaged for all of the houses participants were rejected from. A t-test indicated that participants significantly decreased their mean evaluation of these houses after they were rejected, ($M_{time1} = 8.02, SD_{time1} = 1.29; M_{time2} = 7.21, SD_{time2} = 1.69$), $t(100) = 5.62, p < .001, d = 0.54$. Likewise, all of evaluation items were averaged for the house participants rejected at some point during recruitment. Participants did not change their evaluations for these houses ($M_{time1} = 6.65, SD_{time1} = 1.59; M_{time2} = 6.48, SD_{time2} = 2.16$), $t(95) = 0.80, p = .426$. In addition, participants did not change their mean evaluation for the houses they rejected after the first event, ($M_{time1} = 4.61, SD_{time1} = 1.53; M_{time2} = 4.72, SD_{time2} = 1.72$), $t(61) = -0.56, p = .576$.

**Discussion**

The sixth study was a naturalistic study that examined women’s attitudes during a sorority recruitment event. The results from this field study replicated the findings from the previous laboratory studies. Participants increased their evaluation of the sorority they received a bid (i.e., positive feedback) from and decreased their evaluation of the sorority chapters that they were rejected from. The fact that participants’ attraction was influenced by the rejection supports the reciprocity of attraction rule. Chapters that rejected participants were originally houses that the women indicated as a preferred sorority (i.e., the participant hoped receive an invitation from). However, the failure of the sorority to extend an invitation led participants to report less attraction toward that chapter.
Participants did not modify their evaluation of the houses that they, themselves, rejected or decided they were not interested in joining. Reciprocal attraction would predict that participants would increase their attraction toward these houses because the house administered positive feedback to the participants. However, the fact that participants did not lower their evaluation of the house that the participants rejected rules out a plausible alternative hypothesis. It could be argued, or predicted, that participants would lower their impression of all of the sorority chapters that they, ultimately, did not end up joining. That is, an alternative hypothesis could be that after participants join a sorority, they increase their liking toward the sorority they are a member of and decrease their attraction toward the rest of the sorority chapters. This alternative explanation would be consistent with research on post-decisional cognitive dissonance (e.g., Brehm, 1956) or the research on in-group favoritism (e.g., Tajfel & Turner, 1979; Tajfel, 1970). However, the results indicated that participants only lowered their evaluations of a given sorority if they were rejected from that chapter.
CHAPTER ELEVEN: STUDY 7: FACIAL RECOGNITION REGARDING THE TARGET GROUP MEMBER

The fourth and fifth study aimed to demonstrate reciprocal attraction using an unobtrusive measure. As mentioned previously, if interpersonal feedback influences participants response to unobtrusive measures, then there is evidence that the results represent an actual change in attraction rather than a superficial change in self-report. As mentioned previously, participants may just report an increase or decrease in attraction due to social norms. Alternatively, in the negative condition, the lowered rank-order and evaluation of the target may just be an act of aggression or hostility.

Accordingly, the fourth study included a morphed picture test, in which participants rated how realistic pictures were that had been modified to appear more or less physically attractive. This study found that participants in the positive condition found the target’s attractively enhanced photographs more realistic in comparison to the target’s pictures that had been altered to appear less attractive. Participants in the negative condition did not demonstrate a positive or negative bias toward the target on this measure. That is, participants who received negative feedback rated the target’s attractive pictures just as realistic as their unattractive pictures. However, as mentioned previously, the lack of the control group limited the interpretation of the results. That is, it is unknown as to whether the interpersonal feedback resulted in a positive bias in the positive condition, eliminated a positive bias in the negative condition, or both. Thus, the seventh study was the proposed study that attempted to replicate and improve upon the results of the fourth study by adding an experimental control condition.
Method

Participants. A power analysis was conducted to determine the appropriate number of participants needed for a 3 X 2 design with a small effect size (f = .10). This analysis revealed that a total of 300 participants (100 per experimental condition) was needed to achieve a power of .58. An additional analysis revealed that a sample size of 120 participants (40 per condition) would result in a power of .26. Participants were 129 undergraduate students. There were 81 females and 48 males (M\text{age} = 19.40, SD = 2.93).

Gender did moderate any of the analysis and will not be mentioned when discussing the results.

Design. The seventh study was a 3 X 2 mixed design. The first independent variable (Feedback: positive, negative, or control) was a between-subjects factor while the second independent variable (Time: time one or time two) was a within-factors variable.

Procedure and measures. The seventh study had a similar procedure and cover story as the previous laboratory studies. All experimental sessions consisted of four to six same-sexed individuals. Upon arrival, participants were told that they were participating in a study that was interested in how people form first impressions. More specifically, the participants were told that the researchers were interested in how people meet for the first time, how people feel when they are meeting someone for the first time, and how people evaluate or form impressions after meeting someone for the first time. After informed consent was obtained, participants’ pictures were taken in order to create a handout that served as a memory aid. The handout included each person’s picture and their corresponding label (A, B, C, D, E, or F) so the participants knew the correct labels
when they evaluated and rank-ordered the group members. Participants’ pictures were also used for the facial recognition task.

Participants then completed Leary, Kelly, Cottrell, and Schreindorfer’s (2005) Need to Belong Scale. The Need to Belong Scale is a ten-item questionnaire that measures individuals’ differences in the desire to have close, enduring interpersonal relationships (See Appendix B for Need to Belong Scale). In addition, participants also answered five questions that assessed how satisfied they were with their amount of friends (See Appendix C for the Friend Questionnaire).

Participants were then given five minutes to interact individually with each group member (See Appendix D for list of the “Getting to know you” questions). After the participants met with a group member they evaluated him or her on four dimensions (intelligence, physical attractiveness, social skills, and overall favorability; See Appendix E for the time one evaluations). Once participants met every group member, they were instructed to rank-order the group members from the person they liked the most to the person they liked the least (See Appendix F for time one rankings).

Next, participants were given five minutes to talk as a group. During this time, the experimenter wrote out the interpersonal feedback. Participants were randomly assigned to find out that the group member they ranked second ranked them first (positive condition), last (negative condition), or they did not receive any interpersonal feedback (control condition; See Appendix G for the introduction to the interpersonal feedback).

Participants then received the interpersonal feedback and completed the time two measures. They evaluated each group member on 15 dimensions—four of which were assessed at time one (See Appendix H for the time two evaluations). The participants
then rank-ordered all of the other group member on four dimensions (intelligence, social skills, physical attractiveness, and overall likeability; See Appendix I for the time two ranking measure).

Participants were then taken to a separate room and presented with seven pictures of each group member. Participants were instructed that only one of the pictures was the real picture of the individual and the rest had been slightly modified. Participants were asked to indicate which picture they thought was the real picture (See Appendix J for Picture Questionnaire). Participants also indicated how likely they believed each picture was the actual picture (with 0% being not at all certain and 100% being completely certain). Participants were told that they were completing a memory task and the researchers were interested in the participants’ facial memory of people they had just met.

The procedure for modifying the pictures was modeled after Epley and Whitchurch (2008). The pictures were modified together using FantaMorph software (www.fantamorph.com). Of the seven pictures, three were morphed with an attractive model’s picture, three pictures were morphed with an unattractive model’s picture, and one picture was left unmodified. The attractive picture was a beauty model and the unattractive model was an individual with a facial disfigurement. Each participant’s picture was morphed 10%, 20%, and 30% with both the attractive and unattractive picture. That is, one picture was 10% the attractive model, one was 20% the attractive model, and another was 30%. Likewise, one picture of each participant was 10% the unattractive model, one was 20% the unattractive model, and the last was 30% the unattractive model.
Finally, participants reported how accepted they felt (with 1 being rejected, 6 being neutral, and 11 being accepted) and how they felt during the experiment (with 1 being I did not feel part of the group, 6 being neutral, and 11 being I felt part of the group; See Appendix K for the manipulation check questionnaire). Finally, participants were funnel debriefed and checked for suspicion.

Results

Manipulation check. A one-way ANOVA revealed that the interpersonal feedback was effective, $F(2, 125) = 48.77, p < .001, \eta^2_p = .281$. Individuals who received positive feedback reported that the target individual liked them more ($M = 9.05, SD = 1.34$) in comparison to the participants in both the control condition and the negative condition ($M = 5.20, SD = 2.52$), $t(125) = 1.21, p = .018, t(125) = 9.57, p < .001$, respectively. Participants in the negative condition believed that the target individuals like them less in comparison to participants in the control condition, $t(125) = -7.07, p < .001$.

Contrary to the previous studies, a one-way ANOVA revealed that the three conditions significantly differed on how much they perceived that the other group members liked them, $F(2, 125) = 4.85, p = .009, \eta^2_p = .038$. Individuals who received positive feedback, in comparison to participants in the negative condition, reported that the other group members liked them more, $t(125) = 3.08, p = .007$. However, there was no significant difference between the positive and control condition, $t(125) = 1.15, p = .488$, or the control and negative condition, $t(125) = 2.10, p = .113$, regarding perceptions of how much they were liked by the other group members.
The remaining two manipulation check items (i.e., how accepted and part of a group the participants felt) were combined to create a composite measure of acceptance. A one-way ANOVA revealed that interpersonal feedback significantly influenced how accepted the participants felt, $F(2, 123) = 7.45, p = .001, \eta^2_p = .043$. Individuals who received positive feedback reported feeling more accepted ($M = 8.93, SD = 1.44$) than participants in the negative condition ($M = 7.48, SD = 2.15$), $t(123) = 3.59, p = .001$. Participants in the negative condition felt less accepted ($M = 8.70, SD = 1.74$) in comparison to participants in the control condition, $t(123) = -3.10, p = .007$. There was no significant difference between the participants in the positive condition and the control condition, $t(123) = 0.60, p = .820$.

**Changes in rank-order.** A series of one-sample t-tests were conducted to determine if participants significantly changed their ranking of the target from time one to time two. These analyses compared the sample mean rank at time two to a population mean of two at time one. A one-sample t-test was employed since every participant received feedback from their second ranked group member.

Participants in the positive feedback condition, who were informed that their 2nd favorite group member ranked them first, did not increase their rankings ($M_{\text{time two}} = 1.79$, $SD_{\text{time two}} = 0.78$), $t(37) = -1.671, p = .103, d = .549$ (Note: lower numerical values indicate higher rankings. A ranking of one indicates the group member was first). However, approximately a third of the participants (36.8%) in this condition reciprocated the feedback and ranked the target first.

Participants significantly decreased the ranking of the 2nd ranked group member after finding out that the group member had ranked the participant last, ($M_{\text{time two}} = 3.16$,
SD_{time\ two} = 1.23, t(37) = 6.33, p < .001, d = 2.081. More specifically, 63.2% of the participants in the negative feedback condition decreased their ranking at time two while 34.2% did not modify their rankings during the study. Of the participants in the negative feedback condition who lowered their rankings of the target, 33.3% decreased the ranking of the target by one rank (i.e., they ranked the target third), 45.8% decreased the ranking of the target by two ranks, and 20.8% reciprocated the feedback and ranked the target last.

Participants in the control condition significantly decreased the ranking of the target, (M_{time\ two} = 2.29, SD_{time\ two} = 0.77, t(41) = 2.39, p = .021, d = .747. Half of the participants in this condition did not change their rankings of the target at time two; a third of participants (33.3%) decreased their ranking of the target at time two, while 10.9% increased their rankings.

A Chi-Square test of independence revealed that the three experimental conditions significantly differed in terms of the proportion of participants who lowered, raised, or did not change their rankings after they received interpersonal feedback, $\chi^2 (4) = 31.07, p < .001$. The three groups did not differ on the proportion of participants who did not change their rankings from time one to time two, all $ps > .05$. However, more participants in the positive condition, in comparison to participants in the negative and control group, increased their ranking of the target, $Z = 3.75, p < .001$, $Z = 2.62, p < .001$, respectively. There was no significant difference in the proportion of the participants who increased their ranking of the target in the negative and control condition, $Z = -1.57, p = .116$. 
More participants in the negative condition, in comparison to participants in the positive and control group, lowered their ranking of the target, $Z = 4.76, p < .001$, $Z = 2.67, p = .007$, respectively. In addition, more participants in the control lowered their ranking of the target in comparison to the proportion of participants in the positive condition, $Z = 2.44, p = .015$.

**Changes in evaluations.** As in the previous studies, the ratings on physical attractiveness, intelligence, social skills, and overall favorableness were combined to form a general impression index. A general linear model indicated that the interaction between the three conditions and the impression at time one and time two was significant, $F(2, 125) = 21.69, p < .001$, $\eta_p^2 = .258$. Participants in the positive condition did not significantly increase their impression of the target individual ($M_{\text{time 1}} = 8.68, SD_{\text{time 1}} = 1.09; M_{\text{time 2}} = 8.75; SD_{\text{time 2}} = 1.04$), $t(41) = 2.79, p = .599$. However, participants who received negative feedback significantly decreased their impression of the target individual ($M_{\text{time 1}} = 8.48, SD_{\text{time 1}} = 1.04; M_{\text{time 2}} = 8.33; SD_{\text{time 2}} = 1.05$), $t(39) = 6.57, p < .001$. Participants in the control condition also significantly decreased their impression of the target individual ($M_{\text{time 1}} = 8.30, SD_{\text{time 1}} = 1.42; M_{\text{time 2}} = 8.07; SD_{\text{time 2}} = 1.39$), $t(45) = 2.23, p = .031$. Participants in all three conditions did not significantly modify their evaluations of the other group members, all $ps > .05$.

**Between-subject analyses.** After the feedback was administered, the participants rank-ordered the group members on various dimensions that were not assessed at time one (physical attractiveness, intelligence, etc.). A univariate analysis of variance indicated the effect of the experimental manipulation on the average ranking for target was significant, $F(2, 121) = 3.34, p = .039$, $\eta_p^2 = .052$. Participants who received positive
feedback, in comparison to those who received negative feedback, ranked the target significantly higher ($M = 2.38, SD = 0.78$; $M = 2.82, SD = 0.80$, respectively), $t(121) = -2.51, p = .40$. However, there was no significant difference between the positive and control condition ($M = 2.51, SD = 0.81$), $t(121) = -0.73, p = 1.00$, or between the negative and control condition on the mean ranking variable, $t(121) = 1.84, p = .206$. The three conditions did not differ on their mean rankings of the other group members, $p > .05$.

Participants also evaluated each group member on 12 dimensions (e.g. popularity, warmth, etc). A univariate analysis of variance indicated that the interpersonal feedback significantly influenced the average evaluation of the target, $F(2, 125) = 11.83, p < .001, \eta^2 = .159$. Participants who received positive feedback evaluated the target higher evaluations more favorably on these items ($M = 8.64, SD = 1.19$) in comparison to the participants who received negative feedback ($M = 7.27, SD = 1.27$), $t(125) = 4.84, p < .01$, and marginally more favorable in comparison to participants in the control condition ($M = 8.04, SD = 1.34$), $t(125) = 2.19, p = .091$. Furthermore, participants in the control condition evaluated the target more favorably in comparison to participants in the negative condition, $t(125) = 2.80, p = .018$. It is important to note the participants in the three experimental conditions did not significantly differ on these evaluations items when they regarded the other group members, all $ps > .05$.

**Evaluations of morphed pictures.** At the end of the study, participants evaluated the morphed pictures of each group member. Participants were instructed to which picture they believed was the actual picture of the participant. A Chi-square analysis revealed that there was not a significant difference between the three conditions
regarding the picture that participants believed was the real picture of the target, 
\( \chi^2(14) = 11.82, p = .620 \).

The participants also indicated how likely it was that each picture was the actual picture of the group member. The ratings for the three attractive pictures (i.e., the pictures that were morphed with an attractive individual) were averaged, as were the ratings for the three unattractive pictures (i.e., the pictures that were morphed with an unattractive individual). A general linear model revealed a main effects for the ratings of the pictures, \( F(1, 104) = 38.00, p < .001, \eta_p^2 = .268 \). Participants rated the attractive pictures as more realistic (\( M = 42.24, SD = 23.48 \)) than the unattractive pictures (\( M = 27.57, SD = 17.87 \)). However, this main effect was not qualified by an interaction with the interpersonal feedback, \( F(2, 104) = 1.52, p = .225, \eta_p^2 = .028 \).

Participants also rated their own pictures. A general linear model revealed that participants rated their attractively enhanced pictures (\( M = 36.21, SD = 21.54 \)) as more realistic than the unattractive pictures (\( M = 19.73, SD = 18.42 \)), \( F(1, 99) = 51.49, p < .001, \eta_p^2 = .342 \). However, this main effect was not qualified by an interaction with the interpersonal feedback, \( F(2, 99) = 0.60, p = .552, \eta_p^2 = .012 \).

**Individual difference measures.** A series of exploratory analyses were conducted to determine if any of the Need to Belong measures predicted changes in evaluations or rank-order of the target group member. These analyses did not yield significant results.

**Discussion**

The seventh study was a replication of the fourth study with an addition of an experimental control condition. Again, the control condition was added to see if the
interpersonal feedback was influencing the participants in the positive condition, negative condition, or potentially participants in both conditions. The results from this study largely replicated the results from the previous studies: that is, participants in the negative condition lowered both their ranking and evaluation of the target group member. However, participants in the positive condition did not raise their ranking or evaluations of the target. This finding is somewhat inconsistent with the results of the previous studies. In the previous studies, participants in the positive condition typically raised their ranking, but not their evaluation, of the target member.

The results from the control condition can help interpret the results from the seventh study as well as the previous studies. The results revealed that participants in the control condition actually lowered both their ranking and evaluation of the group member. However, fewer participants in the control condition lowered their ranking of the target in comparison to the proportion of participants in the negative condition. Thus, the participants in the negative condition were, in fact, affected by the interpersonal feedback. When taking the control condition into account, it appears that the participants in the positive condition were also influenced by the interpersonal feedback. Even though participants in the positive condition did not report liking the target more, they still demonstrated a positive bias toward the target in comparison to participants in the control condition.

The finding that participants in the control condition lowered both their ranking and evaluation of the target was unexpected. These results are confusing as participants in all three conditions did not change their evaluations of the other group member. It is unknown as to why participants in the control condition, who did not receive any
interpersonal feedback, modified their evaluation of the target but not the other group members.

The seventh study also employed an unobtrusive measure of attraction by having participants rate the target member’s photos that had been altered to appear more or less attractive. The fourth study found that participants in the positive condition rated the target’s attractively enhanced pictures as more realistic than the target’s unattractive photographs. Participants in the negative condition did not differ on their ratings of the target’s attractive and unattractive photographs. However, the seventh study failed to replicate this finding: participants in all three experimental conditions rated the target’s attractive photographs just as realistic as their unattractive photographs. It is unknown as to why the seventh study failed to replicate the results from the fourth study. The seventh study employed more participants and, thus, had greater power. The significant results from the fourth study may have been a type one error that resulted from a small sample size.

Alternatively, it is possible that experimental error could be responsible for the seventh study’s null results. In the fourth and seventh study, different research assistants morphed all of the participants’ pictures. It may be that the research assistants that were employed during the fourth study were more skilled than the research assistants that were utilized during the seventh study. That is, the research assistants in the seventh study may have morphed the pictures in a way that made it more obvious to the participants that they were altered, and thus unrealistic, photographs.
CHAPTER TWELVE: GENERAL DISCUSSION

The current research demonstrated the reciprocity of attraction phenomena using both experimental and naturalistic methods. These studies attempted to offer direct support of the reciprocity of attraction phenomenon by employing a procedure that included a valid operational definition of interpersonal attraction and allowed participants to interact with, and form an impression of, the target individual. In the experimental studies, study sessions consisted of four to six same-sex individuals. Participants were each given time to interact with one another before they received positive or negative feedback regarding another participants’ attitude. The feedback informed the participants that another participant (i.e., the target) had either ranked them first (or last) out of all of the group members. The manipulation check analysis revealed that this feedback successfully manipulated interpersonal attraction: in all of the studies, participants in the positive condition, in comparison to participants in the negative condition, indicated that the target individual liked them more.

Participants were also allowed to interact with the group members before receiving the interpersonal feedback. In addition, participants’ evaluation of each group member was assessed both before and after the feedback was administered. This procedure allowed for an actual change in attraction toward to target, as well as the other group members, to be observed. The studies indicated that, in general, participants demonstrated reciprocal attraction. That is, participants tended to like the target more after receiving positive feedback and participants tended to dislike the target after receiving negative feedback.
In the majority of the studies, participants in the negative condition decreased the ranking and evaluations of the target group member. The one exception was the condition in the second and third study in which participant received negative feedback regarding their fourth ranked group member. In this condition, participants did not decrease the rank or the position of the target member on the graphic rating scale. However, they did rate the target group member less favorable on the items that comprised the impression index.

The effects of positive interpersonal feedback were not as consistent as the results regarding the negative feedback. In the majority of the studies, participants who received positive feedback significantly increased their rankings of the target group member. However, participants did not increase their evaluations of the target group member (with the exception of the first study). Participants in the positive condition did show an implicit positive bias toward the target group member as measured by the IAT task in the second study and the morphed picture task in the fourth study. However, the results from the morphed picture task did not replicate in the seventh study.

An important finding from this research is that participants only altered their evaluation of the target individual and not the other group members. Previous research had yet to determine if interpersonal feedback influenced attraction toward others in general or just toward the target (i.e., the individual whom the feedback regards). Studies one through five, as well as the seventh study, consistently demonstrated that participants only changed their evaluations of the target individual and not the other group members.

The second, third, and fifth studies examined the influence of prior attraction on reciprocal attraction. In the second and third study, participants reciprocated attraction
with both a favorite and less favorite group member. In the fifth study, the target group members’ popularity was computed, (i.e., the average ranking the target received from all of the other group members) and a moderation analysis yielded null results. That is, participants were just as like to reciprocate attraction with a more popular group member as they were with a less popular group member.

However, this does not mean that prior attraction or popularity does not influence reciprocal attraction. It may be that individuals are more or less likely to reciprocate attraction with a highly popular or disliked people but the present research did not include enough of these individuals. Extremely popular and unpopular individuals are not typical and were, most likely, not included in the majority of the experimental sessions. Future research may be able to test this hypothesis by utilizing a confederate who is well liked or disliked by the average person. However, such a study would have to design alternative measures to observe attraction as a typical Likert scale would be susceptible to a ceiling and floor effect.

The current research also tested additional possible moderating variables. Various individual difference variables such as self-esteem, mood, need to belong, social desirability, and popularity were not found to have an influence on reciprocal attraction. Future research can test other possible moderator variables as a significant number of individuals failed to demonstrate this phenomenon. It may be that a common factor is leading participants to report a consistent level of attraction toward the target despite receiving positive or negative interpersonal feedback.

The current research also intended to demonstrate the influence of interpersonal feedback on participants’ memory regarding the target group member. The third study
tested participants’ memory of the target group member’s favorable and unfavorable results from a personality questionnaire. Unfortunately, the results indicated that participants did not differ in the amount of positive and negative results they recalled.

Finally, the fourth, fifth, and seventh study aimed to demonstrate reciprocal attraction using an unobtrusive measure. As mentioned previously, it is important for research to demonstrate reciprocal attraction using a less obtrusive measure in order to rule out the possibility that the data is simply representing a change in self-reports or an act of hostility rather than a true change in attraction. Accordingly, the fifth study included a customized IAT, which compared participants’ implicit preference for the second-ranked group member (the target group member) versus the third-ranked group member. The results indicated that participants in the positive condition had a positive bias for the target group member but the participants in the negative condition did not demonstrate a positive or negative bias. In the fourth study, participants in the positive condition indicated that a photograph that had been modified to enhance the target group members’ physical attractiveness was more realistic. As mentioned previously, the lack of the control group in both the fourth and fifth study limited any interpretation of the results. Unfortunately, the seventh study, which did employ a control condition, failed to replicate this finding.

Thus, it is recommended that future research employ alternative obtrusive measures as it is important to know whether reciprocal attraction represents an actual or superficial change in interpersonal attraction. In addition, as mentioned previously, future research should also test additional moderating variables to determine the boundary conditions of this grand theory. It is important for research to determine if
there any characteristics, of either the participant or the target, that influences the likelihood that interpersonal attraction will be reciprocated.
REFERENCES


### APPENDIX A: FIELD STUDY SCHEDULE

<table>
<thead>
<tr>
<th>Event #1</th>
<th>Meet 9 houses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Give top 7 houses</td>
</tr>
</tbody>
</table>

**TIME ONE**

- **QUESTIONNAIRE**
  - Rank & Evaluate all nine houses
  - Report top seven houses

<table>
<thead>
<tr>
<th>Event #2</th>
<th>FEEDBACK: Find out which 7 picked you</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Meet max. 7 houses</td>
</tr>
<tr>
<td></td>
<td>Give top 5 houses</td>
</tr>
</tbody>
</table>

**TIME TWO**

- **QUESTIONNAIRE**
  - Report feedback (i.e., what houses you received an invitation from)
  - Rank all nine houses;
  - Report top 5

<table>
<thead>
<tr>
<th>Event #3</th>
<th>FEEDBACK: Find out which 5 picked you</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Meet max. 5 houses</td>
</tr>
<tr>
<td></td>
<td>Give top 3 houses</td>
</tr>
</tbody>
</table>

**TIME THREE**

- **QUESTIONNAIRE**
  - Report feedback
  - Rank all nine houses
  - Report top 3

<table>
<thead>
<tr>
<th>Event #4</th>
<th>FEEDBACK: Find out which 3 picked you</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Meet max. 3 houses</td>
</tr>
<tr>
<td></td>
<td>Give top 3 houses (FINAL RANKING)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event #5</th>
<th>FEEDBACK: Find out which house offered a bid</th>
</tr>
</thead>
</table>

**TIME FOUR**

- **QUESTIONNAIRE**
  - Report feedback from Preference night and Bid day
  - Rank and evaluate all nine houses
APPENDIX B: NEED TO BELONG SCALE

Instructions: For each of the statements below, indicate the degree to which you agree or disagree with the statement by writing a number in the space beside the question using the scale below:

1 = Strongly disagree
2 = Moderately disagree
3 = Neither agree nor disagree
4 = Moderately agree
5 = Strongly agree

1. If other people don't seem to accept me, I don't let it bother me.
2. I try hard not to do things that will make other people avoid or reject me.
3. I seldom worry about whether other people care about me.
4. I need to feel that there are people I can turn to in times of need.
5. I want other people to accept me.
6. I do not like being alone.
7. Being apart from my friends for long periods of time does not bother me.
8. I have a strong need to belong.
9. It bothers me a great deal when I am not included in other people's plans.
10. My feelings are easily hurt when I feel that others do not accept me.
APPENDIX C: FRIEND QUESTIONNAIRE

1. What year are you in? (Ex: 1\textsuperscript{st} year, 2\textsuperscript{nd} year, etc)

Please use the rating scale provided to indicate your agreement or disagreement with the following statements.

2. I have a lot of close friends here at OU.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Neither agree nor disagree</td>
<td></td>
<td></td>
<td></td>
<td>Strongly agree</td>
<td></td>
</tr>
</tbody>
</table>

3. I feel that I have enough close friends here at OU.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Neither agree nor disagree</td>
<td></td>
<td></td>
<td></td>
<td>Strongly agree</td>
<td></td>
</tr>
</tbody>
</table>

4. I wish I could make more close friends at OU.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Neither agree nor disagree</td>
<td></td>
<td></td>
<td></td>
<td>Strongly agree</td>
<td></td>
</tr>
</tbody>
</table>

5. I don’t need anymore close friends here at OU.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Neither agree nor disagree</td>
<td></td>
<td></td>
<td></td>
<td>Strongly agree</td>
<td></td>
</tr>
</tbody>
</table>
**APPENDIX D: POSSIBLE QUESTIONS TO ASK**

**Possible questions to ask:**

1. What is your first name?
2. Where are you from?
3. What do you think you might major in? Why?
4. What are your hobbies?
5. If you could travel anywhere in the world, where would you go and why?
6. What is one thing happening in your life that makes you stressed out?
7. Do you miss your family?
8. If you could have one wish granted, what would that be?
9. Is it difficult or easy for you to meet people? Why?
10. What is one thing about yourself that most people would consider surprising?
APPENDIX E: TIME 1 EVALUATIONS

Participant A

1. How physically attractive did you find this person to be?

1 2 3 4 5 6 7 8 9 10 11
Not at all attractive Average Extremely attractive

2. How intelligent did you find this person to be?

1 2 3 4 5 6 7 8 9 10 11
Not at all intelligent Average Extremely intelligent

3. How socially skilled did you perceive this person to be?

1 2 3 4 5 6 7 8 9 10 11
Not at all socially skilled Average Extremely socially skilled

4. Overall, how favorable did you find this person to be?

1 2 3 4 5 6 7 8 9 10 11
Not at all favorable Average Extremely favorable
APPENDIX F: TIME I RANKING

Please rank order the people that you just met, with one being group member that you liked the most and five being the group member that you liked the least.

➔ Please do not include yourself in the ranking.

1. __________________________
2. __________________________
3. __________________________
4. __________________________
5. __________________________
Forming First Impressions

PLEASE READ: The study you are participating in, “Forming First Impressions”, has been an experiment at Ohio University for the past three years. Previous participants have indicated that it would be beneficial to receive feedback—that is, find out the impressions the other group members formed of them. Therefore, participants in this study now find out how their second favorite group member ranked them. On the next page you will find out how the person you ranked second ranked you. After reading the feedback, please continue on to the other questionnaires.
APPENDIX H: TIME 2 EVALUATIONS

Participant A

Please use the following scale to answer the following questions about Participant A:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
</tr>
<tr>
<td>Average</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
</tr>
<tr>
<td>Extremely</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
</tr>
</tbody>
</table>

1. _____ How interesting would you find this person to be?
2. _____ How nice did you find this person to be?
3. _____ How physically attractive did you find this person to be?
4. _____ How energetic did you find this person to be?
5. _____ How intelligent did you find this person to be?
6. _____ How polite did you find this person to be?
7. _____ How socially skilled did you perceive this person to be?
8. _____ How popular did you perceive this person to be?
9. _____ How knowledgeable did you find this person to be?
10. _____ How outgoing did you find this person to be?
11. _____ How funny did you find this person to be?
12. _____ How warm did you find this person to be?
13. _____ How much would you like to be this individual's friend?
14. _____ Overall, how favorable did you find this person to be?
15. _____ How much do you think this person liked you?
APPENDIX I: TIME 2 RANKING

Please rank order the people that you just met, with one being individual that you thought was the most physically attractive overall and five being the individual that you thought was the least attractive overall.

1. __________________________
2. __________________________
3. __________________________
4. __________________________
5. __________________________

Please rank order the people that you just met, with one being individual that you thought was the most intelligent of all and five being the individual that you thought was the least intelligent overall.

1. __________________________
2. __________________________
3. __________________________
4. __________________________
5. __________________________
Please rank order the people that you just met, with one being individual that you thought had the **best social skills** overall five being the individual that you thought had the **worst social skills**.

1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________

Please rank order the people that you just met, with one being individual that you **liked the most** and five being the person that you **liked the least**.

1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________
APPENDIX J: PICTURE QUESTIONNAIRE

Participant A

Which picture is really Participant A? ______________

For the remaining questions, please use a scale of 0% to 100%.
0% is not at all likely
100% is certain

1. How likely is it that the 1st picture is the real picture of Participant A? ________%

2. How likely is it that the 2nd picture is the real picture of Participant A? ________%

3. How likely is it that the 3rd picture is the real picture of Participant A? ________%

4. How likely is it that the 4th picture is the real picture of Participant A? ________%

5. How likely is it that the 5th picture is the real picture of Participant A? ________%

6. How likely is it that the 6th picture is the real picture of Participant A? ________%

7. How likely is it that the 7th picture is the real picture of Participant A? ________%
APPENDIX K: MANIPULATION CHECK QUESTIONNAIRE

1. How did you feel today during the study?
   
   1. Rejected  2  3  4  5  6  7  8  9  10  11. Accepted
   
   (1) Neutral

2. How much do you agree with this statement:

   I felt like I was part of the group today.

   1. Strongly disagree  2  3  4  5  6  7  8  9  10  11. Strongly agree
   
   (1) Neither agree nor disagree

3. What is your age              ___________

4. What is your gender?

   Male    Female

5. What do you think the hypothesis of this study was? (If you don’t know, you can write down “Don’t know”.)
# Table 1

**Evaluations of Confederate (Study 1)**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ranking</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>2.39 (.19)_a</td>
<td>1.95 (.19)_b</td>
</tr>
<tr>
<td>Negative</td>
<td>2.33 (.19)_a</td>
<td>3.03 (.19)_c</td>
</tr>
<tr>
<td><strong>Impression (Intelligence, Physical Attractiveness, and Social Skills)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>8.18 (.21)_a</td>
<td>8.53 (.19)_b</td>
</tr>
<tr>
<td>Negative</td>
<td>8.12 (.20)_a</td>
<td>7.51 (.21)_c</td>
</tr>
<tr>
<td><strong>Overall Favorableness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>9.00 (.24)_a</td>
<td>9.21 (.21)_a</td>
</tr>
<tr>
<td>Negative</td>
<td>8.86 (.23)_a</td>
<td>7.69 (.20)_b</td>
</tr>
</tbody>
</table>

Note: Numbers with different subscripts differed significantly at the .05 level.

* Lower numbers indicate higher ranking (e.g. a ranking of 1 indicates the group member was ranked first).
Table 2

Evaluations of the Target (Study 2)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank-Order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>2.00 (.00)\textsubscript{a}</td>
<td>1.58 (0.73)\textsubscript{b}</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>4.00 (.00)\textsubscript{c}</td>
<td>3.04 (1.10)\textsubscript{d}</td>
</tr>
<tr>
<td>Negative Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>2.00 (.00)\textsubscript{a}</td>
<td>3.19 (1.06)\textsubscript{b}</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>4.00 (.00)\textsubscript{c}</td>
<td>4.16 (0.90)\textsubscript{c}</td>
</tr>
<tr>
<td>Graphic Rating Scale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>7.26 (3.06)\textsubscript{a}</td>
<td>7.85 (2.84)\textsubscript{a}</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>3.41 (3.17)\textsubscript{b}</td>
<td>5.10 (3.98)\textsubscript{c}</td>
</tr>
<tr>
<td>Negative Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>6.24 (2.49)\textsubscript{a}</td>
<td>3.29 (3.89)\textsubscript{b}</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>2.20 (2.52)\textsubscript{c}</td>
<td>1.86 (3.73)\textsubscript{c}</td>
</tr>
<tr>
<td>Impression (Intelligence, Physical Attractiveness, and Social Skills)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>8.89 (1.31)\textsubscript{a}</td>
<td>8.75 (1.43)\textsubscript{a}</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>7.51 (1.51)\textsubscript{c}</td>
<td>7.98 (1.30)\textsubscript{d}</td>
</tr>
</tbody>
</table>
Negative Feedback

<table>
<thead>
<tr>
<th></th>
<th>2\textsuperscript{nd} Ranked Group member</th>
<th>4\textsuperscript{th} Ranked Group member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>8.63 (1.37)&lt;sub&gt;a&lt;/sub&gt; 7.41 (1.55)&lt;sub&gt;b&lt;/sub&gt;</td>
<td>7.40 (1.10)&lt;sub&gt;c&lt;/sub&gt; 6.65 (1.41)&lt;sub&gt;d&lt;/sub&gt;</td>
</tr>
<tr>
<td>Negative</td>
<td>9.63 (1.25)&lt;sub&gt;a&lt;/sub&gt; 7.56 (1.91)&lt;sub&gt;b&lt;/sub&gt;</td>
<td>8.08 (1.41)&lt;sub&gt;c&lt;/sub&gt; 6.73 (1.51)&lt;sub&gt;d&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

Overall Favorableness

<table>
<thead>
<tr>
<th></th>
<th>2\textsuperscript{nd} Ranked Group member</th>
<th>4\textsuperscript{th} Ranked Group member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>9.40 (1.26)&lt;sub&gt;a&lt;/sub&gt; 9.40 (1.19)&lt;sub&gt;a&lt;/sub&gt;</td>
<td>8.63 (1.50)&lt;sub&gt;b&lt;/sub&gt; 8.74 (1.63)&lt;sub&gt;b&lt;/sub&gt;</td>
</tr>
<tr>
<td>Negative</td>
<td>9.63 (1.28)&lt;sub&gt;a&lt;/sub&gt; 7.56 (1.91)&lt;sub&gt;b&lt;/sub&gt;</td>
<td>8.08 (1.41)&lt;sub&gt;c&lt;/sub&gt; 6.73 (1.51)&lt;sub&gt;d&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

Note: Numbers with different subscripts differed significantly at the .05 level.

1: Lower numbers indicate higher ranking (e.g. a ranking of 1 indicates the group member was ranked first).

2: Higher numbers indicate greater attraction toward the source of the feedback.
Table 3

Between-subject analyses (Study 2)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Average rank-order</th>
<th>Average placement on the group</th>
<th>Average evaluation</th>
<th>Desire to be members friend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Feedback</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>2.13 (0.63)</td>
<td>6.53 (3.20)</td>
<td>8.73 (1.19)</td>
<td>9.26 (1.16)</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>3.02 (1.00)</td>
<td>4.56 (2.97)</td>
<td>8.31 (1.33)</td>
<td>8.48 (1.85)</td>
</tr>
<tr>
<td>Negative Feedback</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>3.04 (0.88)</td>
<td>4.14 (2.97)</td>
<td>7.49 (1.56)</td>
<td>6.81 (2.34)</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>3.56 (0.76)</td>
<td>3.32 (3.44)</td>
<td>6.81 (1.28)</td>
<td>6.23 (1.68)</td>
</tr>
</tbody>
</table>

\(^2\): Higher numbers indicate greater attraction toward the source of the feedback.
### Evaluations of the Target (Study 3)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rank-Order</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>2.00 (.00)\textsubscript{a}</td>
<td>1.40 (0.60)\textsubscript{b}</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>4.00 (.00)\textsubscript{c}</td>
<td>3.14 (1.06)\textsubscript{d}</td>
</tr>
<tr>
<td>Negative Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>2.00 (.00)\textsubscript{a}</td>
<td>3.15 (1.23)\textsubscript{b}</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>4.00 (.00)\textsubscript{c}</td>
<td>4.24 (0.94)\textsubscript{c}</td>
</tr>
<tr>
<td><strong>Impression (Intelligence, Physical Attractiveness, and Social Skills)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>8.64 (1.28)\textsubscript{a}</td>
<td>8.76 (1.11)\textsubscript{a}</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>7.68 (1.48)\textsubscript{c}</td>
<td>7.84 (1.26)\textsubscript{d}</td>
</tr>
<tr>
<td>Negative Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>8.62 (1.09)\textsubscript{a}</td>
<td>8.03 (1.08)\textsubscript{b}</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>7.62 (1.36)\textsubscript{c}</td>
<td>7.14 (1.40)\textsubscript{d}</td>
</tr>
<tr>
<td><strong>Overall Favorableness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} Ranked Group member</td>
<td>9.19 (1.21)\textsubscript{a}</td>
<td>9.24 (1.14)\textsubscript{a}</td>
</tr>
<tr>
<td>4\textsuperscript{th} Ranked Group member</td>
<td>8.05 (1.40)\textsubscript{b}</td>
<td>8.38 (1.50)\textsubscript{b}</td>
</tr>
</tbody>
</table>
**Negative Feedback**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2(^{nd}) Ranked Group member</td>
<td>9.14 (1.11)(_a)</td>
<td>7.90 (1.51)(_b)</td>
</tr>
<tr>
<td>4(^{th}) Ranked Group member</td>
<td>8.10 (1.51)(_c)</td>
<td>6.67 (1.98)(_d)</td>
</tr>
</tbody>
</table>

Note: Numbers with different subscripts differed significantly at the .05 level.

1: Lower numbers indicate higher ranking (e.g. a ranking of 1 indicates the group member was ranked first).

2: Higher numbers indicate greater attraction toward the source of the feedback.
Table 5

*Between-subject analyses (Study 3)*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Average rank-order(^1)</th>
<th>Average evaluation(^2)</th>
<th>Desire to be the group members friend</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive Feedback</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2(^{nd}) Ranked Group member</td>
<td>1.96 (0.76)</td>
<td>9.01 (1.14)</td>
<td>9.29 (1.52)</td>
</tr>
<tr>
<td>4(^{th}) Ranked Group member</td>
<td>3.29 (0.65)</td>
<td>8.47 (1.07)</td>
<td>8.00 (1.48)</td>
</tr>
<tr>
<td><strong>Negative Feedback</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2(^{nd}) Ranked Group member</td>
<td>2.93 (0.84)</td>
<td>7.70 (1.11)</td>
<td>7.24 (1.81)</td>
</tr>
<tr>
<td>4(^{th}) Ranked Group member</td>
<td>3.84 (0.76)</td>
<td>7.15 (1.34)</td>
<td>5.52 (2.22)</td>
</tr>
</tbody>
</table>

Note: Numbers with different subscripts differed significantly at the .05 level.

1:\ Lower numbers indicate higher ranking (e.g. a ranking of 1 indicates the group member was ranked first).
2:\ Higher numbers indicate greater attraction toward the source of the feedback.
### Table 6

**Evaluations of 2\textsuperscript{nd} Ranked Group Member (Study 4)**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ranking</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>2.00 (.00)\textsubscript{a}</td>
<td>1.74 (0.65)\textsubscript{b}</td>
</tr>
<tr>
<td>Negative</td>
<td>2.00 (.00)\textsubscript{a}</td>
<td>3.24 (1.03)\textsubscript{c}</td>
</tr>
<tr>
<td><strong>Impression (Intelligence, Physical Attractiveness, and Social Skills)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>8.35 (1.26)\textsubscript{a}</td>
<td>8.29 (1.15)\textsubscript{a}</td>
</tr>
<tr>
<td>Negative</td>
<td>8.13 (0.80)\textsubscript{a}</td>
<td>7.67 (0.97)\textsubscript{b}</td>
</tr>
<tr>
<td><strong>Overall Favorableness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>9.26 (1.41)\textsubscript{a}</td>
<td>8.84 (1.43)\textsubscript{a}</td>
</tr>
<tr>
<td>Negative</td>
<td>9.26 (1.05)\textsubscript{a}</td>
<td>7.89 (3.32)\textsubscript{b}</td>
</tr>
</tbody>
</table>

Note: Numbers with different subscripts differed significantly at the .05 level.

* Higher numbers indicate higher ranking (e.g. a ranking of 1 indicates the group member was ranked first).
Table 7

Evaluations of 2nd Ranked Group Member (Study 5)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ranking</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>2.00 (.00) a</td>
<td>1.77 (.60) b</td>
</tr>
<tr>
<td>Negative</td>
<td>2.00 (.00) a</td>
<td>3.28 (1.10) c</td>
</tr>
<tr>
<td><strong>Impression (Intelligence, Physical Attractiveness, and Social Skills)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>8.33 (1.23) a</td>
<td>8.28 (3.32) a</td>
</tr>
<tr>
<td>Negative</td>
<td>8.19 (1.43) a</td>
<td>7.24 (1.44) b</td>
</tr>
<tr>
<td><strong>Overall Favorableness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>9.25 (1.24) a</td>
<td>9.12 (1.24) a</td>
</tr>
<tr>
<td>Negative</td>
<td>9.12 (1.24) a</td>
<td>7.43 (1.70) b</td>
</tr>
</tbody>
</table>

Note: Numbers with different subscripts differed significantly at the .05 level.

* Higher numbers indicate higher ranking (e.g. a ranking of 1 indicates the group member was ranked first).