

# BALANCING MOTIVATIONS: SELF-ENHANCEMENT AND BELONGING

by

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(Under the Direction of Michelle R. vanDellen)

## ABSTRACT

The interpersonal nature of self-enhancement has often been restricted to partner-enhancement and basking in reflected glory, with very little work investigating the balance between needs for self-esteem and needs to belong. The current set of studies was designed to test the question how might self-enhancing and belonging maintenance processes function together or in opposition to one another? After discussing self-esteem and belonging as individual self-regulating systems, I propose that certain situations may influence the overlap between these two processes resulting in a tension that can predict behavior. As a first step in investigating this idea, I conducted two studies that placed the desire to feel positively about the self against the desire to belong and measured two different self-enhancement techniques (comparison, reflection)—one strategy representing a potential cost to belonging and one strategy that does not. Study 1 used a writing exercise to manipulate belonging status (inclusion, exclusion) and then assessed tendencies to self-enhance using comparison and reflection processes. There was no evidence to support the hypothesized interaction of belonging status and self-enhancement strategy. However, there was some evidence of individual difference variables influencing strategy preference. In Study 2, I manipulated the context of the

self-enhancement opportunity (private, public) to mimic situations of varying belonging costs and again assessed tendencies to compare and reflect. This time, there was support for the hypothesized context of self-enhancement opportunity by self-enhancement strategy interaction such that people asked to self-enhance in a relatively public context showed a preference for reflection over comparison. Results are discussed concerning when reflective self-enhancement might be perceived as beneficial and recommendations for future investigation in this area.

**INDEX WORDS:** self-enhancement, belonging, self-esteem, motivation

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## DEDICATION

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## CHAPTER 1

### INTRODUCTION

The desire to feel positively is sometimes considered a pervasive and dominant goal (Gaertner, Sedikides, & Chang, 2008; O'Mara, Gaertner, Sedikides, Zhou, & Liu, 2012; Sedikides, 1993; Sedikides, Gaertner, & Toguchi, 2003; Sedikides & Strube, 1995, 1997). To accomplish this goal people can engage in a variety of self-enhancing behaviors<sup>1</sup> to boost self-esteem. When people self-enhance they experience psychological benefits (e.g., increases in self-esteem, happiness, creativity, greater purpose in life, self-acceptance; Bonanno, Field, Kovacevic, & Kaltman, 2002; Taylor & Brown, 1988, 1994; Taylor, Lerner, Sherman, Sage, & McDowell, 2003a, 2003b). Further, both state and trait self-enhancement are positively associated with physical health benefits (e.g., longer lives, decreased stress response, fewer cardiac events, Bonanno et al., 2002; Bonanno, Rennie, & Dekel, 2005; Carver et al., 1993; Helgeson, 2003; Maruta, Colligan, Malinchoc, & Offord, 2000). Whereas some research has investigated disadvantages to self-enhancement (e.g., Colvin, Block, & Funder, 1995; Leary, Bednarski, Hammon, & Duncan, 1997; Van Damme, Hoorens, & Sedikides, 2016), the association with beneficial outcomes makes positive self-evaluations a higher order goal for most individuals. Nonetheless, wanting to have and maintain a positive view of self is not the only higher order goal people pursue. To name a few, people have goals for belonging (Baumeister & Leary, 1995; Leary, Tambor, Terdal, & Downs, 1995; Maslow, 1943; Ryan & Deci,

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<sup>1</sup> Some refer to self-enhancement as a motivation and others as a behavior. I will refer to the motivation as the desire to have a positive view of self and self-enhancement as the behaviors used in service of this goal.

2000a, 2000b, 2008), accuracy (Stone & Cooper, 2001; Swann, 1983, Trope & Ben-Yair, 1982; Trope & Pomerantz, 1998), and authenticity (Goldman & Kernis, 2002; Kernis & Goldman, 2005; Knee, Patrick, Vietor, Nanayakkara, & Neighbors, 2002; Ryan & Deci, 2000b; Swann, 1983).

Self-enhancing behaviors should be particularly useful when they make progress toward multiple goals or at the very least do not come at the expense of other important motivations (e.g., Kruglanski, Köpetz, Bélanger, Chun, Orehek, & Fishbach, 2013). For example, freely joining a softball team might afford autonomy and authenticity for someone who loves to be active and is a member of many sports leagues. On the other hand, freely trying a new art class might afford autonomy, but perhaps defeat competency goals when one realizes they are a terrible artist. Similarly, when earning a good exam grade it might make a student feel even better to tell others of this accomplishment, but that boastfulness could come at the expense of social goals. Keeping in mind the latter example, this manuscript will focus on the novel question: How might self-enhancing and belonging maintenance processes function together or in opposition to one another?

### **Self-Enhancement as an Esteem-Regulating Process**

Self-enhancement behaviors are enacted by a self-regulating esteem system. When one's state self-esteem varies too far from one's trait self-esteem the system engages in self-enhancing or self-effacing behaviors to up or down regulate esteem, respectively (Alicke & Sedikides, 2009; Tesser, Crepaz, Collins, Cornell, & Beach, 2000). For the purposes of this manuscript, I will focus on when and how people engage in self-enhancement to boost self-esteem. When a person experiences a deviation from their esteem baseline based on an external stimulus the self makes adjustments toward

reestablishing or surpassing that baseline (Alicke & Sedikides, 2009; Sedikides & Gregg, 2008). Similarly, a person can deviate above baseline when situations present opportunities for enhancement (Alicke & Sedikides, 2009); however, these gains may not last over time (e.g., Crocker & Park, 2004). Additionally, when opportunities for self-enhancement are thwarted, people often engage in other, compensatory behaviors to establish homeostasis in self-views (e.g., Bosson, Brown, Ziegler-Hill, & Swann, 2003; Jones, Pelham, & Mirenberg, 2002).

A broad way of distinguishing self-enhancing behaviors is as direct or indirect. Direct self-enhancement occurs when the agent of the behavior is also the target of the self-esteem boost (e.g., boasting about one's successes, reflecting on one's accomplishments). Indirect self-enhancement, on the other hand, is when the agent of the self-enhancement is someone other than the target (e.g., associating with successful others, reflecting on the positive aspects of one's partner). Whereas direct (vs. indirect) strategies result in a larger self-esteem boost (Brown, Collins, & Schmidt, 1988), direct behaviors may have more social costs (e.g., Paulhus, 1998).

Indirect strategies may not have as large of an effect on self-views, but they tend to be less interpersonally risky (Schütz & Tice, 1997). These strategies have largely been studied in the context of romantic partners (e.g., partner enhancement; Brown & Han, 2012) or at the institutional level (e.g., basking in reflected glory; Cialdini, Bordon, Thorn, Walker, Freeman, & Sloan, 1976; Cialdini & Richardson, 1980). People generally feel positively about their relationship partners (Gagné & Lydon, 2004), providing broad opportunities for self-enhancement by association. Furthermore, people who engage in partner-enhancement, boost their self-esteem by reflecting on the positive attributes of

their partner or associating with the partner's success (Brown & Han, 2012; El-Alayli & Wynne, 2015; Morry, Kito, & Dunphy, 2014; Schütz & Tice, 1997). Similarly, basking in reflected glory (BIRGing) involves associating with successful others (e.g., one's football team after a win, Cialdini et al., 1976). In both cases, the target of the enhancement allows someone else to be the agent of enhancement.

There is considerable variability in the extent to which people embrace various self-enhancement strategies (Brown et al., 1988; Campbell, Reeder, Sedikides, & Elliot, 2000; Campbell & Sedikides, 1999; Hepper, Gramzow, & Sedikides, 2010; Lynch & O'Mara, 2015; Sedikides, Campbell, Reeder & Elliot, 1998). For instance, endorsement of some strategies is more likely in collectivist cultures than in individualistic cultures (Cai et al., 2011; Kurman, 2003, Kurman & Sriram, 2002). Additionally, people with lower (vs. higher) self-esteem are less likely to engage in direct or self-promotional strategies (Brown et al., 1988; Horvath & Morf, 2010; Raskin, Novacek, & Hogan, 1991; vanDellen, Campbell, Hoyle, & Bradfield, 2011, Wood, Giordano-Beech, Taylor, Michela, & Gaus, 1994). People higher in narcissism are more willing to engage in self-serving biases that are both comparative (e.g., blame another individual) and non-comparative (e.g., blame situational factors); non-narcissists, however, engage in non-comparative (vs. comparative) self-serving enhancement (Campbell, Reeder et al., 2000). Even for people with no strong preference for or against specific strategies, self-enhancement strategies are interchangeable (e.g., swapping social comparison in favor of self-handicapping; Tesser, 2000).

Situational factors may also influence strategy selection. For example, the presence or absence of others influences self-enhancement—privately reminding the self

of past successes should carry less interpersonal risk than boasting to one's team that your buzzer beater shot is the reason your team won the game. The plethora of research surrounding self-serving biases and attributions suggests people engage in self-enhancing behaviors and cognitions in response to threat (e.g., failure; Campbell & Sedikides, 1999). When experiencing success, one attributes the outcome to personal or internal attributes, but when experiencing failure, one attributes the outcome to others or external factors (Blaine & Crocker, 1993; Campbell & Sedikides, 1999; Forsyth, 2008).

### **Belonging as a Self-Regulating Process**

In addition to self-esteem maintenance, people need to feel a sense of belonging to important groups and to have meaningful relationships (Baumeister & Leary, 1995; Crocker & Park, 2004; Leary et al., 1995; Maslow, 1943; Ryan & Deci, 2000a, 2000b, 2008). The need to belong is similarly controlled by a self-regulating process. When belonging needs are threatened, people change their behaviors to earn the acceptance of social groups perceived as important (DeWall, Baumeister, Gailliot, & Maner, 2008; Lakin, Chartrand, & Arkin, 2008; Leary, 2004). Although the group to which one feels a sense of belonging can fluctuate (Brewer, 1991, 1993; Brewer & Gardner, 1996; Palmonari, Pombeni, & Kirchler, 1989), this fluctuation serves primarily to ensure people can find a sense of belonging. Similarly, when the need to belong is satisfied the motivational drive to belong should decrease (Baumeister & Leary, 1995).

Whether social exclusion is perceived as real (e.g., cyberball, not being chosen as a partner) or imagined (e.g., thinking of a future alone) it has very real negative implications for the excluded party. Exclusion leads to decreases in self-control (Baumeister, DeWall, Ciarocco, & Twenge, 2005) and cognitive performance (e.g., IQ



and GRE scores; Baumeister, Twenge, & Nuss, 2002) and increases in self-defeating behaviors including taking irrational risks and procrastination (Twenge, Catanese, & Baumeister, 2002). Excluded people are also significantly less likely to engage in a host of prosocial behaviors (e.g., donations, volunteering, cooperation; Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007). Not only are excluded people less likely to help others they are actually more likely to behave aggressively toward others, even if the other was not the impetus for exclusion (Twenge, Baumeister, Tice, & Stucke, 2001).

Fortunately, the self-regulating nature of the belonging process shifts attention to information that helps people overcome the negative experience of exclusion and behave in ways that attempt to regain ingroup status. When the situation induces a need to belong (exclusion) people pay greater attention to social cues (vocal tone; Pickett, Gardner, & Knowles, 2004, Study 2) and exhibit greater memory for social information (Gardner, Pickett, & Brewer, 2000). Gardner and colleagues (2000) also note an unpublished thesis by Ko (1994) who found that after exclusion participants increase their use of the word “we” in future discussions. This greater attention to social cues is also found at the trait level: those chronically experiencing the need to belong are more accurate at assessing both the vocal tones and facial expressions of others (Pickett et al., 2004).

Belonging needs are so pervasive that meeting them often comes naturally (Baumeister & Leary, 1995). For instance, people who have been excluded (vs. included) are more likely to automatically mimic other group members (vs. people from another group) because of a desire to be reinstated in the group (Lakin et al., 2008). Furthermore, in large groups, cooperation behaviors (e.g., contributions to public goods) can be used to satisfy belonging needs (De Cremer & Leonardelli, 2003). That being said, the best way

to satisfy the need to belong is by creating and fostering meaningful relationships with people you care about (Baumeister & Leary, 1995).

### **Competing Motivations**

On the surface, self-enhancement appears to involve prioritizing the self as a single unit whereas belonging involves the self as part of a larger system that necessarily takes into account other's views of self. This superficial difference has lead researchers largely to study these self-regulating processes independently (cf. Rudich & Vallacher, 1999). Although the work on partner-enhancement (Brown & Han, 2012) or basking in reflected glory (Cialdini et al., 1976; Cialdini & Richardson, 1980) discuss interpersonal processes they do not actually assess belonging motivation or needs. I propose that researchers are missing an important possibility and cue to behavior: these self-regulating processes will collide with one another at some point. Although it has not been discussed in this way there is some evidence to suggest that this collision occurs. Research focused on self-enhancement often finds that prioritizing self-enhancement comes at the expense of relationships and others' views of self. For example, self-promoters are not always well-liked (Leary et al., 1997; Van Damme et al., 2016): whereas self-enhancers may make good first impressions (e.g., Taylor & Brown, 1988) these impressions often dissolve into beliefs that the self-enhancers are deceitful, distrustful, defensive, and narcissistic (Colvin et al., 1995; Paulhus, 1998).

Just as self-esteem needs can interfere with belonging, so too can social needs interfere with the self. Whereas compliance may establish one's group membership and at times can boost self-esteem (Cialdini & Goldstein, 2004), compliance is also negatively associated with self-esteem and positively associated with poor coping skills

(e.g., denial and behavioral disengagement; Gudjonsson & Sigurdsson, 2003). For example, people who want to be a part of a group they perceive as important suffer decreased self-esteem if they find out the group holds opinions contrary to their own (Pool, Wood, & Leck, 1998). People even initiate behaviors that are bad for the self (e.g., eating unhealthy) if that behavior leads to social acceptance (e.g. at a party; Rawn & Vohs, 2011).

I suggest when needs for esteem and belonging compete, the strategies individuals choose are based on which motivation they are prioritizing and the extent to which they recognize the conflict between motivations. For example, a person who prioritizes self-esteem (or is in a situation in which belonging is perceived as irrelevant) may boast about his own successes or force undue blame onto others in the face of failure—preferring strategies that offer a greater potential to quickly feel more positively about the self (Brown et al., 1988; Campbell & Sedikides, 1999; Vohs & Heatherton, 2004). Similarly, someone prioritizing belonging (or who finds himself in a situation that magnifies the potential cost to belonging) may instead highlight his connection to a group and simultaneously experience a positive sense of self by associating with successful others (Baumeister & Leary, 1995; Cialdini et al., 1976; Snyder, Lassegard, & Ford, 1986). When people share in their close others' accomplishments (e.g., Brown & Han, 2012) they may likewise experience more belonging (Gable & Reis, 2010). In self-enhancement research, the design often restricts the situation as well as possible responses from participants and does so in a way that makes self-enhancement not only feasible but also the preferred response (Trope, 1986). When research pits esteem goals vs. belonging goals the participant is often constrained to very specific types of self-enhancement (for a

discussion of, and exception to, this issue see Campbell, Sedikides, Reeder, & Elliot, 2000 and Campbell, Reeder et al., 2000).

### **Testing Motivational Competition**

An existing model and methodological paradigm in research on the self lends itself well as a test for how individuals prioritize the competition between esteem boosting and belonging maintenance processes. The self-evaluation maintenance model (SEM; Tesser, 1985) is that model. SEM posits three variables that interact to predict boosts or threats to self-evaluation: (1) the closeness between self and other, (2) the extent to which the other performs well (or poorly), and (3) the relevance of the performance dimension to identity (Tesser, 1985; Tesser, Millar & Moore, 1988; Tesser & Moore, 1998). In terms of my argument, the first variable captures belonging processes while the second and third capture self-esteem processes.

According to SEM, the possible self-evaluation maintenance enacted by these variables can take the form of comparison or reflection. When a friend performs well in a relevant domain, self-evaluation can take a hit through upward comparison processes in which the person feels they do not measure up to the friend. Alternatively, when a friend performs well in a non-relevant domain the self engages in a reflection process and is able to bask in his or her association with the friend. In the context of a stranger, SEM suggests the reflection and comparison processes are attenuated because good performance is less threatening and more difficult to reflect on and poor performance is not likely to result in reflection nor is the comparison process likely to decrease self-evaluations. In essence, SEM suggests that relevance of the domain moderates the association between closeness and self-evaluation processes (Tesser, 1985, Tesser et al.,

1988; Tesser & Moore, 1998). Research on SEM, however, does not measure tendencies to reflect or compare as independent constructs. Instead, they are operationalized the same way (e.g., positive affect; Tesser et al., 1988) but interpreted differently based on context. For example, the positive affect one feels when outperformed by a friend on a domain of low relevance is believed to represent reflection (basking in reflected glory); whereas, the lack of positive affect experienced when outperformed by a close other on a domain of high relevance is believed to represent falling short when comparing the self to the high-performing other. Rather than interpreting presence or absence of affect as indicative of different self-evaluating processes, I plan to measure comparison and reflection more directly and manipulate the situations and prioritization of motivations to influence which self process is preferred.

### **Present Studies**

I suggest that the competition between the desires for self-esteem and belonging results in a tension that predicts the type of self-enhancement in which a person will engage. In the current work, I examined situations in which people were presented with opportunities to engage with both their self-esteem maintenance and belonging goals simultaneously. First, by experimentally manipulating belonging status (inclusion, exclusion), I tested if the salience of belonging needs differentially predicts self-enhancement strategy. I hypothesized a main effect of belonging status such that excluded participants engage in both types of self-enhancement more than included participants. However, the effect of interest was an expected interaction between belonging status and strategy preference such that people who recall being excluded (relative to included) would show a stronger preference for reflection over comparison

(Hypothesis 1 [H1]). I had no specific hypothesis for the simple effect of inclusion on preference because I believe participants could either exhibit no difference in strategy preference or perhaps prefer comparison because there is not a threat to belonging.

In Study 2, I experimentally manipulated the context of the self-enhancement opportunity such that one option allows for a greater self-esteem boost but may harm belonging (public self-enhancement) and the other option presents an opportunity for a smaller boost but has less or no cost to belonging (private self-enhancement). I hypothesized an interaction between the context of the self-enhancement opportunity (public, private) and strategy preference such that people who are asked to publicly self-enhance would show a greater preference for reflection over comparison (Hypothesis 2 [H2]). Again, I had no specific hypothesis for the simple effect of private self-enhancement on preference because I believe participants could either exhibit no difference in strategy preference or perhaps prefer comparison because the threat to belonging is minimal or not present.

In both studies I also investigated an exploratory question in regard to the measure of reflection. As previously discussed, I believe that reflection is a combination of viewing the target as having positive qualities to a greater extent than most other people *and* feelings of closeness between the self and the target. However, I was curious how these two aspects would work together to form the single reflection construct. Averaging the two factors together would allow each piece of the construct equal weight in determining someone's tendency to reflect. It is, however, possible that the two factors amplify each other in order to create reflection: perhaps one's perceptions of another's positive qualities depend on the extent of the closeness between them. In this case, a

multiplicative variable would be more appropriate – for each additional unit of closeness, positive attributes would increase by 100%. Therefore, to better understand the reflection construct and to make recommendations for future research, I ran all analyses twice – one for each conceptualization of the reflection variable (i.e., average, multiplicative).

## CHAPTER 2

### STUDY 1

Study 1 was designed to test H1: self-enhancement strategy preference will be moderated by belonging status. Manipulating the salience of the need to belong should differentially predict self-enhancement strategy such that people who recall being excluded (relative to included) should show a stronger preference for reflection over comparison (H1). Study 1 utilized an experimental, mixed design with belonging status (inclusion, exclusion) treated as a between-subject variable and enhancement strategy (comparison, reflection) as a within subject variable.

#### **Method**

**Participants.** Two-hundred and four undergraduate students self-selected to participate through the SONA experimental management system in exchange for course credit. One person failed to write an essay for the belonging status manipulation so their data was removed prior to analyses. Individual difference measures were assessed prior to coming to the lab. Participants were asked to create a unique ID to merge data from the online session and the lab session. I was able to link the IDs for 189 participants. Thus, for my primary hypotheses there are 203 people included, but for moderation by individual differences there are only 189 cases. Demographics were only collected online. Therefore, for the 189 full cases, participants ( $M_{age} = 18.74$ ;  $SD_{age} = 1.32$ ) identified mostly as women ( $n_{women} = 165$ ,  $n_{men} = 22$ ,  $n_{other} = 2$ ) and as white (79.1%,



12.43% Asian, 6.21% Black or African American, 0.56% American Indian or Alaska Native, and 1.69% other).

**Procedures.** Participants completed Time 1 measures of individual differences online<sup>2</sup> (see Appendix A). Time 2 occurred in the lab. During the lab session, first participants named a friend for reference later in the study. In order to make the desire to self-enhance relevant, all participants completed a difficult version of the Remote Associates Task (RAT; Mednick, 1962) designed to induce feelings of failure (McFarlin & Blascovich, 1984; items and full instructions in Appendix B). All participants were told, “High scores on the task are related to creativity and cognitive ability. Therefore, correct responses to more difficult questions will gain more points.” Participants were given two practice trials before moving onto the 12-set task. Participants had to spend a minimum of five minutes working on the task. When they finished, all participants were given the same failure feedback (i.e., they received 25% of the possible points and scored in the 54<sup>th</sup> percentile). Additionally, I manipulated belonging status by randomly assigning half of the participants to write about a time when they felt excluded and the other half about a time they felt included (see Appendix B for full instructions). Because of the sensitivity of these two threats I randomized the presentation of these tasks across participants. After completing the two tasks, participants completed measures designed to test comparison and reflection processes (in a random order).

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<sup>2</sup> I expected small to medium effect sizes. Therefore, to minimize demand characteristics and in an effort not to cloud my manipulation individual difference measures were assessed at an earlier time.

**Online measures.** Individual difference measures<sup>3</sup> were completed online (in a random order) prior to completing the other study relevant tasks in the lab. (Full measures in Appendix A.) Descriptive statistics and Cronbach's  $\alpha$  for each measure are presented in Table 1.

**Self-esteem.** The 10-item Rosenberg self-esteem scale (Rosenberg, 1979) was used to assess trait self-esteem. Participants indicated agreement with each item (e.g., "I feel I am a person of worth") on a five-point Likert scale (1 = *not at all like me*, 5 = *very much like me*). Items were reverse scored as needed so that higher scores indicated greater self-esteem, and then items were averaged to get a single self-esteem score.

**Narcissism.** To measure narcissism, I used the Brief Narcissistic Personality Inventory (NPI-13; Gentile, Miller, Hoffman, Reidy, Zeichner, & Campbell, 2013). Participants viewed pairs of statements and indicated the statement with which they most agreed (e.g., A. "I find it easy to manipulate people" or B. "I don't like it when I find myself manipulating people"). Items were scored and summed such that higher scores indicated greater narcissism.

**Humility.** The seven item Humility Scale (Powers, Nam, Rowatt, & Hill, 2007) was used to measure humility. Participants viewed seven trait pairs on opposite ends of a seven-point scale. Participants indicated where on the scale they fell between the two traits (e.g., arrogant to humble, immodest to modest). Items were averaged to get a single humility score.

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<sup>3</sup> For use in another study, I also assessed self-control using the Brief Self-Control Scale (Tangney, Baumeister, & Boone, 2004) and the five-factor model of personality using the Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003).

Table 1.

*Descriptive Information and Internal Consistency of Study 1 and Study 2 Measures*

	<b>Study 1</b>		<b>Study 2</b>	
<b>Online Measures</b>	$\alpha$	<i>M(SD)</i>	$\alpha$	<i>M(SD)</i>
<i>Self-esteem</i>	0.90	3.70(0.81)	0.91	3.77(0.82)
<i>Narcissism</i>	0.64	3.88(2.54)	0.67	3.96(2.57)
<i>Humility</i>	0.74	5.39(0.81)	0.62	5.30(0.68)
<i>Ability Social Comparison</i>	0.80	3.48(0.75)	0.80	3.39(0.74)
<i>Opinion Social Comparison</i>	0.72	3.93(0.63)	0.58	3.92(0.51)
<i>Need to Belong</i>	0.84	3.36(0.67)	0.85	3.23(0.71)
<b>Lab Measures</b>	$\alpha$	<i>M(SD)</i>	$\alpha$	<i>M(SD)</i>
<i>Comparison</i>	0.53	51.47(9.50)	0.66	5.82(0.85)
<i>Reflection</i>				
Friend-other Comparison	0.69	66.19(11.5)	0.82	8.29(1.17)
Closeness	0.82	5.83(0.96)	0.69	4.90(0.61)

*Note.* In both studies self-esteem, ability and opinion social comparison orientations, and the need to belong were on 1-5 scales. Humility was on a 1-7 scale. Narcissism was summed so scores could range from 0-13. Comparison was on a 100 point slider scale in Study 1 and an 11 point scale in Study 2. Reflection was made up of a friend-other comparison answered on a 100 point slider scale in Study 1 and an 11 point scale in Study 2 and closeness on a 1-7scale in both studies. Reflection composites are explained in text.

***Social comparison orientation.*** As a potential moderator I used the Iowa-Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999) to assess trait-like tendencies to engage in particular types of comparison. Participants indicated their agreement (1 = *disagree strongly* to 5 = *agree strongly*) with 11 items. These items assess two factors of social comparison: ability (e.g., “I often compare my loved ones [boy or girlfriend, family members, etc.] with how others are doing”) and opinions (e.g., “I often like to talk with others about mutual opinions and experiences”). Items were reverse scored as needed and then each factor was created by averaging the responses to items on that factor. Each participant, thus, has an ability orientation score and an opinion orientation score,  $r(188) = .34, p < .0001$ .

***Need to belong.*** I also assessed trait-like sensitivity to the need to belong using the Need to Belong Scale (Leary, Kelly, Cottrell, & Schreindorfer, 2013). Participants indicated the degree to which each statement was true of them (1 = *not at all* to 5 = *extremely*) with 10 items (e.g., “I try hard not to do things that will make other people avoid or reject me”). As needed, items were reverse scored so that higher scores indicated a higher need to belong. All items were then averaged to get a single need to belong score for each participant.

**Lab measures and manipulations.** The following manipulations and dependent variable assessments were given in the lab portion of the study. (Full measures and instructions are in Appendix B.) Descriptive statistics and Cronbach’s  $\alpha$  for each measure are presented in Table 1.

***Remote associates task (RAT).*** The original RAT (designed to test creativity) consisted of 30 sets of three related words (Mednick, 1962). Participants examined the

three words, determined how they were related and generated a fourth word to capture the relationship (e.g., “elephant,” “lapse,” and “vivid” a correct response would be “memory”). McFarlin and Blascovich (1984) determined 10, word sets were particularly difficult and could be used to induce feelings of failure and 10, word sets were particularly easy. In order to induce failure, I used nine difficult word sets, but I also included three of the easy word sets to increase the believability of the task. Participants were not allowed to advance prior to spending five minutes on the task ( $M_{time} = 7.47$  minutes;  $SD_{time} = 2.01$  minutes). These 12, word sets were used in Study 1 and Study 2.

***Belonging writing task.*** Participants were asked to spend about five minutes ( $M_{time} = 3.77$  minutes;  $SD_{time} = 1.13$  minutes) writing about a time they were either included or excluded.

***Comparison.*** Based on items and procedures previously used to assess social comparison (Allan & Gilbert, 1995; Brown & Han, 2012; Taylor & Gollwitzer, 1995) I created a 10-item measure to capture comparison. Participants rated themselves relative to their friend on a variety of characteristics (e.g., “less competent, more competent,” “less attractive, more attractive”) using 100-point slider scales and an average was created.

***Reflection.*** Conceptually, reflection is both one’s belief that someone is successful and one’s relationship to that person. Therefore, I assessed reflection through a composite of friend-other comparison and closeness to friend.

***Friend-other comparison.*** Participants completed the same 10-item comparison measure described above. This time, however, participants compared their friend to most

other people. These items were averaged to get a friend-other comparison score to use in the composite.

*Closeness.* Closeness was assessed with items used in previous work (Fitzsimons & Fishbach, 2010). Participants indicated the degree to which they feel close to their friend on 5 items (e.g., “How positively do you feel about you friend?” 1 = *not at all positive* to 7 = *extremely positive*). These items also included an adaptation of Inclusion of Other in Self presented with seven options (Aron, Aron, & Smollan, 1992). These six items were scored such that higher scores indicated greater closeness and were averaged to form a closeness score to use in the composite.

*Creating the composite variables.* Because friend-other comparison was scored on a 100 point slider and closeness was scored on a seven-point Likert scale, both factors were standardized before creating any of the composites ( $r[204] = 0.36, p < .0001$ ). The composites were created by (1) averaging the friend-other comparison score with the closeness score ( $M = 0.00, SD = 0.82$ ), and (2) multiplying the friend-other comparisons by the closeness score ( $M = 0.35, SD = 1.09$ ). Because creating the composite changed the scaling of the reflection construct I re-standardized the composites before running analyses.

To better understand how the two self-enhancement strategies may be related, I also examined the correlation between each reflection composite and comparison. Comparison was marginally negatively associated with reflection when treated as a mean ( $r[204] = -0.13, p = .06$ ), but was unrelated to reflection when treated as a multiplicative composite ( $r[204] = 0.01, p = .89$ ).

## Results

**Analysis plan.** To test H1 (self-enhancement strategy preference will be moderated by belonging status), I used a repeated measures ANOVA (in SAS 9.4) in which enhancement strategies (reflection, comparison) were treated as within person and belonging status condition (inclusion, exclusion) was treated as a between factor. All of the reflection composites and the comparison variable were standardized so that the within person variables would be on the same scale. To investigate individual difference moderation, all individual difference variables were standardized and significant interactions were decomposed at one standard deviation above and below the mean (Cohen, Cohen, West, & Aiken, 2003) using the proc mixed function in SAS 9.4.

**Hypothesis 1.** Regardless of reflection composite used, there were no significant interactions between belonging status condition and enhancement strategy, nor were any of the main effects of condition nor enhancement strategy significant. Thus, I found no support for Hypothesis 1. All results of these analyses, including partial eta square values can be found in Table 2.

**Individual difference variables.** I had no specific hypotheses regarding individual differences. However, I assessed variables previously shown to be related to self-enhancement (self-esteem, narcissism, and humility) and theoretically related to my constructs of interest (social comparison orientation and the need to belong). I investigated the extent to which my hypothesized interaction was moderated by individual differences. All individual difference variables were standardized prior to analyses. Results of individual difference moderation analyses for Study 1 are presented in Table 3.

Table 2.

*Study 1, Hypothesis 1: Main Effects and Interactions Associated with Belonging Status Condition for each Reflection Composite*

<b>Reflection Composite</b>	<b>Main Effect of Condition (between)</b>	<b>Main Effect of Enhancement Strategy (within)</b>	<b>Interaction Between Condition and Enhancement Strategy</b>
Averaged	$F(1,202) = 0.38$ $p = .54, \eta^2 = 0.002$	$F(1,202) = 0.00$ , $p = .998$	$F(1,202) = 0.03$ , $p = .87, \eta^2 = 0.0001$
Multiplicative	$F(1,202) = 0.31$ , $p = .58, \eta^2 = 0.002$	$F(1,202) = 0.00$ , $p = .998$	$F(1,202) = 0.02$ , $p = .90, \eta^2 = 0.0001$

*Note.*  $\eta^2$  represents the partial eta square for each effect. Partial eta was calculated to account for the fact that enhancement strategy is a within person variable.



Table 3.

*Study 1, Main effects and Interactions Associated with Potential Individual Difference Moderators.*

		Main Effect Trait	Main Effect of Condition	Interaction Between Trait and Condition	Main Effect of Enhancement Strategy	Interaction Between Enhancement and Condition	Interaction Between Enhancement and Trait	Interaction between Enhancement, Trait, and Condition
Trait	Reflection Composite	F ( $\eta^2$ )	F ( $\eta^2$ )	F ( $\eta^2$ )	F ( $\eta^2$ )	F ( $\eta^2$ )	F ( $\eta^2$ )	F ( $\eta^2$ )
Self-Esteem	Averaged	23.57**** (0.11)	1.99 (0.01)	1.14 (0.01)	0.00	0.01 (0.001)	0.18 (0.001)	1.35 (0.01)
	Multiplicative	4.93* (0.03)	0.89 (0.004)	0.17 (0.001)	0.00	0.07 (0.0004)	3.78 ** (0.02)	0.02 (0.0001)
Narcissism	Averaged	12.37*** (0.06)	1.09 (0.01)	0.06 (0.0003)	0.03 (0.0001)	0.00	3.83 ** (0.02)	0.92 (0.005)
	Multiplicative	4.48* (0.02)	0.53 (0.002)	0.20 (0.001)	0.01 (0.0001)	0.00	8.46** (0.04)	0.22 (0.001)
Humility	Averaged	11.17*** (0.06)	1.41 (0.01)	1.17 (0.01)	0.00	0.00	0.45 (0.002)	0.01 (0.00004)
	Multiplicative	0.06 (0.0004)	0.68 (0.004)	0.19 (0.001)	0.00	0.03 (0.0002)	2.36 (0.01)	0.09 (0.0004)
Ability Orientation	Averaged	11.44*** (0.06)	0.94 (0.01)	0.13 (0.001)	0.02 (0.0001)	0.00	2.73 * (0.01)	0.70 (0.004)
	Multiplicative	10.00** (0.05)	0.51 (0.003)	0.13 (0.001)	0.00	0.00	2.12 (0.01)	0.78 (0.004)
Opinion Orientation	Averaged	0.18 (0.001)	1.14 (0.01)	0.30 (0.002)	0.05 (0.0003)	0.00	1.57 (0.01)	1.31 (0.01)
	Multiplicative	1.21 (0.01)	0.53 (0.003)	0.33 (0.002)	0.00	0.00	0.48 (0.003)	0.10 (0.001)
Need to Belong	Averaged	0.02 (0.0001)	1.27 (0.01)	0.39 (0.002)	0.00	0.01 (0.0001)	4.55* (0.02)	0.05 (0.0003)
	Multiplicative	0.35 (0.002)	0.60 (0.003)	0.17 (0.001)	0.00	0.00	3.89* (0.02)	0.03 (0.0002)

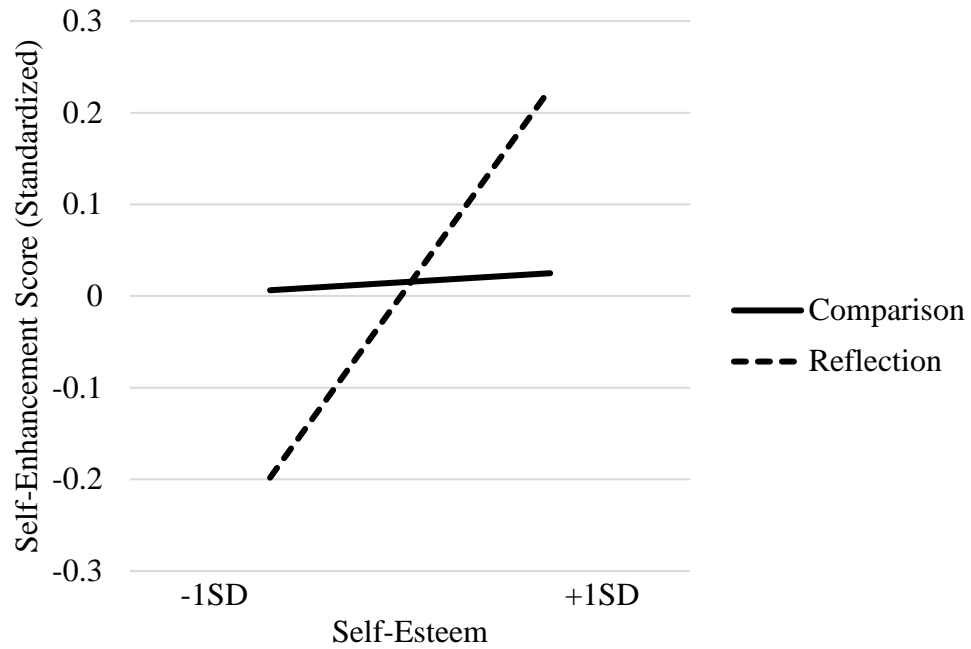
\* $p < .10$ , \*\* $p \leq .06$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , \*\*\*\* $p < .0001$

Note. For analyses involving self-esteem, narcissism, and humility, all degrees of freedom are 1, 185. For analyses involving ability social comparison orientation, opinion social comparison orientation, and need to belong, all degrees of freedom are 1, 184.

$\eta^2$  represents the partial eta square for each effect. Partial eta was calculated to account for the fact that enhancement strategy is a within person variable.

**Self-esteem.** To test the moderating role of self-esteem on enhancement preference, I used a repeated measures ANOVA in which condition and self-esteem were treated as between-subjects variables and self-enhancement strategy was within-subject. Regardless of reflection composite used, the three-way interaction between enhancement strategy, self-esteem, and condition was never significant ( $ps > .25$ ; see Table 3). Nevertheless, in both cases there was a main effect of self-esteem. Additionally, when the multiplicative reflection construct was used there was a marginally significant enhancement strategy by self-esteem interaction ( $F[1,185] = 3.78, p = .053, \eta^2 = 0.02$ ). Therefore, I ran simpler mixed models (proc mixed, SAS 9.4) in order to examine these lower level effects. For the averaged reflection composite model, the main effect of self-esteem was such that higher self-esteem was associated with more self-enhancing overall,  $b = 0.19, SE = 0.04, t(187) = 4.84, p < .0001, 95\% CI (0.11, 0.27)$ . For the multiplicative reflection composite model, Figure 1 shows the marginally significant self-esteem by self-enhancement strategy interaction,  $F(1,187) = 3.77, p = .053$ . Decomposing this interaction suggests that the only significant simple effect is the effect of self-esteem at reflection,  $b = 0.21, SE = 0.07, t(187) = 2.90, p = .004, 95\% CI (0.07, 0.36)$ : as self-esteem increases so does the tendency to use reflection as a self-enhancement strategy; suggesting that the relationship between self-esteem and the tendency to reflect is stronger than that between self-esteem and comparison.

**Narcissism.** To test the moderating role of narcissism on enhancement strategy preference, I used a repeated measures ANOVA in which condition and narcissism were treated as between-subjects variables and self-enhancement strategy was within-subject.



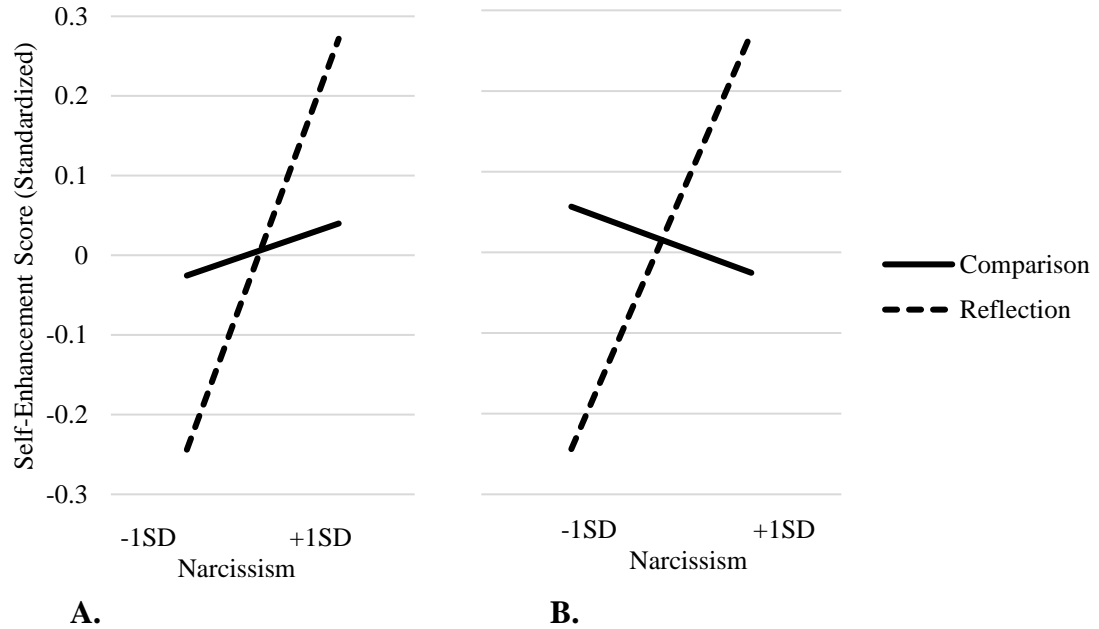
*Figure 1.* The self-esteem by enhancement strategy interaction using the multiplicative reflection composite, Study 1.

Regardless of reflection composite used, the three-way interaction between enhancement strategy, narcissism, and condition was never significant (both  $ps > .34$ ; see Table 3). However, in both cases the two-way interaction of enhancement by narcissism, as well as the effect of narcissism were significant. Running a mixed model to test the two-way interaction of narcissism by enhancement strategy when the reflection composite was averaged produced a marginally significant interaction,  $F(1,187) = 3.53, p = .06$ . As shown in Figure 2a, narcissism always produced more enhancement ( $F[1,187] = 13.06, p < .001$ ). However, decomposing the interaction both ways showed that the only significant simple effect was that of narcissism for reflection – similar to self-esteem, as narcissism increased so did the tendency to reflect,  $b = 0.26, SE = 0.07, t(187) = 3.57, p < .001, 95\%CI (0.12,0.40)$ ; suggesting that the relationship between narcissism and the tendency to reflect is stronger than that between narcissism and comparison. Treating reflection as a multiplicative composite produced a similar, significant narcissism by enhancement interaction,  $F(1,187) = 8.38, p = .004$ . As Figure 2b shows, narcissism was positively associated with self-enhancing overall,  $F(1,187) = 4.51, p = .04$ . As with the averaged composite, the simple effect of narcissism at reflection was significant,  $b = 0.26, SE = .07, t(187) = 3.55, p < .001, 95\%CI (0.11, 0.40)$ . Additionally, people lower in narcissism reflected significantly *less* than compared<sup>4</sup> and people higher in narcissism reflected significantly *more* than compared.<sup>5</sup>

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<sup>4</sup>  $b = 0.30, SE = 0.15, t(187) = 2.06, p = .04, 95\%CI (0.01,0.59)$

<sup>5</sup>  $b = -0.29, SE = 0.15, t(187) = -2.04, p = .04, 95\%CI (-0.58,-0.01)$



*Figure 2.* The narcissism by enhancement strategy interaction, Study 1. Panel A shows the interaction using the averaged reflection composite. Panel B shows the interaction using the multiplicative reflection composite.

**Humility.** I tested humility as a moderator in the same way as self-esteem and narcissism. Regardless of reflection composite used, none of the three-way interactions between enhancement strategy, condition, and humility were significant, nor were any of the lower order interactions (see Table 3). However, the effect of humility was significant using the averaged reflection composite. Therefore, I ran a simpler mixed model to test this main effect: humility was positively related to self-enhancement,  $b = 0.13$ ,  $SE = 0.04$ ,  $t(187) = 3.18$ ,  $p = .002$ , 95%CI (0.05, 0.21); people higher (vs. lower) in humility self-enhanced more overall.

**Social comparison orientations.** I tested each social comparison orientation (ability, opinion) as a moderator in the same way as the previous individual differences. The only effect to emerge from these analyses was a main effect of ability orientation on strategy preference for both reflection composites (see Table 3). Thus, I ran simpler mixed models to examine these effects. In both cases, an ability social comparison orientation was negatively associated with self-enhancement overall (additive:  $b = -0.14$ ,  $SE = 0.04$ ,  $t[186] = -3.56$ ,  $p < .001$ , 95%CI [-0.22,-0.06]; multiplicative:  $b = -0.17$ ,  $SE = 0.05$ ,  $t[186] = -3.32$ ,  $p = .0011$ , 95%CI [-0.27,-0.07]). People with a greater tendency to socially compare in the ability domain were less likely to self-enhance using my two constructs.

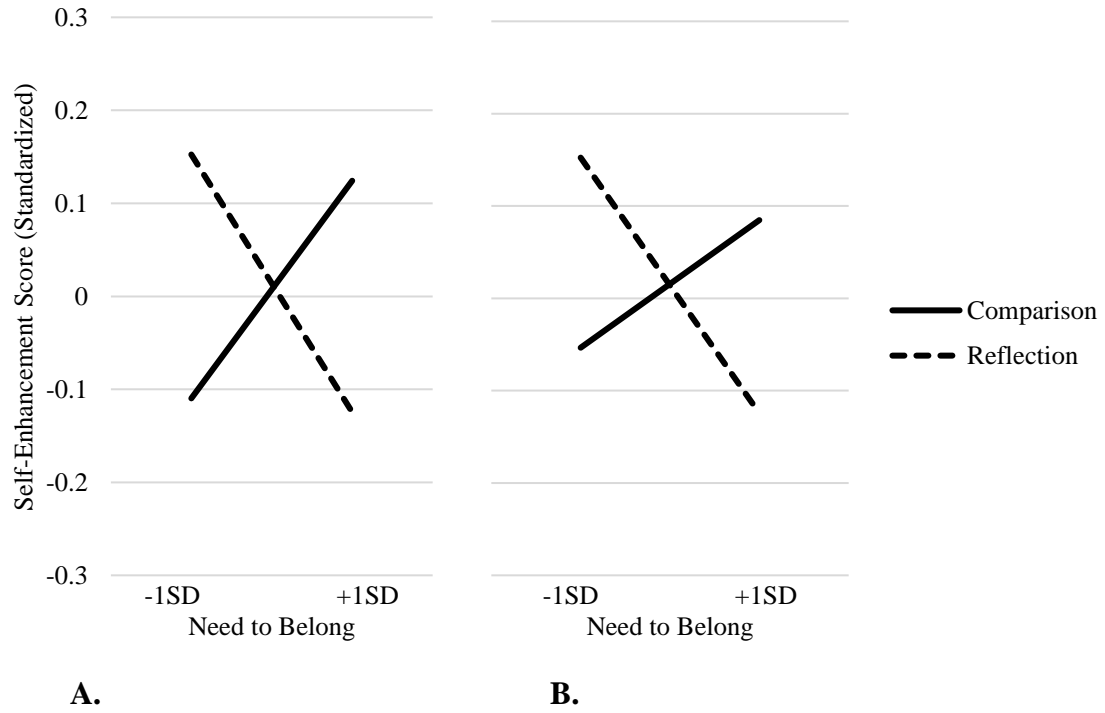
**Need to belong.** Finally, I tested characteristic need to belong as a moderator in the same way as previous models. Regardless of which reflection composite was used, no three-way interactions of need to belong, enhancement strategy, and condition emerged (see Table 3). However, both reflection composites resulted in significant enhancement strategy by need to belong interactions. Again, I ran simpler mixed models to investigate

these lower level effects. As Figure 3a shows, when using the averaged composite, the need to belong by enhancement strategy interaction was significant,  $F(1,187) = 4.57, p = .03$ . The only simple effect that emerged was a moderate effect of the need to belong using reflection,  $b = -0.14, SE = 0.07, t(187) = -1.90, p = .06, 95\%CI(-0.28,0.01)$ , suggesting that the tendency to use reflective self-enhancement strategies has a slight negative association with the need to belong. A similar pattern emerged when using the multiplicative reflection composite (Figure 3b),  $F_{interaction}(1,187) = 3.95, p < .05$ . Again, the only simple effect present was a moderate effect of the need to belong at reflection,  $b = -0.14, SE = 0.07, t(187) = -1.80, p = .06, 95\%CI (-0.28, 0.006)$ .

## Discussion

The results of Study 1 did not support Hypothesis 1. Regardless of how the reflection composite was created, the hypothesized belonging status condition by enhancement strategy interaction was never found. Further, the expected main effect of condition such that those who remembered being excluded would engage in more self-enhancement than those who remember being included was not supported. Additionally, whereas individual difference measures never moderated the hypothesized interaction, I did find some evidence for differences in enhancement preference based on individual differences.

When using an averaged reflection composite, self-esteem, narcissism, humility and an ability social comparison orientation were all positively associated with overall self-enhancement. Additionally, this composite resulted in moderate narcissism by self-enhancement strategy and a significant need to belong by self-enhancement strategy



*Figure 3.* The need to belong by enhancement strategy interaction, Study 1. Panel A shows the interaction using the averaged reflection composite. Panel B shows the interaction using the multiplicative reflection composite.



interactions. These interactions showed a similar pattern, in both cases the relationship between the trait and self-enhancement was stronger for the reflection strategy (positive for narcissism; negative for need to belong).

Using a multiplicative reflection composite, self-esteem, narcissism, and ability social comparison orientation were again positively related to overall self-enhancement. The self-esteem and narcissism effects were qualified by a marginal and significant trait by enhancement strategy interaction (respectively). In both cases, again the relationship between the trait and self-enhancement was stronger for the reflection strategy (positive relationship). There was also a significant need to belong by enhancement strategy interaction that was stronger for reflection (negative relationship). Together these results suggest that individual differences may change the way people engage with reflection as a self-enhancement strategy.

## CHAPTER 3

### STUDY 2

Study 2 was designed to test H2: self-enhancement strategy is moderated by the context of the self-enhancement opportunity. Manipulating the opportunity for esteem boosts that facilitate or interfere with belonging should differentially predict self-enhancement strategy. Study 2 was also an experimental mixed design with context of enhancement opportunity (private/low cost to belonging, public/high cost to belonging) treated as a between-subjects variable and enhancement strategy (comparison, reflection) as a within-subject variable. Additionally, since participants came to the lab with a friend, participants are nested within dyad to control for the non-independence of friendships.

#### **Method**

An initial power analysis suggested the 2x2 mixed factorial ANOVA would require a total sample size of 200 to detect a small effect (*Cohen's f* = .10) at  $\alpha < .05$  with 80% power ( $1-\beta$ ). My estimate was intentionally conservative in two ways: (1) I treated the 200 as the number of dyads rather than the number of individual participants. Within-subject variables (and mixed designs) have more power by design so it is likely an effect would be observed with fewer than 200 dyads. Moreover, (2) I hypothesized a small effect size. I completed a sequential analysis plan to analyze data at 129 dyads. The results of the interim analyses suggested an adjusted *p*-value of .03225 as a standard of significance (full plan in Appendix C). All results of Study 2 will use this adjusted *p*-value to determine statistical significance of the effects.

**Participants.** One-hundred and twenty-nine people self-selected to participate through the SONA experimental management system in exchange for course credit. Participants were told ahead of time to attend the lab session in pairs with a friend. Thus, two hundred and fifty-eight participants made up 129 dyads. As requested by the participant (during debriefing), one person's data was removed before analyses. Individual differences were measured at a different time online. Participants were asked to create a unique ID to merge data from the online and lab session. I was able to match 68 people ( $n_{\text{before}} = 29$ ,  $n_{\text{after}} = 39$ ). One of those participants missed both attention filter questions so their online data was removed from the dataset. Thus, there are 129 dyads made up of 257 individuals ( $n_{\text{women}} = 187$ ,  $n_{\text{men}} = 70$ ), 67 for whom I have individual difference measures data. Demographics were only collected online. Therefore, for the full 67 cases, participants were on average 18.63 years old ( $SD_{\text{age}} = 0.95$ ) and mostly identified as white (75.41%, 18.03% Asian, and 6.56 Black or African American).

**Procedures.** Participants completed individual difference measures online (Appendix A) either before or after their lab session. All lab procedures, instructions, and items for Study 2 are in Appendix D. During the lab portion participants (two per session) begin at separate cubicles. All participants completed the difficult Remote Associates Test (McFarlin & Blascovich, 1984; Mednick, 1962) and were given the same instructions and failure feedback as described in Study 1. After completing the RAT both participants were brought into a conference room and seated at opposite ends of a long table. Participants were told they would be completing two more tasks in the conference room. The first task involved answering some questions on paper about themselves and their friend (in the same room) relative to each other and to other people. These questions

were the comparison and reflection measures described in Study 1 (again, presented in a randomized order). The context of the self-enhancement opportunity was manipulated before completing the questionnaires. Participants were told when they were finished with the measures, either (a) they needed to fold their papers and put them in the box on the table (private condition) no one would see their responses and then they would move on to the next task or (b) they would be swapping finished questionnaires with their friend (public condition) before continuing. After participants completed their questionnaires and (a) placed them in the box or (b) indicated to the experimenter they were ready to swap with their partner the study was complete and participants were debriefed.

**Online measures.** Participants completed the same individual difference measures discussed in Study 1, again in a randomized order online at the participant's convenience either before or after completing the other study relevant tasks in the lab. Descriptive information and Cronbach's  $\alpha$  for each measure are presented in Table 1.<sup>6</sup>

**Lab measures.** The same measures of comparison and reflection described in Study 1 were used in Study 2. However, since these measures were completed on paper, to implement the cover story, responses were indicated on 11-point scales rather than 100-point sliders. Descriptive information and Cronbach's  $\alpha$  for each measure are presented in Table 1.

***Reflection composites.*** Again, to address the exploratory question regarding different conceptualizations of the reflection construct, two reflection composites were

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<sup>6</sup> The relationship between ability and opinion social comparison orientations was similar to that in Study 1,  $r(67) = 0.34, p < .01$ .

created (average and multiplicative). Friend-other comparison and closeness were standardized prior to creating the composites ( $r[257] = 0.31, p < .0001$ ).

As in Study 1, because creating the composite changed the scaling of the reflection construct (average,  $M = 0.00, SD = 0.81$ ; and multiplicative,  $M = 0.00, SD = 1.05$ ) I re-standardized the composites before running analyses. To better understand how the two self-enhancement strategies may be related, I also examined the correlation between each reflection composite and comparison. In this sample, comparison was negatively associated with reflection when treated as a mean ( $r[257] = -0.27, p < .0001$ ), but was unrelated to reflection when treated as a multiplicative composite ( $r[257] = 0.01, p = .82$ ).

## Results

**Analysis plan.** To test H2 (self-enhancement strategy is moderated by the context of the self-enhancement opportunity), the proc mixed function in SAS 9.4 was used to analyze multiple regressions in the context of multi-level models. In these models reflection and comparison scores were treated as within-subject factors and enhancement opportunity (condition: private, public) was treated as a between-subjects factor. Additionally, to control for the non-independence of friends, all participants were nested within dyad. All of the reflection composites and the comparison variable were standardized prior to analyses so that the within person variables would be on the same scale. To investigate individual difference moderation, all individual difference variables were standardized and significant interactions were decomposed at one standard deviation above and below the mean (Cohen et al., 2003).

**Hypothesis 2.** Results of the hypothesized interactions are displayed in Table 4.

When using the average reflection composite, the hypothesized main effect of condition is not significant. Nonetheless, a significant interaction did emerge. As seen in Figure 4 and as hypothesized, the preference for reflection when self-enhancement is relatively public ( $b = -0.32$ ,  $SE = 0.11$ ,  $t[127] = -2.81$ ,  $p = .0057$ , 95%CI [-0.54,-0.09]) was greater than when self-enhancement is relatively private ( $b = 0.35$ ,  $SE = 0.12$ ,  $t[127] = 2.94$ ,  $p = .004$ , 95%CI [-0.58,-0.11])<sup>7</sup>. However, the preference was not technically larger as evidenced by the nearly identical  $b$ s, but the effects were in the opposite direction.

When the multiplicative reflection composite is used a different interaction emerges. In this model, the effect of condition was the opposite of the hypothesis: people enhanced more in the public condition than in the private condition. The effect of enhancement was also significant, people were, overall, more willing to compare than reflect. Both of these effects were qualified by the significant condition by enhancement strategy interaction (see Table 4). As Figure 5 shows, the preference is a little different than when the averaged reflection composite was used. In this case, when enhancement is relatively private ( $b = -0.53$ ,  $SE = 0.13$ ,  $t[127] = -4.02$ ,  $p < .0001$ , 95%CI[-0.79,-0.27]), participants preferred comparison to a greater degree than when enhancement was relatively public ( $b = -0.11$ ,  $SE = 0.13$ ,  $t[127] = -0.83$ ,  $p = .41$ , 95%CI [-0.36,0.15])<sup>8</sup>.

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<sup>7</sup> The other simple effects for this interaction were also significant.

Effect of condition at comparison,  $b = -0.25$ ,  $SE = 0.11$ ,  $t(127) = -2.36$ ,  $p = .02$ , 95%CI (-0.47,-0.04).

Effect of condition at reflection,  $b = 0.41$ ,  $SE = 0.11$ ,  $t(127) = 3.77$ ,  $p = .0002$ , 95%CI(0.19,0.62).

Suggesting people were more likely to reflect in the public condition and more likely to compare in the private condition.

<sup>8</sup> The simple effect of condition at reflection was also significant:  $b = -0.41$ ,  $SE = 0.13$ ,  $t(127) = -3.27$ ,  $p < .01$ , 95%CI (-0.66,-0.16).

However the simple effect of condition at comparison was not:  $b = 0.02$ ,  $SE = 0.13$ ,  $t(127) = 0.15$ ,  $p = .88$ , 95%CI (-0.23,0.27).

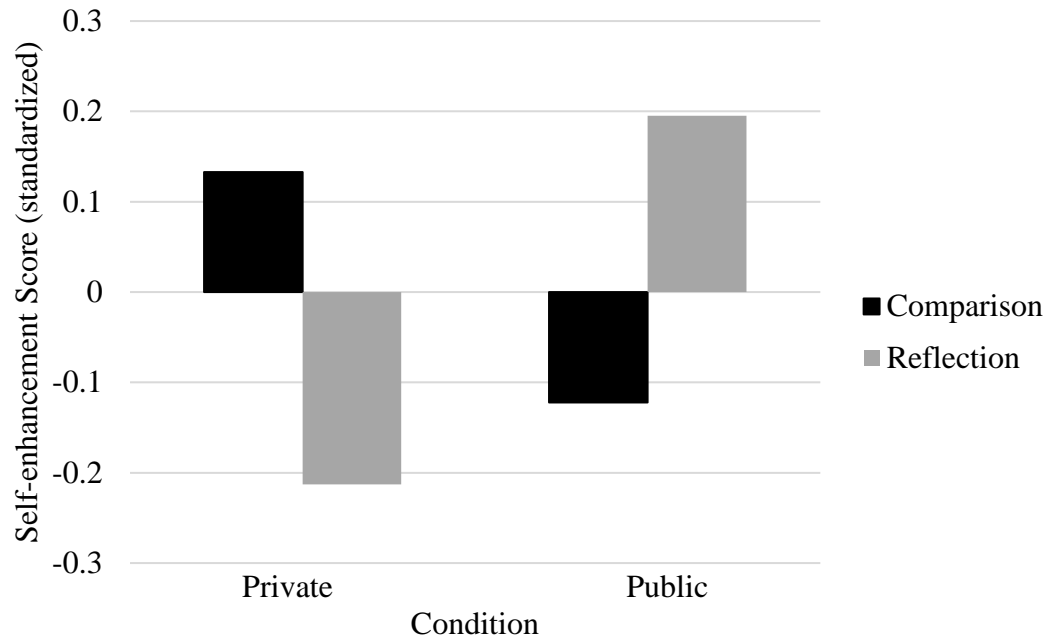
Suggesting people reflect more in public situations than private situations but that the situation does not affect the level of comparison in which they are willing to engage.

Table 4.

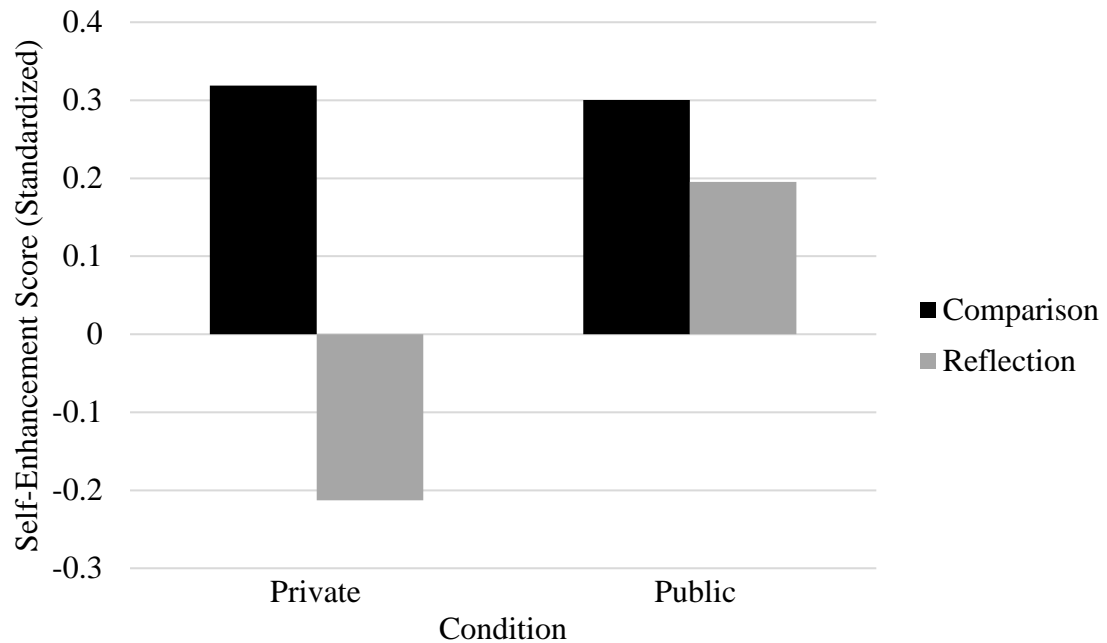
*Study 2, Hypothesis 2: Main Effects and Interactions Associated with Opportunity for Enhancement (condition) for each Reflection Composite.*

<b>Reflection Composite</b>	<b>Main Effect of Condition (between)</b>	<b>Main Effect of Enhancement Strategy (within)</b>	<b>Interaction Between Condition and Enhancement Strategy</b>
Averaged	$F(1,127) = 1.17,$ $p = .28$	$F(1,127) = 0.03,$ $p = .86$	$F(1,127) = 16.53,$ $p < .0001$
Multiplicative	$F(1,127) = 5.24,$ $p = .02$	$F(1,127) = 5.24,$ $p < .001$	$F(1,127) = 5.43,$ $p = .02$

*Note.* Effect sizes are not presented here (as in Table 2) because a multi-level model is used and there is not, yet, an agreed upon effect size to use or protocol for best calculating them.



*Figure 4.* The condition (private, public) by enhancement strategy interaction using the averaged reflection composite, Study 2.



*Figure 5.* The condition (private, public) by enhancement strategy interaction using the multiplicative reflection composite, Study 2.



In this case instead of a greater preference for reflection in public enhancement situations, a lessened preference for comparison was observed.

**Individual differences.** Similar to Study 1, I had no specific hypotheses regarding individual differences. However, again I investigated the extent to which my hypothesized interactions were moderated by individual differences related to self-enhancement (self-esteem, narcissism, humility) and my other constructs (social comparison orientation, need to belong). When examining these effects it is important to remember that I only have individual difference data for 67 participants making a three-way interaction including individual difference variables highly difficult to detect. Additionally, the adjusted  $p$ -value of .03225 was based on having 129 dyads (258 people) of the original 200 dyads (400 people) suggesting an even more conservative  $p$ -value would be needed. For example, having only 67 of the originally estimated 400 people would result in an adjusted  $p$ -value of .008. Thus, I am hesitant to make any strong conclusions based on these analyses. However, I still examined the data for trends or patterns based on individual difference variables.

All individual difference measures were standardized prior to analyses. Again, proc mixed was used to examine regression within the context of a multi-level model. Individual differences and enhancement strategy were level 1 variables (individuals), individual differences were between-subjects, and enhancement strategies were within-subject. All participants were nested within dyad, and condition was treated as a level 2 variable (dyads). Results of these analyses are presented in Table 5. Only two effects reached the adjusted significance of  $p < .008^9$ . The first was a main effect of narcissism

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<sup>9</sup> The author probed all interactions and examined all main effects with a  $p < .05$ ; those results are available upon request.

Table 5.

*Study 2, Main effects and Interactions Associated with Potential Individual Difference Moderators*

Trait	Reflection Composite	Main Effect of Trait F(1,78)	Main Effect of Condition F(1,48)	Interaction Between Trait and Condition F(1,78)	Main Effect of Enhancement Strategy F(1,48)	Interaction Between Enhancement and Condition F(1,48)	Interaction Between Enhancement and Trait F(1,78)	Interaction between Enhancement, Trait, and Condition F(1,78)
Self-Esteem	Averaged	4.90*	1.28	0.02	0.03	4.86*	6.93*	0.33, .57
	Multiplicative	4.85*	0.46	0.96	2.93 <sup>t</sup>	5.52*	5.34*	0.08, .77
Narcissism	Averaged	<b>7.82**</b>	0.40	3.31 <sup>t</sup>	0.04	3.14 <sup>t</sup>	1.04	6.05*
	Multiplicative	6.34*	0.27	5.31*	2.50	3.81 <sup>t</sup>	0.48	2.82 <sup>t</sup>
Humility	Averaged	0.10	0.29	1.23	0.06	3.27 <sup>t</sup>	2.28	3.94*
	Multiplicative	0.01	0.08	1.30	2.41	4.35*	2.91 <sup>t</sup>	1.99
Ability Orientation	Averaged	0.60	0.44	0.54	0.00	3.24 <sup>t</sup>	2.67	0.10
	Multiplicative	0.31	0.08	0.06	2.41	4.26*	2.51	1.42
Opinion Orientation	Averaged	0.02	0.30	0.72	0.07	4.98*	<b>11.24**</b>	1.88
	Multiplicative	2.72 <sup>t</sup>	0.31	2.91 <sup>t</sup>	2.56	4.27*	1.75	0.14
Need to Belong	Averaged	1.16	0.57	0.87	0.00	3.98*	4.39*	0.40
	Multiplicative	1.68	0.18	0.04	2.63	4.86*	3.13 <sup>t</sup>	0.08

<sup>t</sup> $p < .10$  \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , \*\*\*\* $p < .0001$

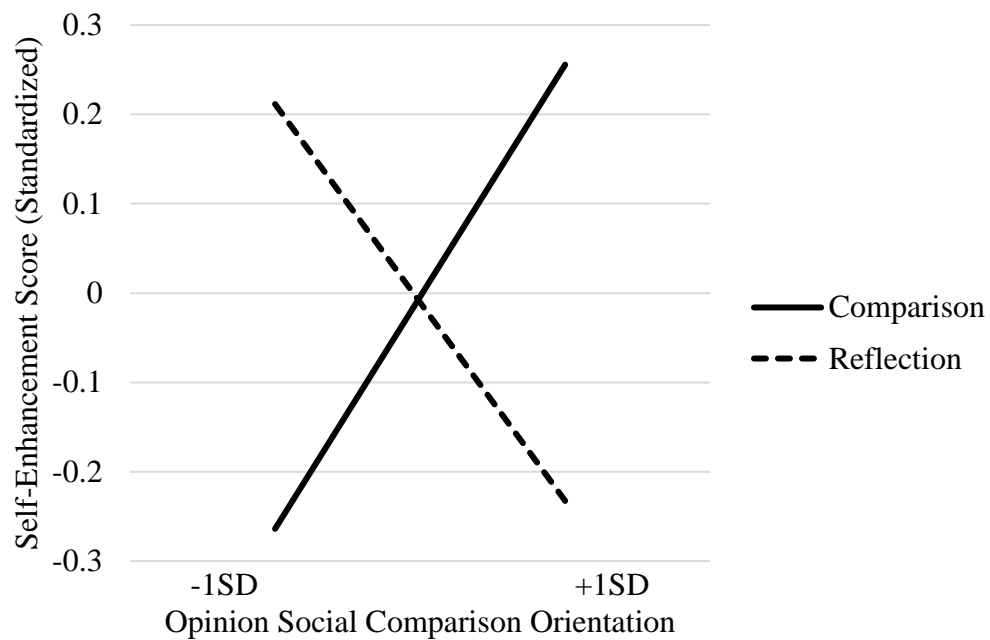
Note. **Bold values** meet the adjusted  $p < .008$  standard.

when the reflection composite was averaged. Running a simpler model to examine this effect resulted in a marginally significant (by the standard of the adjusted  $p$ -value) effect such that narcissism was positively associated with self-enhancement overall,  $b = 0.17$ ,  $SE = 0.07$ ,  $t(83) = 2.62$ ,  $p = .01$ , 95%CI (0.04,0.31). The second was the interaction between opinion social comparison orientation and enhancement when the averaged reflection composite was used. Again running a simpler model that removed condition, I found the two-way interaction was significant,  $F(1,81) = 8.08$ ,  $p < .008$ . This interaction is presented in Figure 6. None of the simple effects reached the significance standard of the adjusted  $p$ -value. However, they were all significant or marginal by the typical standard (all  $p$ s between .02 and .052) suggesting there was a tendency for a positive association between comparison and opinion orientation and a negative association between reflection and opinion orientation<sup>10 11</sup>.

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<sup>10</sup> Effect of opinion at comparison:  $b = 0.26$ ,  $SE = 0.11$ ,  $t(81) = 2.33$ ,  $p = .02$ , 95%CI(0.04,0.48).  
Effect of opinion at reflection:  $b = -0.22$ ,  $SE = 0.11$ ,  $t(81) = -2.00$ ,  $p = .0492$ , 95%CI(-0.44,-0.001).

<sup>11</sup> The other simple effects suggested a preference for reflection over comparison when opinion orientation was low and a preference for comparison over reflection when opinion orientation was high.  
Effect of enhancement at low opinion:  $b = -0.48$ ,  $SE = 0.24$ ,  $t(49) = -1.99$ ,  $p = .0521$ , 95%CI(-0.96,0.004)  
Effect of enhancement at high opinion:  $b = 0.49$ ,  $SE = 0.23$ ,  $t(49) = 2.04$ ,  $p < .05$ , 95%CI(0.01,0.97)



*Figure 6.* The opinion social comparison orientation by enhancement strategy using the averaged reflection composite, Study 2.

## CHAPTER 4

### GENERAL DISCUSSION

In Study 1, I found no support for remembering an exclusion (vs. inclusion) experience resulting in more self-enhancement, nor did I find a significant interaction between belonging status (inclusion, exclusion) and self-enhancement strategy. However, I found some evidence that self-esteem and narcissism are positively associated with the use of reflection as a self-enhancement strategy and the need to belong is negatively associated with the use of reflection. In Study 2, the hypothesized main effect of context of self-enhancement opportunity (private, public) is only evidenced when using a multiplicative reflection composite. Even then, it is in the opposite direction from what I expected: people enhanced more in the relatively public condition than in the relatively private condition (this effect was qualified by an interaction, explained below). The hypothesized enhancement opportunity by enhancement strategy interaction was found for both reflection composites, however the pattern of simple effects was different. Closest to my hypothesis, when the averaged reflection composite was used there was a preference for reflection over comparison in the relatively public condition versus a preference for comparison over reflection in the relatively private condition. When the multiplicative composite is used, the interaction is explained by a larger preference for comparison when self-enhancement is private than when self-enhancement is public. Statistically, these two interactions are presenting a different pattern, however to an outside observer an individual's behavior might be explained fairly similarly: when

someone self-enhances in public they should be less likely to compare themselves to others and be more likely to positively reflect on the accomplishments of their friends.

### **The Choice of Reflection Composite**

In Study 1, the averaged and multiplicative composites made very little difference in terms of the effects observed. The averaged composite resulted in a main effect of self-esteem, a marginal narcissism by enhancement strategy interactions, and a need to belong by self-enhancement strategy interaction. The multiplicative composite resulted in a marginally significant self-esteem by enhancement strategy interaction, and significant narcissism and need to belong by self-enhancement strategy interactions. All of the interactions (using both composites) could be explained in the same way: there was a stronger relationship between enhancement and trait when reflection was used to self-enhance (positive for narcissism and self-esteem, negative for need to belong). Strangely, when the multiplicative composite was used, the narcissism by strategy interaction could be explained the other way as well: people lower in narcissism reflected significantly *less* than compared and people higher in narcissism reflected significantly *more* than compared. These findings go against the current understanding of the relationship between narcissism and self-enhancement (e.g., Campbell, Reeder et al., 2000).

In Study 2, the story is a bit more complicated. Both the averaged and multiplicative reflection composites resulted in a significant enhancement strategy by condition (private, public) interaction. Using the averaged composite, the interaction is explained by a preference for reflection when self-enhancement is relatively public and a preference for comparison when self-enhancement is relatively private. Using the multiplicative composite, the interaction is explained by a larger preference for

comparison when self-enhancement is relatively private vs. a smaller preference for comparison when self-enhancement is relatively public. The multiplicative composite also resulted in a main effect of both condition and enhancement that are difficult to explain theoretically (granted they are both qualified by the interaction).

The main effects of the multiplicative composite suggest people enhance more in public than in private and compare more than reflect. The former suggests people may have been concerned with positive self-presentation: wanting to appear positively to their friends. People are willing to help their friends present positively when it will benefit their friend (Schlenker & Britt, 1999) so it is possible participants took advantage of the fact that their friends would be okay with enhancing self-presentation. However, research also suggests that people have a harder time making favorable self-presentations to friends (vs. strangers; Tice, Butler, Muraven, & Stillwell, 1995) or when trying to make friends (vs. get a job; Le Barbenchon, Milhabet, & Bry, 2016 ). Furthermore, when people self-present in counter-normative ways (e.g., boasting to friends) it depletes their regulatory resources (Vohs, Baumeister, & Ciarocco, 2005) suggesting it should be done sparingly. Taken together, the main effect of condition on enhancement that emerges from the multiplicative composite (but not the averaged composite) is not only counterintuitive but also hard to support with the existing literature.

In regard to the main effect of enhancement strategy, it is possible greater comparison over reflection was a result of how the constructs were measured (e.g., it might be easier to consider yourself vs. your friend than to consider your friend vs. most other people). Yet, it seems strange that people would be more willing to self-enhance at the expense of their friend than at the expense of the nebulous group “most other people.”

It is also worth noting that in both studies the comparison measure had fairly low internal consistency ( $\alpha = 0.53, 0.66$ ) which suggests the measure itself was not perfect and all of the items may not be assessing the same things (e.g., there may be multiple factors).

Lastly, in both studies, the averaged reflection composite was negatively related to the comparison measure (Study 1:  $r[204] = -0.13, p = .06$ ; Study 2:  $r[257] = -0.27, p < .0001$ ) and the multiplicative reflection composite was not correlated with comparison (Study 1:  $r[204] = 0.01, p = .89$ ; Study 2:  $r[257] = 0.01, p = .82$ ). Considering, I believe these are two distinct self-enhancement strategies it makes more theoretical sense for them to be negatively related than not related at all. The observed relationships between the constructs, the strange Study 1 finding regarding narcissism when the multiplicative composite is used, the anti-theoretical lower level effects of Study 2, and the fact that the averaged composite is a simpler way to handle the reflection construct leads me to the parsimonious conclusion that the averaged composite should be recommended above the multiplicative composite.

### **Reaction versus Anticipation**

The null effects of Study 1's primary hypothesis make it difficult to draw strong conclusions. Previous research has used recall/writing tasks to manipulate belonging (e.g., Knowles & Gardner, 2008; Pickett et al., 2004); however, it is possible that simply recalling a time when one felt included versus excluded is not enough to produce a difference in self-enhancement strategy. In other words, feeling excluded by your friends is not the same thing as the social cost incurred by bragging about yourself at your friend's expense.



In Study 1, a preference for the reflection strategy would be a *reaction* to the feeling of exclusion and a belief that reinstatement in the group would depend on choosing a self-enhancement strategy that would not alienate group members further. In Study 2, participants were not asked to react to previous experiences, but instead were asked to enhance in the moment and *anticipate* what their self-enhancement might do to their relationship. Thus, it is possible that people only recognize reflection as a less costly self-enhancement strategy when they think about costs to future interactions but do not regard reflection as a reinstatement strategy into groups from which they have already been excluded. This idea is further supported by the moderation effects of need to belong in Study 1: need to belong was negatively associated with reflection. Perhaps reflection works best to strengthen (or at least not weaken) existing bonds rather than to be accepted by someone or some group who is not interested in including you.

It is also possible that recalling an exclusion experience results in a “what the hell response” (Cochran & Tesser, 1996; Polivy & Herman, 1985). People may feel that they have already been ousted by the group and instead of worrying about being included, over compensate with a nonchalant attitude – acting as though they do not care about the group from which they have been excluded. Rather, they may focus on their own positive attributes and self-enhancement opportunities believed to have the biggest boost to their self-esteem. I did not directly test this idea, but it is also possible that recalling an exclusion experience from one group may have shifted to which group participants would turn to gain a sense of belonging (e.g., Brewer, 1991, 1993; Brewer & Gardner, 1996; Palmonari et al., 1989).

This latter point about shifting groups may have occurred in the design of Study 1 itself. Another major difference between Study 1 and Study 2 is that in Study 1 participants were asked to name a friend at the beginning of the study and use that friend as the target of the comparison and reflection measures assessed at the end of the study. However, participants could write about *any* inclusion/exclusion experience. Thus, it is possible the friend they named and used in the dependent variable assessments may not have been involved in the inclusion/exclusion experience about which they wrote earlier in the study.

### **Individual Differences**

As mentioned previously, it is hard to make any strong claims regarding individual difference moderation in Study 2. Study 1, on the other hand, may offer some insight. In Study 1, using the averaged reflection composite, the main effects of self-esteem and narcissism suggest both are positively related with self-enhancement. Similarly, Brown (1986) found individuals higher in self-esteem (vs. lower) were more likely to rate both themselves and their friends more positively. Additionally, Campbell, Reeder and colleagues (2000) found narcissists (relative to non-narcissists) are willing to engage in comparative and non-comparative self-enhancement strategies. What is harder to explain is the positive association between humility and self-enhancement. A close examination of Table 1 shows that humility was measured on a seven-point scale with an average of 5.39 and a standard deviation of 0.81. This suggests the measure of humility itself presented a better than average effect where most people viewed themselves above the midpoint on humility. Likewise, although I do not recommend using the multiplicative reflection composite, the strange findings regarding narcissism (i.e., low

narcissism associated with more comparison than reflection and the opposite for high narcissism) may be explained by the very low average narcissism in Study 1, 3.88 (summed scores could range from 0 to 13). Since the standard deviation was 2.54, both the “lower narcissism” and “higher narcissism” individuals would be below the midpoint of the summed scale (i.e., 6.5). Given the significant effects in Study 1 were somewhat unexpected and were based on unusual means, coupled with the inability to properly test for moderation by individual differences in Study 2 (because of the small sample size) I am cautious to make any strong claims. Individual differences in the preference for certain self-enhancement strategies over others needs to be further investigated.

### **Future Directions**

I see three study packages coming from this work. Two of which have to do with the measures themselves. I would like to fine tune the measures of reflection and comparison and work on a scale development project. So far, my work suggests that when the averaged reflection composite is used the two measures are negatively related which suggests the two measures are assessing different self-enhancement strategies. However, I'd like to test the construct validity of my measures, particularly the convergent and divergent validity of each. For example, I would expect my measure of comparison to be related to other measures of the better than average effect (e.g., the “How I see Myself Questionnaire,” Taylor & Gollwitzer, 1995). Additionally, I would like to collect enough data to run an exploratory factor analysis on my measures. As mentioned previously, the internal consistency of the comparison measure was fairly low ( $\alpha = 0.53, 0.66$ ) and I wonder if it is possible that the measure includes multiple factors. Some of the items appear more subjective (e.g., desirable, attractive) than others (e.g.,

competent, confident); or perhaps it is a matter of agentic values (e.g., talented, interesting) versus more communal values (e.g., responsible, kind, warm).

The second study package I see coming from this work is to further investigate the relationship between these self-enhancement strategies and individual differences. Even though the individual difference measures were always assessed at a different time point than the rest of the study, the comparison and reflection strategy measures were always assessed during a lab session that included multiple ego threats (self-esteem/competence and belonging). I would like to run a purely correlational design to see if the associations observed in Study 1 would hold up without these manipulations. For example, I am still surprised that humility was associated with greater overall self-enhancement and that people higher in narcissism were more likely to reflect than compare. I think a purely correlational design would help us to better understand these associations.

The third set of studies I see coming from this work is a further explanation of the reactive versus anticipatory use of self-enhancement strategies regarding belonging threats. As discussed above, I wonder if part of the reason the manipulation did not work in Study 1 was because a reflective self-enhancement strategy would have been in reaction to a perceived threat to belonging in the past whereas in Study 2 a reflective strategy might keep a belonging threat from occurring. I would like to experimentally test this idea by giving participants the chance to self-enhance through both strategies (comparison and reflection) in either a reactive condition where the belonging threat has already occurred or in an anticipatory condition where the threat has not yet occurred. In this new study, I would also like to make sure that I correct a limitation I mentioned

above. Namely, I would want to ensure that in both the reactive and anticipatory conditions the target of the comparison/reflection measures was (or will be) directly involved in the experience that threatens belonging.

### **Competing Motivations, Revisited**

This work helps to expand our understanding of the self-evaluation maintenance model (SEM; Tesser, 1985; Tesser et al., 1988; Tesser & Moore, 1998) by directly assessing a person's engagement with reflection and comparison. Tesser and colleagues' work helped identify which parts of this model had the most predictive power. For example, changes in reflection and comparison were found when the friend was the target not the stranger. Thus, I used SEM to help develop my design. Whereas SEM considers the esteem regulating process in regard to the threat of someone else's successful performance and the relevance of that domain, I used one's poor performance in the intellectual domain. Additionally, instead of considering manipulating belonging threats concerning strangers versus friends, I manipulated how costly self-enhancement strategies were to belonging when considering friends only. Therefore, I was able further investigate the predictions of SEM in a new way and assess self-enhancing strategies directly.

A person has many higher order goals for which they are striving simultaneously. A desire for self-esteem and the need to belong are just two of those goals, both of which are maintained by self-regulating processes. Self-enhancement generally prioritizes the self, whereas belonging considers the self as part of a larger network of individuals thus taking into account other's views of self. Because both the need to feel positively about

the self and the need to belong involve perceptions of the self we need to consider more ways in which these two processes may influence each other.

Some research has investigated how self-enhancement strivings can be interpersonal (e.g., Brown & Han, 2012; Cialdini et al., 1976; Cialdini & Richardson, 1980). However, this previous work did not directly assess or implicate belonging motivation or needs. My work posits the self-regulating processes of self-esteem and belonging will, at times, come into competition. When this competition arises, people are faced with the necessity to prioritize their needs to dictate their behaviors. Many research designs used thus far, present participants with situations that make self-enhancement the preferred, if not only, response to ego threat (Troe, 1986) and the self-enhancing opportunities presented are often constrained to very specific strategies (Campbell, Reeder, et al., 2000; Campbell, Sedikides, et al., 2000).

In my work I presented people with multiple opportunities and found when faced with multiple strategies for restoring self-esteem after an ego threat, people consider how these strategies will influence their relationships (need to belong). Specifically, when a person's self-enhancement is likely to be observed by their friend they are less willing to directly self-enhance (as assessed by downward social comparison directed at that friend) and seem more willing to engage in reflective self-enhancement strategies (with their friend as the target) to restore a positive sense of self. These findings suggest that when these two higher order goals compete, people generally prioritize their need to belong over their need to feel positively about the self. Or, at least, people consider ways to feel positively about the self that do not threaten their ability to maintain important relationships. The idea that some people may be more able to recognize the conflict

between motivations than others needs to be further investigated with larger sample sizes to assess individual differences.

## **Conclusions**

As a whole, this work suggests there is something different about comparison and reflection strategies of self-enhancement. It is also one of the first attempts to give participants multiple ways to reestablish self-esteem after a threat. Future research should continue to investigate the roles that individual differences and the temporal nature of threats (particularly threats to belonging) play in the self-enhancement process. It is my hope that this work provides some insight into new ways of understanding self-enhancement especially when people are concerned with multiple higher order goals at once (e.g., self-esteem, belonging).

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## APPENDICES

## Appendix A

**Online Measures****Trait Self-Esteem**

*Rosenberg Self-Esteem Scale (Rosenberg, 1979)*

Instructions: Please complete the questionnaire that follows by indicating the degree to which each statement is true or characteristic of you.

1	2	3	4	5
Not at all like me				Very much like me

1. I feel that I am a person of worth, at least on an equal basis with others.
2. I feel that I have a number of good qualities.
3. All in all, I am inclined to feel that I am a failure.
4. I am able to do things as well as most other people.
5. I feel that I do not have much to be proud of.
6. I take a positive attitude toward myself.
7. On the whole, I am satisfied with myself.
8. I wish I could have more respect for myself.
9. I certainly feel useless at times.
10. At times I think that I am no good at all.



## Narcissism

*Brief Narcissistic Personality Inventory (NPI-13; Gentile, Miller, Hoffman, Reidy, Zeichner, & Campbell, 2013)*

**Instructions:** In each of the following pairs of attributes, choose the one that you **MOST AGREE** with. Mark your answer by writing **EITHER A or B** in the space provided. Only mark **ONE ANSWER** for each attitude pair.

- \_\_\_\_ 1. A I find it easy to manipulate people.  
B I don't like it when I find myself manipulating people.
  
- \_\_\_\_ 2. A When people compliment me I get embarrassed.  
B I know that I am a good person because everybody keeps telling me so.
  
- \_\_\_\_ 3. A I like having authority over other people.  
B I don't mind following orders.
  
- \_\_\_\_ 4. A I insist upon getting the respect that is due me.  
B I usually get the respect I deserve.
  
- \_\_\_\_ 5. A I don't particularly like to show off my body.  
B I like to show off my body.
  
- \_\_\_\_ 6. A I have a strong will to power.  
B Power for its own sake doesn't interest me.

- \_\_\_\_ 7. A I expect a great deal from other people.  
B I like to do things for other people.
- \_\_\_\_ 8. A My body is nothing special.  
B I like to look at my body.
- \_\_\_\_ 9. A Being in authority doesn't mean much to me.  
B People always seem to recognize my authority.
- \_\_\_\_ 10. A I will never be satisfied until I get all that I deserve.  
B I will take my satisfactions as they come.
- \_\_\_\_ 11. A I try not to be a show off.  
B I will usually show off if I get the chance.
- \_\_\_\_ 12. A I am a born leader.  
B Leadership is a quality that takes a long time to develop.
- \_\_\_\_ 13. A I like to look at myself in the mirror.  
B I am not particularly interested in looking at myself in the mirror.

## Humility

*Humility Scale (Powers, Nam, Rowatt, & Hill, 2007)*

Instructions: Below is a list of trait pairs. For each trait pair indicate on the scale where you fall between the two traits.

Arrogant	X	X	X	X	X	X	X	Humble
Immodest	X	X	X	X	X	X	X	Modest
Disrespectful	X	X	X	X	X	X	X	Respectful
Egotistical	X	X	X	X	X	X	X	Not self-centered
Conceited	X	X	X	X	X	X	X	Not conceited
Intolerant	X	X	X	X	X	X	X	Tolerant
Close-minded	X	X	X	X	X	X	X	Open-minded

## Social Comparison Orientation

*Iowa-Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999)*

Instructions: Most people compare themselves from time to time with others. For example, they may compare the way they feel, their opinions, their abilities, and/or their situation with those of other people. There is nothing particularly ‘good’ or ‘bad’ about this type of comparison, and some people do it more than others. We would like to find out how often you compare yourself with other people. To do that we would like to ask you to indicate how much you agree with *each* statement below, by using the scale provided.

1	2	3	4	5
I disagree strongly				I agree strongly

1. I often compare how my loved ones (boy or girlfriend, family members, etc.) are doing with how others are doing.
2. I always pay a lot of attention to how I do things compared with how others do things.
3. If I want to find out how well I have done something, I compare what I have done with how others have done.
4. I often compare how I am doing socially (e.g., social skills, popularity) with other people.
5. I am not the type of person who compares often with others. (*reverse scored*)
6. I often compare myself with others with respect to what I have accomplished in life.
7. I often like to talk with others about mutual opinions and experiences.
8. I often try to find out what others think who face similar problems as I face.
9. I always like to know what others in a similar situation would do.
10. If I want to learn more about something, I try to find out what others think about it.
11. I *never* consider my situation in life relative to that of other people. (*reverse scored*)

## Need to Belong

*Need to Belong Scale (Leary, Kelly, Cottrell, & Schreindorfer, 2013)*

Instructions: Please indicate the degree to which each statement is true or characteristic of you.

- | 1          | 2  | 3          | 4    | 5         |
|------------|--|------------|------|-----------|
| Not at all | Slightly   | Moderately | Very | Extremely |
| 1.         | If other people don't seem to accept me, I don't let it bother me. ( <i>reverse scored</i> )       |            |      |           |
| 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. ( <i>reverse scored</i> )                 |            |      |           |
| 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. ( <i>reverse scored</i> ) |            |      |           |
| 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 B

### Lab Procedure, Instructions, and Items: Study 1

#### Self-esteem Threat Induction

##### Difficult Remote Associates Test

*(Adapted from McFarlin & Blascovich, 1984)*

Instructions: During the following task you will see 12 word sets. Each word set will contain three (3) words. All three words are related to a fourth word (not shown). It is your job to determine what that fourth word is and to report it.

For example, you may see:

Shelf

Read

End

The correct response would be “book”

High scores on the task are related to creativity and cognitive ability. Therefore, correct responses to more difficult questions will gain more points.

First you will do two practice problems and be told what the right answer is.

After those trials you will see a page with all 12 of the word sets presented at once.

**You will have 10 minutes** to solve as many of the word sets as you can. You can submit your responses after 5 minutes, and the computer will automatically advance after 10 minutes.

You are welcome to jump around, but make sure you have a response written for each before the page advances.

At the end of the task, your score will be presented.

Presented one at a time.

Trial word sets (correct responses):

1. Car, swimming, cue (pool)
2. Mouse, sharp, blue (cheese)

Presented on one page.

Word sets (correct responses):

1. Bass, complex, sleep (deep)
2. Chamber, staff, box (music)
3. Sea, home, stomach (sick)\*
4. Desert, ice, spell (dry)
5. Base, show, dance (ball)
6. Inch, deal, peg (square)
7. Soap, shoe, tissue (box)
8. Cookies, sixteen, heart (sweet)\*
9. Blood, music, cheese (blue)
10. Skunk, kings, boiled (cabbage)
11. Jump, kill, bliss (joy)
12. Athletes, web, rabbit (foot)\*

\*represents an easy word set

The task is designed to take a minimum of 5 minutes. If you are not able to advance the page it is because it has been fewer than 5 minutes. Please try to solve more problems.

(After 5 minutes the participant could advance).

Please wait while the computer calculates your score.

Your responses indicate you received 25% of the possible points on this task.

This score places you in the 54 percentile of students completing this task.

### **Belonging Manipulation**

#### **Inclusion (Exclusion) Writing Prompt**

*(Adapted from Gailliot & Baumeister, 2007)*

Instructions: Please think about a time when you felt that others did (did not) want to be in your company and when you felt (did not feel) a strong sense of inclusion with another person or group. Once you have thought of your experience, please take about five minutes to write about the time you brought to mind.

### **Dependent Variable Measures**

#### **Comparison**

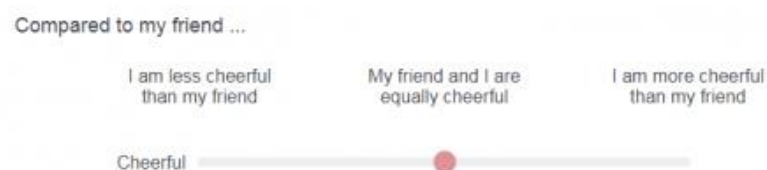
*(Procedures and items adapted from Allan & Gilbert, 1995; Brown & Han, 2012; Taylor & Gollwitzer, 1995.)*

Instructions: On the next page, you will see 10 traits each followed by a slider scale representing how you and *name of friend* may be similar or different on each trait.

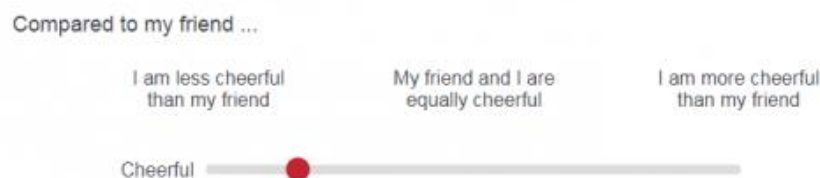


Please indicate how you would **rate yourself relative *name of friend*** by sliding the bar to represent the degree to which you are similar/different on each trait.

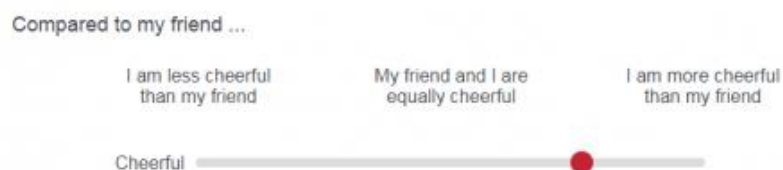
**For example,**



If you believe you are less cheerful than your friend, you would move the slider somewhere to the left of center on the line.



If you think you are more cheerful than your friend, you would be put your slider somewhere to the right of center on the line.



1. Compared to *name of friend* ...

I am less  
interesting than  
*name of friend*  
Interesting

*Name of friend*  
and I are equally  
interesting

I am more  
interesting than  
*name of friend*



*All items were presented as shown above substituting the word “interesting” in the item and response scale with each of the following traits:*

- |               |                |
|---------------|----------------|
| 2. Competent  | 7. Responsible |
| 3. Talented   | 8. Kind        |
| 4. Confident  | 9. Warm        |
| 5. Desirable  | 10. Creative   |
| 6. Attractive |                |

### **Reflection**

Composite of friend-other comparison and closeness.

#### *Friend-Other Comparison*

Instructions: On the next page, you will see 10 traits each followed by a slider scale representing how *name of friend* may be similar to or different from most other people on each trait.

Please indicate how you would **rate *name of friend* relative to most other people** by sliding the bar to represent the degree to which *name of friend* and most others are similar/different on each trait.

**For example,**

Compared to most other people ...

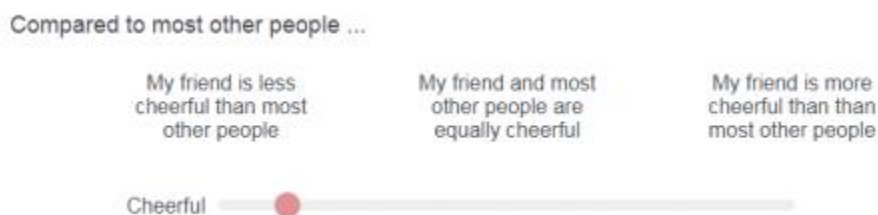
My friend is less  
cheerful than most  
other people

My friend and most  
other people are  
equally cheerful

My friend is more  
cheerful than than  
most other people

Cheerful 

If you believe your friend is less cheerful than most other people, you would move the slider somewhere to the left of center on the line.



If you think your friend is more cheerful than most other people, you would be put your slider somewhere to the right of center on the line.



### 1. Compared to most other people

*Name of friend*  
is less  
interesting than  
most other  
people.  
Interesting

*Name of friend*  
and most other  
people are  
equally  
interesting

*Name of friend*  
is more  
interesting than  
most other  
people.



*All items were presented as shown above substituting the word “interesting” in the item and response scale with each of the following traits:*

- |               |                |
|---------------|----------------|
| 2. Competent  | 7. Responsible |
| 3. Talented   | 8. Kind        |
| 7. Confident  | 9. Warm        |
| 8. Desirable  | 10. Creative   |
| 9. Attractive |                |

### *Closeness*

Instructions: Please think about *name of friend* and answer the following questions.

1. How much do you want to interact (e.g., in person, on the phone, via email) with your friend in the next few days?

*(1 = definitely uninterested in interacting with this person, 4 = Am neutral about interacting with this person, 7 = definitely interested in interacting with this person)*

2. How positively do you feel about your friend?

*(1 = not at all positive, 4 = moderately positive, 7 = extremely positive)*

3. How negatively do you feel about your friend?

*(reverse scored; 1 = not at all negative, 4 = moderately negative, 7 = extremely negative)*

4. How close do you current feel to your friend?

*(1 = not at all close, 4 = moderately close, 7 = extremely close)*

5. How close do you currently feel to your friend? (responses adapted from Inclusion of Other in the Self; Aron, Aron, & Smollan, 1992)

## Appendix C

**Sequential Analysis Plan as Presented on the Open Science Framework****Competing Motivations and Self-Enhancement Strategies****Study 2****Currently in Data Collection Phase****Sequential Analysis Plan**

**Background:** According to Lakens (2014), conducting studies designed with high statistical power can present some obstacles in practice - most notably, a drain on resources (e.g., number of available participants, time, money). Lakens presents a sequential analysis as a statistical tool that allows researchers to control Type I error rate while examining their data prior to final data collection. *In sum, a sequential analysis controls for Type I error and reduces the necessary amount of participants.* Based on these intervening analyses a researcher can (a) stop data collection if there is enough evidence to suggest the effect of interest is present, (b) gather more data and perform future interim or final analyses, or (c) end the study if it is highly unlikely the hypothesized effect would be observed in the presence of additional data.

**Reasoning:**

- **The original power analysis** suggested to detect a small effect of *Cohen's*  $f = .10$  at  $\alpha < .05$  with power  $(1-\beta)$  set to .80 a 2x2 mixed factorial ANOVA requires a total sample size of 200. I was intentionally conservative in my estimate in two ways: (a) I treated the 200 as the number of dyads rather than the number of individual participants. Within designs have more power by design so it is likely

an effect would be observed with fewer than 200 dyads. (b) I hypothesized a small effect size.

- **Scientific Reasons:** A sequential analysis controls for type I error and requires fewer resources (e.g., participants, time, money).

### **Sequential Analysis Plan:**

1. I plan to pause data collection for the purposes of an interim analysis on Friday, March 9<sup>th</sup>, 2018. I expected to have 125 dyads on that date.
2. On Friday, March 9<sup>th</sup>, I had 129<sup>12</sup> dyads that I used to determine the appropriate adjusted  $p$ -value. Using Laken's "GroupSeq" package in R (which can be found at <https://osf.io/qtufw/>). I determined an adjusted  $p$ -value of .03225 is necessary to consider an effect significant.
3. Based on the adjusted  $p$ -value I will use the following standards for my analytical decision making:
  - a. If the effects are observed at a  $p \leq .03225$ , I will consider the effect present and stop all future data collection.
  - b. If the effects are observed at a  $p > .03225$ , I will base my decision on the observed effect size.
    - i. If the interim effect size is  $f \geq .075$  I will continue data collection up to the 200 dyads suggested by the original power analysis.
    - ii. If the interim effect size is  $f < .075$  I will consider the effect below the smallest effect size of interest and will terminate the data collection.

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<sup>12</sup> Original document had the correct  $p$  and  $f$  values based on 129 dyads but the number of dyads was listed as the anticipated 125 instead of as the 129 that we had on that date.

## References

- Lakens, D. (2014). Performing high-powered studies efficiently with sequential analyses.  
*European Journal of Social Psychology, 44*, 701-710. doi: 10.1002/ejsp.2023

## Appendix D

### **Lab Procedure, Instructions, and Items: Study 2**

All participants were first told: “Today’s study involves 3 short tasks. The first task takes place on the computers. Please follow along with the prompts on the screen. If you have any questions, I will be right here. When you are finished, please let me know. When you are both done on the computers we will move on to the other tasks. We also ask that you do not talk to each other during or between tasks.”

### **Self-esteem Threat Induction**

#### **Difficult Remote Associates Test**

Identical to Study 1.

#### **Enhancement Opportunity Context Manipulation**

Participants were seated at opposite ends of a long table in the conference room after completing the RAT on the computers.

When both people are in the conference room, they were given the following condition dependent instructions.

**Private Condition:** “The second task involves answering some brief questions about how you see yourself and your friend relative to each other and to other people. Please answer the questions honestly. When you are done with the questions please fold them in half and place them in the box. Your partner will not see your responses. The only person who will see your responses are trained research assistants who will enter your responses into the computer at a later date. When you both have completed the questionnaires and placed them in the box we will move on to the next task that you will complete together.



We have a typo in some of our packets where a response scale showed up on the next page. This may have occurred in your packet. Before finishing your packet, please confirm you have answered all of the questions. I will be here if you have any questions.”

**Public Condition:** “The second task involves answering some brief questions about how you see yourself and your friend relative to each other and to other people. Please answer the questions honestly. When you are finished please flip your questionnaires over and set them on the table. When you are both finished, you will switch papers with each other and have time to look over each other’s responses before moving on to the next task that you will complete together. We have a typo in some of our packets where a response scale showed up on the next page. This may have occurred in your packet. Before finishing your packet, please confirm you have answered all of the questions. I will be here if you have any questions.”

When either both participants placed their responses in the box (private condition) or when both participants are confirmed they were finished (public condition) the study ended. Regardless of condition participants never actually saw each other’s responses.

### **Dependent Variable Measures**

#### **Comparison**

Instructions: Below you will see 10 traits each followed by a line of boxes representing how you and your friend may be similar or different on each trait. Please indicate how you would **rate yourself relative to your friend** by placing an “X” in the box that represents the degree to which you are similar/different on each trait.

For example, If you believe you are less cheerful than your friend, you would put your “X” in a box somewhere to the *left* of center on the spectrum. If you think you are more cheerful than your friend you would put your “X” in a box somewhere to the *right* of center on the spectrum.

I am less <b>cheerful</b> than my friend.				My friend and I are equally <b>cheerful</b> .				I am more <b>cheerful</b> than my friend.		

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For each of the below items, please rate yourself relative to the friend participating in the study with you today.

I am less <b>interesting</b> than my friend.				My friend and I are equally <b>interesting</b> .				I am more <b>interesting</b> than my friend.		

*All items were presented as shown above substituting the word “interesting” in the item and response scale with each of the following traits:*

- |                |                |
|----------------|----------------|
| 2. Competent   | 7. Responsible |
| 3. Talented    | 8. Kind        |
| 10. Confident  | 9. Warm        |
| 11. Desirable  | 10. Creative   |
| 12. Attractive |                |

## Reflection

### *Friend-Other Comparison*

Instructions: Below you will see 10 traits each followed by a line of boxes representing how your friend may be similar or different from most other people on each trait. Please indicate how you would **rate your friend relative to most other people** by placing an “X” in the box that represents the degree to which your friend and most other people are similar/different on each trait.

**For example, if you believe your friend is less cheerful than most other people, you would put your “X” in a box somewhere to the *left* of center on the spectrum. If you think your friend is more cheerful than most other people you would put your “X” in a box somewhere to the *right* of center on the spectrum.**

My friend is less <b>cheerful</b> than most other people.				My friend and most other people are equally <b>cheerful</b> .				My friend is more <b>cheerful</b> than most other people.		

**For each of the below items, please rate your friend participating with you today relative to most other people.**

My friend is less <b>interesting</b> than most other people.				My friend and most other people are equally <b>interesting</b> .				My friend is more <b>interesting</b> than most other people.		

*All items were presented as shown above substituting the word “interesting” in the item and response scale with each of the following traits:*

- |                |                |
|----------------|----------------|
| 2. Competent   | 7. Responsible |
| 3. Talented    | 8. Kind        |
| 13. Confident  | 9. Warm        |
| 14. Desirable  | 10. Creative   |
| 15. Attractive |                |

### *Closeness*

Same as in Study 1.