

THREATENING THE SELF-CONCEPT:  
HOW GRANDIOSE AND HYPERSENSITIVE NARCISSISM RELATE TO  
COMPARATIVE OPTIMISM

A Thesis  
by  
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## **Abstract**

### **THREATENING THE SELF-CONCEPT: HOW GRANDIOSE AND HYPERSENSITIVE NARCISSISM RELATE TO COMPARATIVE OPTIMISM**

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It is important to understand how people react to negative feedback, especially people with overly positive self-concepts. Both grandiose and hypersensitive narcissism are characterized by having an extremely positive self-concept. People high in hypersensitive narcissism tend to rely on other people to maintain their self-esteem, whereas people high in grandiose narcissism maintain their self-esteem on their own by using self-enhancement and self-protection strategies. In the current study, grandiose and hypersensitive narcissism were measured. Participants were then randomly assigned to receive either neutral or negative feedback on a problem-solving test. To assess how negative feedback was internalized, participants' comparative optimism for the future was measured. In this measure, participants were asked how likely they think that desirable and undesirable events are to happen to them compared to their peers. Overall, participants higher in grandiose narcissism tended to be more optimistic, whereas participants higher in hypersensitive narcissism tended to be more pessimistic. Participants were similarly optimistic in the neutral and negative feedback

conditions, and this relationship did not depend on participants' level of grandiose or hypersensitive narcissism.

*Keywords:* narcissism, grandiosity, hypersensitivity, comparative optimism, negative feedback

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## Table of Contents

|   |    |
|---|----|
| Abstract.....   | iv |
| Acknowledgments.....  | vi |
| Threatening the Self-Concept: How Grandiose and Hypersensitive Narcissism Relate to Comparative Optimism..... | 1  |
| Types of Narcissism.....  | 1  |
| Grandiose Narcissism .....  | 3  |
| Hypersensitive Narcissism.....  | 3  |
| Narcissism and a Positive Self-Concept .....  | 4  |
| Narcissism and Unrealistically Positive Views .....   | 6  |
| Comparative Optimism.....   | 7  |
| Threatening the Self-Concept .....  | 10 |
| Threat to the Self-Concept and Comparative Optimism.....  | 15 |
| Current Study .....   | 17 |
| Hypothesis 1.....   | 18 |
| Hypothesis 2.....   | 18 |
| Hypothesis 3.....   | 19 |
| Hypothesis 4.....   | 19 |
| Hypothesis 5.....   | 20 |
| Method .....  | 20 |
| Participants.....   | 21 |
| Measures .....  | 21 |
| Grandiose Narcissism .....  | 21 |
| Hypersensitive Narcissism.....  | 22 |
| Problem-Solving Ability.....  | 22 |
| Comparative Optimism.....   | 22 |
| Exploratory Measures .....  | 23 |
| Self-Esteem.....  | 23 |
| Negative Affect.....  | 24 |

|  |    |
|--|----|
| Procedure .....  | 24 |
| Results.....   | 26 |
| Preliminary Analyses .....   | 26 |
| Main Analysis .....  | 27 |
| Exploratory Analyses.....  | 29 |
| Narcissism, Threat, and Negative Affect .....                                      | 30 |
| Follow-Up Questions .....  | 31 |
| Discussion.....  | 32 |
| Narcissism and Optimism for Desirable and Undesirable Events .....                 | 33 |
| Feedback Manipulation.....   | 34 |
| Results Explained if Participants Did Not Believe the Feedback Manipulation .....  | 35 |
| Results Explained if Participants Did Believe the Feedback Manipulation .....      | 38 |
| Conclusion .....   | 42 |
| References.....  | 44 |
| Appendix A Narcissistic Personality Inventory (NPI).....                           | 54 |
| Appendix B Hypersensitive Narcissism Scale (HSNS).....                             | 58 |
| Appendix C Example LSAT Problem-Solving Question .....                             | 59 |
| Appendix D Comparative Optimism Events .....                                       | 60 |
| Appendix E Negative Items from the Positive and Negative Affect Scale (PANAS)..... | 62 |
| Appendix F Rosenberg Self-Esteem Scale (RSES) .....                                | 63 |
| Appendix G Informed Consent.....   | 64 |
| Appendix H Prompt for Problem-Solving Ability Test.....                            | 66 |
| Appendix I Follow-Up Questions Regarding Problem-Solving Ability Test.....         | 67 |
| Appendix J Debriefing Prompt .....   | 68 |
| Vita.....  | 69 |

### **Threatening the Self-Concept:**

#### **How Grandiose and Hypersensitive Narcissism Relate to Comparative Optimism**

People often encounter negative feedback in their everyday life—for example, receiving a poor test grade, not getting a job offer after an interview, having a poor customer review, and being criticized by loved ones. Whether the negative feedback is well-intentioned or not, it can certainly be unpleasant to experience and could even affect people's well-being. However, negative feedback can be beneficial as well, like when it serves as a reality check that someone has a personal weakness that could use improvement. By being confronted with a personal weakness, people can acknowledge the issue and adapt accordingly. Of course, that potential for productive adaptation depends on how people react to the negative feedback. The current study investigated how narcissism relates to reactions to negative feedback.

People high in narcissism tend to share a few core features (Krizan & Herlache, 2018; Wink, 1991). Some of these features affect how people high in narcissism relate to those around them, such as lacking empathy for other people, having false feelings of entitlement, and exploiting others, including loved ones, for personal gain. The other core features primarily affect how people high in narcissism view themselves. People high in narcissism often engage in fantasies of grandeur, are highly self-absorbed, and can be extremely arrogant because of their excessively positive self-concept. Given people high in narcissism's overly positive views of themselves, it is important to understand how they react to feedback that would threaten their excessively positive self-concept.

#### **Types of Narcissism**

Earlier research on narcissism considered it to be a unidimensional trait. However,

Wink (1991) questioned whether this was the case. Wink noticed that there was a lack of correlation between a few narcissism scales, particularly, two of the most widely-used narcissism scales: the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979, 1981) and the Narcissistic Personality Disorder Scale (NPDS; Ashby et al., 1979 as cited by Wink, 1991). The NPI tended to focus on more grandiosity and exhibitionist qualities, whereas the NPDS highlighted more vulnerability-sensitivity. To test whether there may be distinct types of narcissism, Wink had participants fill out a variety of measures on narcissism and personality, as well as receive observer and spouse ratings of their narcissistic qualities (spanning from grandiosity-exhibitionist related and vulnerability-sensitivity related characteristics). Wink identified two distinct types of narcissism: one more adaptive form of narcissism which is associated with grandiosity and exhibitionism, and one more maladaptive form of narcissism which is associated with vulnerability and sensitivity. What unites both forms as being narcissistic are the core traits of narcissism that each of them shares: being extremely conceited and self-absorbed, as well as having a disregard for other people.

Wink (1991) named the grandiosity-exhibitionism type as “overt narcissism” and the vulnerability-sensitivity narcissism as “covert narcissism.” However, subsequent researchers have given a variety of names to each different type. The grandiosity-exhibitionism type has previously been referred to as grandiose narcissism and oblivious narcissism, and the vulnerability-sensitivity type has been called hypersensitive narcissism, vulnerable narcissism, hypervigilant narcissism, and closet narcissism (Besser & Priel 2010; Dickinson & Pincus 2003). In this thesis, I will use the terms *grandiose narcissism* and *hypersensitive narcissism*.

***Grandiose Narcissism***

People who are high in grandiose narcissism are often what people think of when they think of the “typical narcissist.” They come across as very self-assured, extraverted, and confident in themselves and their abilities, which they believe to be superior to those around them (e.g., Atlas & Them, 2008; Miller et al., 2012; Rose, 2002; Wink, 1991). Additionally, they often have a false sense of entitlement and are preoccupied with thoughts of grandeur. A key tendency of people high in grandiose narcissism is to seek admiration from others. Although they strive to be admired by their peers, they tend to not be negatively affected when they do not get approval from others (Morf & Rhodewalt, 2001; Zeigler-Hill et al., 2008). People high in grandiose narcissism also have the core features of narcissism, including being arrogant, conceited, exploitative, and non-empathetic (Wink, 1991).

***Hypersensitive Narcissism***

People high in hypersensitive narcissism also have the defining characteristics of narcissism, although their narcissism can go unnoticed by others for not fitting the “narcissistic stereotype” (Wink, 1991). Unlike people high in grandiose narcissism, those high in hypersensitive narcissism are often introverted, neurotic, and highly sensitive to even slight criticism (e.g., Atlas & Them, 2008; Miller et al., 2012; Wink, 1991). Like those high in grandiose narcissism, people high in hypersensitive narcissism seek admiration from others, although they use that admiration from other people to maintain their positive self-esteem (Zeigler-Hill et al., 2008). When they do not receive admiration to validate their self-concept, they can then experience declines in their well-being. Similar to their grandiose counterparts, people high in hypersensitive narcissism share the core features of narcissism

(e.g., being arrogant, conceited, exploitative, and non-empathetic; Wink, 1991). Overall, there is much less research on hypersensitive narcissism than grandiose narcissism.

### **Narcissism and a Positive Self-Concept**

As noted earlier, one of the core features of narcissism is having an overly positive self-concept—i.e., they are arrogant. Numerous studies have examined the link between people's level of narcissism and their view of themselves. For example, Bleske-Rechek et al. (2008) found that people higher in grandiose narcissism tended to think they were more attractive than most other people while people lower in grandiose narcissism did not. Additionally, people higher in grandiose narcissism think of themselves as more intelligent than other people (Campbell et al., 2002).

People high in either type of narcissism maintain their self-esteem in different ways. As mentioned, people high in hypersensitive narcissism seek admiration from others, and in turn they use other people's opinions of themselves to validate their positive self-concept and maintain their self-esteem (Zeigler-Hill et al., 2008). Although people high in grandiose narcissism also seek admiration from other people, they do not use that admiration to maintain their self-esteem (Morf & Rhodewalt, 2001; Zeigler-Hill et al., 2008). Instead, they rely on themselves to uphold their grandiose self-perceptions.

One strategy people use to maintain a positive self-esteem is *self-enhancement*, or thinking of the self more positively than one objectively should (Alicke & Sedikides, 2011). People high in grandiose narcissism, sometimes referred to as “chronic self-enhancers” (Rose, 2002, p. 380) or the “self-enhancer personality” (Morf et al., 2011, p. 399), tend to self-enhance more than people low in grandiose narcissism (Grijalva & Zhang, 2016). So, while most people self-enhance to maintain a relatively positive self-esteem, people high in

grandiose narcissism do so to maintain their grandiose sense of self. Back et al. (2013) also emphasized the tendency for people high in grandiose narcissism to self-enhance to build their social relationships. There is little research on self-enhancement and hypersensitive narcissism, but so far it suggests that people high in hypersensitive narcissism do not rely upon self-enhancement strategies (Kealy et al., 2017).

A common method of self-enhancement is using self-serving attributions. One self-serving attribution is taking a disproportionately greater amount of credit for successes than other people who also contributed to that success. Campbell et al. (2000) investigated how grandiose narcissism related to self-serving attributions. In their study, the researchers had participants complete a creativity task and told them that their assigned partner would also complete the task. Additionally, they were told that the score they would receive on the task was the total score between both them and their partner's efforts. In reality, there was no partner and participants were assigned feedback. When the participants were told they scored in the 93<sup>rd</sup> percentile on the creativity task, people higher in grandiose narcissism took more responsibility for the success than people lower in grandiose narcissism.

Selle et al. (2019) also measured self-serving attributions and grandiose narcissism. The researchers had participants read a vignette about winning a team-based game with a large monetary prize and imagine themselves in that situation. The participants then reported what percentage of the win was due to their own efforts as opposed to their partner and how much of the prize money them and their partner were each entitled to keep. Overall, people higher in grandiose narcissism took more credit for the win and more of the prize money than their less narcissistic counterparts.

Another way people might engage in self-enhancement is by assuming that positive feedback about themselves is very accurate. Kernis and Sun (1994) examined this type of self-enhancement as it relates to narcissism. Specifically, after completing a measure of grandiose narcissism, participants read aloud a speech and received positive feedback regarding their social skills. Kernis and Sun found that higher grandiose narcissism was associated with considering the evaluation to be a more diagnostic measure of their social skills. Additionally, participants higher in grandiose narcissism thought of the evaluator as a more competent judge of their social skills. In sum, higher grandiose narcissism was associated with more self-enhancement.

### *Narcissism and Unrealistically Positive Views*

Notably, the self-enhancement of people high in grandiose narcissism is often not corroborated by reality. As noted earlier, people higher in grandiose narcissism rated themselves to be more attractive than people lower in grandiose narcissism; however, narcissism was not correlated with attractiveness when rated by others (Bleske-Rechek et al., 2008; Gabriel et al., 1994). John and Robins (1994) investigated how realistically people rated their own performance ability. The researchers had masters of business administration students rate their performance on a managerial group-discussion task. Staff and peer evaluations were collected as well, and those evaluations were compared to the students' self-evaluations. Overall, there was a strong tendency for people higher in grandiose narcissism to overestimate how well they did on the task. Paulhus (1998) also compared self-ratings and observer-ratings for how well people performed in group discussions over seven sessions. Although people higher in grandiose narcissism did make a better impression at the



first meeting, as the meetings progressed their self-ratings of performance were higher than their observer ratings.

In another study examining the accuracy of people's perceptions, Farwell and Wohlwend-Lloyd (1998) studied people's perceptions of their intelligence—particularly, if grandiose narcissism was associated with greater intelligence. In their study, people made predictions about their performance in an undergraduate college course at the beginning of the semester. Afterwards, Farwell and Wohlwend-Lloyd compared participants' predictions to the actual final grades they received. People higher in grandiose narcissism tended to predict that they would do better in the course than people lower in grandiose narcissism, however, they did not actually receive better grades. Thus, people high in grandiose narcissism were *overly optimistic* about how well they would do in the course.

Campbell et al. (2004) assessed how grandiose narcissism was related to both predictions for a knowledge-based betting task and actual performance on the task. Again, people higher in grandiose narcissism predicted better performances on the task. However, narcissism was actually associated with earning fewer points on the task, suggesting that the optimism of people higher in grandiose narcissism was unwarranted. It is worth noting that the relationship between general optimism and narcissism seems to depend on the type of narcissism being assessed. Although grandiose narcissism appears to be positively related to optimism, Kealy et al. (2017) discovered that hypersensitive narcissism was related to being more generally pessimistic about the future.

### ***Comparative Optimism***

A construct closely related to general optimism—and the focus of the current study—is *comparative optimism* (sometimes also called *unrealistic optimism*). Comparative

optimism occurs when people think that desirable events are *more* likely to happen to them than their peers and undesirable events are *less* likely to happen to them than their peers (Weinstein, 1980). Although it is difficult to tell whether any specific individual is unrealistic in their likelihood judgments, assessing optimism at a group level can reveal when people are being optimistic, realistic, or pessimistic (Shepperd et al., 2017; Weinstein, 1980). This is because on the group level people should, on average, be rating events as about as likely to happen to them as their peers if they are realistic in their likelihood judgments. However, people tend to be more optimistic overall (Weinstein, 1980). It is important to note that people may not exhibit comparative optimism in all situations, nor do all types of people exhibit comparative optimism (Chambers et al., 2003; Harris et al., 2008; Klein & Helweg-Larsen, 2002; Kruger & Burrus, 2004; Price et al., 2002). For example, people tend to not exhibit comparative optimism for very uncommon desirable events (e.g., having your work recognized with a Nobel Prize) and very common undesirable events (e.g., getting a ticket for driving too fast; Kruger & Burrus, 2004). Similarly, people who are more anxious or who have lower self-esteem often do not exhibit comparative optimism (Harris et al., 2008).

There are a few explanations for why people exhibit comparative optimism. One reason is that being overly optimistic can help maintain a person's positive self-esteem (Taylor & Brown, 1988). Intuitively, it makes sense that thinking optimistically about the future would help people maintain a positive self-esteem. This idea is supported through the literature as well, with higher comparative optimism being related to higher self-esteem (e.g., Harris et al., 2008; Hoorens, 1995; Taylor & Brown, 1988). People may also engage in certain cognitive biases that can serve to maintain a positive self-esteem. One is the *better-than-average heuristic*, in which people automatically tend to assume they are better than the

average person (Alicke et al., 1995). Price et al. (2002) suggested that this heuristic is used in comparative optimism judgments, with people anchoring their likelihood judgements to the midpoint of the scale, or how likely the average person is to experience the event, and then shifting their judgment from there to give themselves a more favorable likelihood of experiencing the event.

Another possible reason that people are overly optimistic when making comparative likelihood judgments is that people typically focus on themselves more than others—that is, they are *egocentric* (Chambers & Windschitl, 2004). People have more information about themselves than other people, so it is likely that they will give information about their own probabilities more weight when making comparative likelihood judgments than they would about the probabilities of their peers (Chambers et al., 2003; Kruger & Burrus, 2004). For example, imagine that you were asked to estimate the likelihood that you will go blind as compared to your peers. You might first think about how this event is relatively unlikely to happen to you, and then assume that it must be less likely to happen to you as compared to your peers. However, you may fail to consider that other people are also unlikely to go blind. This failure to properly weight the probability that your peers will experience an event can result in the tendency for people to display comparative optimism.

**Narcissism and Comparative Optimism.** A couple of studies have assessed grandiose narcissism and comparative optimism. Jonason et al. (2018) measured both grandiose narcissism and comparative optimism, and found that people higher in grandiose narcissism were more comparatively optimistic than people lower in grandiose narcissism. Tamborski et al. (2012) also measured grandiose narcissism and comparative optimism for desirable and undesirable events. The researchers found that, overall, grandiose narcissism

was related to higher comparative optimism. However, this effect was largely driven by comparative optimism for desirable events: grandiose narcissism was positively related to comparative optimism for desirable events but unrelated to comparative optimism for undesirable events.

Unlike grandiose narcissism, the relationship between hypersensitive narcissism and comparative optimism is less clear; there are currently no published studies examining this association. As noted earlier, people higher in hypersensitive narcissism seem to be less generally optimistic, suggesting there might also be a negative relationship between hypersensitive narcissism and comparative optimism (Kealy et al., 2017). However, given the lack of empirical evidence and that comparative and general optimism are distinct constructs, the relationship between comparative optimism and hypersensitive narcissism is currently unknown.

### **Threatening the Self-Concept**

A primary concern of the current study was to understand how people high in both types of narcissism react to a threat of their self-concept. Given that people high in narcissism have unrealistically positive self-concepts, it is important to understand how they react to evidence contrary to their beliefs. Any feedback that challenges their inflated self-esteem can potentially have more detrimental effects for people higher in narcissism than people with more negative self-esteem because there is “more to lose” (for a review, see Stucke & Sporer, 2002).

As mentioned, people higher in grandiose narcissism tend to make more self-serving attributions than people lower in grandiose narcissism. In addition to taking more credit for successes, another self-serving attribution is taking disproportionately less credit for failures

than other people who also contributed to that failure. Taking less credit for failure can serve a self-protective role because it defends a person against negative feedback that may harm their self-concept. In a study described above, Campbell et al. (2000) studied how people higher and lower in grandiose narcissism took responsibility for the outcome of a partnered creativity task when given success feedback. However, not all participants received success feedback—some were assigned to a failure feedback condition instead. When assigned the failure feedback of scoring in the 31<sup>st</sup> percentile, people higher in grandiose narcissism took less credit for the failure than people lower in grandiose narcissism.

One other self-protective behavior that people high in grandiose narcissism have been found to use is invalidating negative feedback (Grijalva & Zhang, 2016). When someone or something threatens a person high in narcissism's self-concept (i.e., the belief that they are superior to others), they may in turn criticize the source of this negative feedback, leading to a disregard for the feedback they received. As described previously, Kernis and Sun (1994) investigated how people higher and lower in grandiose narcissism reacted to positive versus negative feedback. Compared to those lower in grandiose narcissism, participants higher in grandiose narcissism considered the negative feedback evaluation to be less diagnostic of their social skills and thought of the evaluator as a less competent judge.

The above studies examined how grandiose narcissism is related to perceptions of negative feedback, but not outcomes associated with that negative feedback. A majority of the research on outcomes related to narcissism and threat to the self-concept focuses on externalizing behaviors, like how grandiose narcissism relates to anger and aggression (e.g., Bushman & Baumeister, 1998; Bushman et al., 2009). Not as much research has investigated how people high in narcissism internalize negative feedback. Based on the previous research

that people high in grandiose narcissism engage in self-enhancement and self-protection strategies, they may be more resilient to a threat of their self-concept than people low in grandiose narcissism. On the other hand, people high in hypersensitive narcissism are theorized to be more sensitive to failure (Hendin & Cheek, 1997; Wink, 1991). The studies that have empirically investigated this idea have found conflicting evidence for how people high in either type of narcissism internalize negative feedback, which highlights the need for more research on this topic.

There are a couple studies whose findings support the idea that people high in grandiose narcissism are more resilient to negative feedback. This aligns with the idea that people high in grandiose narcissism engage in self-enhancing and self-protecting behaviors to maintain a positive self-esteem in the face of criticism. Rhodewalt and Morf (1998) measured grandiose narcissism (but not hypersensitive narcissism) with their threat manipulation on an intelligence test that participants took in two sets. Half of the participants received success feedback (scoring in the 80<sup>th</sup> percentile) on the first set and failure feedback (scoring in the 30<sup>th</sup> percentile) on the second set, whereas the other half received failure feedback on the first set and success feedback on the second set. Overall, participants high in grandiose narcissism experienced a greater decrease in anxiety and depressive symptoms relative to those low in grandiose narcissism in the failure followed by success condition. In the success followed by failure condition, participants high in grandiose narcissism experienced less of an increase in anxiety and depressive symptoms relative to those low in grandiose narcissism. These findings suggest that people high in grandiose narcissism may selectively utilize success feedback to improve their mood, yet remain more resilient when receiving failure feedback.

Hart et al. (2017) investigated both types of narcissism using threatening scenarios. In their study, participants read either one of the three low provocation vignettes (made to be relatively neutral) or one of the three high provocation vignettes (made to threaten the participants' self-concept). For example, participants who read a high provocation vignette were asked to imagine being insulted by a teammate. Afterwards, participants rated their emotional reaction to the event they read. Overall, higher grandiose narcissism was associated with less sadness and hurt feelings. None of the emotions significantly differed in the interaction between grandiose narcissism and threat, supporting the idea that people higher in grandiose narcissism are more resilient to threats to their self-concept. Although hypersensitive narcissism was associated with more sadness and hurt feelings overall, there again was not an interaction between hypersensitive narcissism and threat condition in regard to negative affect. This finding does not support the idea that people high in hypersensitive narcissism are more sensitive to threatening scenarios.

Studying both types of narcissism, Atlas and Them (2008) investigated how each related to sensitivity to criticism. The researchers found that grandiose narcissism negatively related to the sensitivity to criticism measure, but hypersensitive narcissism was related to greater sensitivity to criticism. Atlas and Them also evaluated people's actual response to negative feedback. In their study, participants gave a speech that they were told would be evaluated by two judges. However, the participants were actually randomly assigned false feedback. The first condition received two negative evaluations, the second condition received one negative and one positive evaluation, and the third condition received two positive evaluations. To assess how participants internalized the negative feedback, they filled out an affect measure designed to assess internalized negative feelings. Grandiose

narcissism related to lower levels of internalized negative feelings across the two-positive evaluations and two-negative evaluations conditions, but higher internalized negative feelings in the mixed condition. On the other hand, hypersensitive narcissism was associated with more internalized negative feelings, but this association did not differ across conditions. So, those high in hypersensitive narcissism experienced no change in their internalized negative emotions across conditions, despite Atlas and Them finding that hypersensitive narcissism was associated with more sensitivity to criticism.

Contrary to the research above, one study found that grandiose narcissism was associated with being more affected by negative feedback than hypersensitive narcissism. Besser and Priel (2010) measured both grandiose and hypersensitive narcissism and assigned participants to either a threat or non-threat condition for achievement failure. In the threat to achievement condition, participants were asked to imagine either a high-level threat scenario about seeing someone else congratulated on the job promotion they were anticipating to receive, or a low-level threat scenario about seeing someone else congratulated on their retirement. In the threatened condition, people high in grandiose narcissism had higher negative affect scores than people lower in grandiose narcissism while controlling for baseline states of negative affect and neuroticism. This finding is somewhat surprising because it contradicts the notion that people high in grandiose narcissism are engaging in self-protective behaviors when their self-concept is threatened. One possible reason for this difference was that Besser and Priel only reported the results for the Entitlement/Exploitation subscale of the Narcissistic Personality Inventory, which is considered to be the more maladaptive part of grandiose narcissism (e.g., Ackerman et al., 2011). Unlike grandiose narcissism, hypersensitive narcissism was not associated with an increase in negative



affectivity in the threatened condition when controlling for baseline negative affectivity and neuroticism scores. Again, this finding contradicts previous research suggesting that hypersensitive narcissism is more sensitive to failure (Hendin & Cheek, 1997; Wink, 1991).

Malkin et al. (2011) investigated how hypersensitive narcissism was related to anxiety and shame after a threat to the self-concept. Adolescents took a general knowledge test and were randomly assigned to receive either positive feedback (i.e., “You did much better than people other people your age, Great Job!”), neutral feedback (i.e., no indication of performance given), or negative feedback (i.e., “You did worse than everyone else your age. We are very disappointed in you!”). Overall, people in the positive feedback condition experienced more shame than those in the other conditions, with people higher in hypersensitive narcissism in the positive feedback condition experiencing the most shame. Malkin et al. explained this finding by suggesting that people higher in hypersensitive narcissism may feel more pressure to maintain their positive self-image after receiving positive feedback. Hypersensitive narcissism was not related to higher levels of shame in the neutral or negative feedback conditions. There was no interaction between hypersensitive narcissism, feedback condition, and anxiety. The findings of Malkin et al. add to the mixed research between narcissism, threat to the self-concept, and internalizing factors.

### ***Threat to the Self-Concept and Comparative Optimism***

The research between narcissism, threat to the self-concept, and comparative optimism is quite limited. To my knowledge, there are currently no studies assessing how comparative optimism changes for people high in either type of narcissism when threatened.

Irrespective of narcissism, optimism biases can be persistent in the face of adversity. Sharot et al. (2011) studied how people update their likelihood judgments of experiencing

negative events when given average probability information about people similar to them. This information either supported or challenged their optimistic beliefs. When the information was desirable and supported their optimistic beliefs, people were likely to update their initial judgments to be more optimistic. However, when the information was undesirable and challenged their optimistic beliefs, people were less likely to update their initial judgments. Other studies have found that comparative optimism can change based on situational factors (Lerner & Keltner, 2001; Rose et al., 2012; Windschitl et al., 2003). For example, as people get more experience with a task, they tend to be less optimistic about their likelihood of doing better on that task compared to a competitor (Rose et al., 2012).

Engaging in self-enhancement, including comparative optimism, has consistently been associated with greater well-being (Dufner et al., 2019; Taylor & Brown, 1988; but see Schimmack & Kim, 2020). Another potential benefit of being optimistic is that it could help in motivating people to achieve their goals. For example, Taylor and Brown (1988) found that people who think that they are much more likely to receive an upcoming promotion than their coworkers may work more towards that goal, and in return, actually receive the promotion. This scenario illustrates how an increase in optimism may relate to increased productivity because it enables a person to be more determined and motivated to pursue their goals.

Despite the potential benefits, being overly optimistic is also related to more detrimental outcomes. Notably, being overoptimistic about experiencing an undesirable event (e.g., developing cancer, experiencing natural disaster) is linked to how likely they are to take the proper precautions in the case that the event does occur (Davidson & Prkachin, 1997; Kunreuther, 1996; Stuart et al., 2017). For example, someone who underestimates their

likelihood of being laid off during a company downsizing may be less likely to update their résumé and start looking for a new job. Additionally, overestimating the probability of experiencing a desirable event and not meeting that expectation is associated with greater disappointment than having had a more realistic outlook in the first place (Shepperd & McNulty, 2002).

Overall, being overly optimistic may be beneficial in the short-term, but could have more long-term negative consequences. Given the implications associated with unrealistic optimism, it is important to understand whether people change their likelihood judgments in the face of negative feedback, and if there are certain individual differences like type of narcissism which may be related to how optimistic people are after receiving negative feedback.

### **Current Study**

The current study measured both grandiose and hypersensitive narcissism to investigate how they relate to comparative optimism. I also implemented a threat manipulation to see how comparative optimism changes for people higher in grandiose and hypersensitive narcissism compared to people lower in narcissism. Examining how both types of narcissism are related to a threat to the self-concept is important given the contradictory findings described above. Furthermore, no published studies have examined how hypersensitive narcissism relates to comparative optimism, nor have any studies investigated whether narcissism moderates the relationship between threat to the self-concept and comparative optimism. Therefore, in addition to helping clarify the relationship between narcissism and threat, this study also served to fill a gap in the literature.

After measuring participants' levels of narcissism, participants completed a problem-solving task. The participants were told that performance on this problem-solving task is related to future success in careers, relationships, and health. After going through the problem-solving task, some participants were given neutral feedback while other participants received negative feedback. Finally, I assessed comparative optimism by having participants indicate their likelihood of experiencing numerous future life events as compared to their peers.

### *Hypothesis 1*

My first prediction was that participants in the negative feedback condition would have lower comparative optimism than those in the neutral feedback condition. Because participants were told the problem-solving test relates to the likelihood of experiencing future events, I expected people in the negative feedback condition to internalize the negative feedback and thus have lower comparative optimism scores.

### *Hypothesis 2*

My second prediction was that as grandiose narcissism increases, comparative optimism would increase. People high in grandiose narcissism have an inflated sense of self and, as discussed, engage in self-enhancement strategies to maintain their elevated self-esteem (e.g., Back et al., 2013; Grijalva & Zhang, 2016). Needing to maintain their inflated self-esteem is likely to motivate them to be more optimistic than people low in grandiose narcissism. Additionally, people higher in grandiose narcissism tend to be more egocentric than people lower in grandiose narcissism, so they may even give a more disproportionate amount of weight to their own probabilities of experiencing a certain event than the probabilities of others (Lachowicz-Tabaczek et al., 2019). Lastly, it is also possible that their

feelings of superiority could play a role in their comparative likelihood judgments, making them much more optimistic about their likelihood of experiencing future events compared to their peers (Krizan & Bushman, 2011).

### ***Hypothesis 3***

My third prediction was that there would be a negative relationship between hypersensitive narcissism and comparative optimism. As mentioned earlier, Kealy et al. (2017) found that hypersensitive narcissism was related to less general optimism. Also, people high in hypersensitive narcissism typically do not engage in self-enhancing and self-protective behaviors to maintain their inflated self-esteem (Grijalva & Zhang, 2016; Rose, 2002). Like their grandiose counterparts, those higher in hypersensitive narcissism tend to be very egocentric (Lachowicz-Tabaczek et al., 2019). However, because people higher in hypersensitive narcissism tend to have a more pessimistic outlook on their future, thinking more about their likelihood of experiencing future events compared to others may make them more comparatively pessimistic. Therefore, it seemed likely that people higher in hypersensitive narcissism would also be pessimistic in their comparative likelihood judgments.

### ***Hypothesis 4***

My fourth hypothesis was that there would be an interaction between threat and grandiose narcissism on comparative optimism. Specifically, I predicted that people higher in grandiose narcissism would be more resilient to the threat of their self-concept, meaning that the optimism of those higher in grandiose narcissism would be less affected by the threat manipulation than those lower in grandiose narcissism. Previous studies have found mixed results for whether people higher in grandiose narcissism are more affected (Besser & Priel,

2010) or less affected (Atlas & Them, 2008; Hart et al., 2017; Rhodewalt & Morf, 1998) by threats to the self-concept. Although Besser and Priel (2010) found that people higher in grandiose narcissism were more affected by a threat, they focused their analysis on a subscale of the Narcissistic Personality Inventory. The studies finding that people higher in grandiose narcissism were less affected examined the entire scale. I focused on the entire scale, so I expected that people higher in grandiose narcissism would engage in self-protective behaviors to maintain their inflated self-esteem, thus being more resilient to the negative feedback.

### ***Hypothesis 5***

My fifth prediction was that there would be an interaction between threat and hypersensitive narcissism on comparative optimism. Specifically, I predicted that the optimism of people higher in hypersensitive narcissism would be more affected by the threat manipulation than those lower in hypersensitive narcissism. It is theorized that people high in hypersensitive narcissism are more sensitive to negative feedback (Hendin & Cheek, 1997; Wink, 1991). Additionally, Atlas and Them (2008) found that higher sensitive narcissism was associated with being more sensitive to criticism. However, when Atlas and Them actually manipulated feedback, negative affect did not significantly differ across conditions. This was also found in other threat manipulation studies that measured hypersensitive narcissism (Besser & Priel, 2010; Hart et al., 2017).

### **Method**

This study was preregistered (<https://osf.io/bymzx>) and all materials and data are available on the Open Science Framework (<https://osf.io/6ang8/>).

## **Participants**

Participants were recruited through the Appalachian State University Psychology Subject Pool. Undergraduate students in the participant pool who were at least 18 years of age were eligible to participate in the current study. The target sample size was 300 participants based on a pilot study and practical limitations. A total of 284 participants were recruited for the study. In exchange for their participation, the students were granted two Experiential Learning Credits (ELCs) to satisfy part of their course requirement. Sixty-two participants were excluded based on my preregistered exclusion criteria of not passing all three attention checks embedded in the scales (e.g., for this question, please select “5”) or for not accurately remembering the score they received on the problem-solving test. This left a total of 222 participants in the study ( $M_{\text{age}} = 19.67$ ,  $SD_{\text{age}} = 2.21$ ). Of those participants, 73.9% were women, 23.4% were men, 1.4% were non-binary, and 1.4% preferred not to answer. Eighty-five percent of the participants identified as white.

## **Measures**

### ***Grandiose Narcissism***

The Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979, 1981) was used to assess grandiose narcissism. The version that was used in the current study was the 40-item scale developed by Raskin and Terry (1988), which consists of force-choice formatted questions with one narcissistic option (e.g., “I am an extraordinary person”) and one non-narcissistic option (e.g., “I am much like everybody else”). The NPI comprises of the following factors: authority, self-sufficiency, superiority, exhibitionism, exploitativeness, vanity, and entitlement. For the purposes of my study, I focused on participants’ average NPI score. Higher scores on the NPI (ranging from 0 to 1) indicated greater grandiose narcissism.

The NPI is widely used in the literature to assess grandiose narcissism and has been well-validated with high reliability ( $\alpha = .83$  in the current study). For the complete list of questions and scoring for the NPI, see Appendix A.

### ***Hypersensitive Narcissism***

The Hypersensitive Narcissism Scale (HSNS; Hendin & Cheek, 1997) is a 10-item scale that was used to assess hypersensitive narcissism. Each item (e.g., “I dislike being with a group unless I know that I am appreciated by at least one of those present”) was ranked on a scale from *very uncharacteristic* (1) to *very characteristic* (5). Higher average scores on the HSNS (ranging from 1 to 5) indicated greater hypersensitive narcissism. The scale had decent reliability ( $\alpha = .66$ ), which is consistent with previous research ( $\alpha$  ranging from .62 to .79). For the complete list of questions and scoring for the HSNS, see Appendix B.

### ***Problem-Solving Ability***

Participants were asked a series of Analytical Reasoning questions pulled from a practice exam for the Law School Admission Test (LSAT; “Analytical Reasoning Sample Questions,” n.d.). Actual performance on the test was not assessed in the study; instead all participants were randomly assigned feedback on the test to either threaten or not threaten their self-concept. For an example question, see Appendix C.

### ***Comparative Optimism***

Future life events adapted from previous research were used in the study (Chambers et al., 2003; Dunning & Story, 1991; Price et al., 2002; Weinstein, 1980). Events were chosen from a pool of 104 events, which were informally pilot tested to assess for controllability, frequency, and desirability. Because optimism judgments differ depending on level of controllability and frequency, the 36 events chosen had varying levels of



controllability and frequency (e.g., Harris et al., 2008). Participants saw 18 desirable events (e.g., have your work recognized with an award) and 18 undesirable events (e.g., be fired from a job). Participants were told to “Please indicate the likelihood that each of the following events will happen to you compared to other Appalachian State students of the same age and gender.” Events were judged on a comparative scale ranging from *much less likely to happen to me* (1) to *much more likely to happen to me* (7), with the midpoint being *about as likely to happen to me* (4). Being optimistic indicated that people thought the desirable events were more likely to happen to them and the undesirable events were less likely to happen to them as compared to their peers. Optimism ratings for undesirable events were reversed-scored, with higher average scores (ranging from 1 to 7) indicating greater comparative optimism for all optimism measures. The comparative optimism scale used in the study had good reliability ( $\alpha = .75$ ). For the complete list of events and scoring of comparative optimism, see Appendix D.

### **Exploratory Measures**

#### ***Self-Esteem***

The Rosenberg Self-Esteem Scale was used in exploratory analyses as a control variable (RSES; Rosenberg, 1965). The RSES consists of 10 items (e.g., “I feel I am a person of worth, at least on an equal basis with others”) with a 4-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). Higher average scores on the RSES (ranging from 1 to 5) indicated higher self-esteem. The RSES has been shown to be a reliable and valid measure of self-esteem ( $\alpha = .89$ ). For the complete list of questions and scoring of the RSES, see Appendix F.

### *Negative Affect*

I used the negative affect items from the Positive and Negative Affect Scale (PANAS) to assess internalized negative emotions (Watson et al., 1988). Participants were asked to what extent they currently feel for the 10 words related to negative affect (e.g., distressed, hostile). Participants indicated their ratings on a scale from *very slightly* to *not at all* (1) to *extremely* (5). Higher average scores (ranging from 1 to 5) indicated higher feelings of negative affect. The negative affect part of the PANAS has been shown to be a reliable and valid measure of negative affect ( $\alpha = .92$ ). For the complete list of words and scoring, see Appendix E.

### **Procedure**

After selecting the online study in SONA, participants read through an informed consent document (see Appendix G) outlining the purpose of the study, the potential risks of participation, and their rights as a participant. The participants were also be provided the contact information for the principal investigator, the Institutional Review Board (IRB), and the university counseling center. They received 2 ELCs in exchange for their participation in the study. After participants read the informed consent document and agreed to participate, they continued to the rest of the online survey through Qualtrics.

At the beginning of the survey, participants were told that they will be presented with a series of measures designed to assess their personality. They then filled out the NPI and HSNS to assess grandiose and hypersensitive narcissism, respectively, followed by the RSES to assess self-esteem.

Next, participants were told that they will be completing a “Problem-Solving Test,” which consisted of analytical reasoning questions from the LSAT. Before beginning the test,

participants read a prompt informing them that problem-solving ability is a strong predictor of future success, with higher scores on the problem-solving test being associated with better outcomes in regard to their career, relationships, and health (for full prompt, see Appendix H). After completing the test, participants were randomly assigned to receive either neutral or negative feedback regarding their performance. In the neutral feedback condition, participants saw this passage: *You scored a 340 on problem-solving ability.* The numerical value was chosen with the intention of making the participants' performance ambiguous to maintain a neutral effect. In the negative feedback condition, participants saw this passage: *You scored a 340 on problem-solving ability. This score indicates that you scored much lower on problem-solving ability than most other Appalachian State students.* Unlike the neutral feedback condition, the number in the negative feedback condition was given meaning through its comparison to the scores of the participants' peers.

After receiving the false feedback, all participants were informed that they would then be asked questions about how they perceive themselves. They started by making judgments about the likelihood that they will experience certain desirable and undesirable events in comparison to their peers in order to measure their comparative optimism. Afterwards, they filled out the negative affect part of the PANAS. The participants then answered a series of demographic questions assessing their age, gender, and ethnicity. Next, participants were asked to recall the score they received on the problem-solving task as an attention check. The participants in the negative feedback condition were also asked to recall how they scored in relation to other Appalachian State students. Afterwards, all participants were asked their thoughts on the importance of problem-solving as well as their perception of the problem-solving test and feedback used in the study (for full list of questions, see

Appendix I). Finally, participants were fully debriefed on the study and made aware that their problem-solving ability was never actually assessed and the feedback they received was false (for full prompt, see Appendix J).

## **Results**

### **Preliminary Analyses**

As noted earlier, participants who did not accurately answer all three attention check items or who did not remember their score on the problem-solving test were excluded from the following analyses. Before testing my hypotheses, I ran a series of correlations between the variables measured in the study. I will highlight some of the notable relationships below (see Table 1 for all bivariate correlations between variables). Consistent with previous research using the Narcissistic Personality Inventory (NPI) and Hypersensitive Narcissism Scale (HSNS) to assess the two types of narcissism, grandiose and hypersensitive narcissism were not significantly correlated with one another. Grandiose narcissism was positively correlated with participants' composite optimism score; however, this relationship was driven by the relationship between grandiose narcissism and participants' optimism for desirable events, as grandiose narcissism was not correlated with optimism for undesirable events. Conversely, hypersensitive narcissism was associated with less optimism overall, but this association occurred mainly because of the relationship between hypersensitive narcissism and participants' optimism for undesirable events. Hypersensitive narcissism was not significantly related to optimism for desirable events.

Although not of primary interest to the current study, I also examined the relationships between self-esteem, gender, negative affect, and the primary measures (see Table 1 again). Self-esteem was correlated positively with grandiose narcissism and

**Table 1**

*Correlations Among Grandiose Narcissism, Hypersensitive Narcissism, Self-Esteem, Comparative Optimism (Including Desirable and Undesirable Events), Negative Affect, Age, and Gender*

|                | M (SD)       | 1      | 2       | 3       | 4       | 5      | 6      | 7    | 8   |
|----------------|--------------|--------|---------|---------|---------|--------|--------|------|-----|
| 1. NPI         | 0.37 (.16)   | -      |         |         |         |        |        |      |     |
| 2. HSNS        | 3.03 (.54)   | .09    | -       |         |         |        |        |      |     |
| 3. RSES        | 3.32 (.70)   | .31*** | -.35*** | -       |         |        |        |      |     |
| 4. Optimism    | 4.19 (.47)   | .24*** | -.22**  | .49***  | -       |        |        |      |     |
| 5. Desirable   | 3.74 (.72)   | .27*** | -.11    | .32***  | .70***  | -      |        |      |     |
| 6. Undesirable | 4.65 (.68)   | .05    | -.19**  | .33***  | .65***  | -.10   | -      |      |     |
| 7. NA          | 2.02 (.91)   | -.14*  | .38***  | -.57*** | -.28*** | -.18** | -.19** | -    |     |
| 8. Age         | 19.67 (2.21) | -.10   | -.04    | -.15*   | -.00    | .02    | -.03   | .12  | -   |
| 9. Gender      | -            | -.11   | .16*    | -.09    | -.14*   | -.10   | -.08   | .15* | .07 |

*Note.* NPI = Narcissistic Personality Inventory, HSNS = Hypersensitive Narcissism Scale, RSES = Rosenberg Self-Esteem Scale, Optimism = composite optimism, Desirable = optimism for desirable events, Undesirable = optimism for undesirable events, NA = negative affect items from the PANAS. Gender was coded as 1 for men and 2 for women. For all correlations with gender, only men and women were included.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

negatively with hypersensitive narcissism. Women scored higher than men in hypersensitive narcissism and negative affect, but had lower optimism scores than men. Finally, higher grandiose narcissism was associated with lower negative affect, whereas higher hypersensitive narcissism was related to higher negative affect.

### **Main Analysis**

To test my hypotheses, I ran a regression analysis to investigate how grandiose narcissism scores, hypersensitive narcissism scores, and feedback condition predicted participants' comparative optimism scores. Participants' comparative optimism scores were the average optimism score for both the desirable and undesirable events (with undesirable

event scores reverse-coded). All three predictors were grand mean-centered before being added into the regression simultaneously. In addition to the three predictors, I also simultaneously included the grandiose narcissism X feedback condition interaction and hypersensitive narcissism X feedback condition interaction in the model.

The regression analysis revealed that participants' feedback condition was not a significant predictor of their optimism scores (see Table 2 for statistics for all predictors and the overall model). This finding did not support my prediction that participants in the negative feedback condition would have lower optimism than those in the neutral feedback condition. Instead, participants' optimism was not affected by the feedback they received on the problem-solving test.

To test my second and third hypotheses, I analyzed the main effects of each type of narcissism predicting comparative optimism. In support of my second hypothesis, grandiose narcissism predicted higher comparative optimism. My third hypothesis was supported as well; higher hypersensitive narcissism predicted less comparative optimism.

**Table 2**

*Regression Analysis Predicting Comparative Optimism from Grandiose Narcissism, Hypersensitive Narcissism, and Feedback Condition*

|  | <i>B</i>              | <i>SE B</i> | $\beta$              | <i>t</i>     | <i>p</i>         |
|--|-----------------------|-------------|----------------------|--------------|------------------|
| <b>Grandiose Narcissism</b>                    | <b>.88</b>            | <b>.26</b>  | <b>.31</b>           | <b>3.46</b>  | <b>&lt; .001</b> |
| <b>Hypersensitive Narcissism</b>               | <b>-.25</b>           | <b>.08</b>  | <b>-.29</b>          | <b>-3.16</b> | <b>.002</b>      |
| Feedback Condition                             | .08                   | .06         | .17                  | 1.34         | .182             |
| Grandiose Narcissism * Feedback Condition      | -.36                  | .37         | -.13                 | -.97         | .332             |
| Hypersensitive Narcissism * Feedback Condition | .10                   | .11         | .12                  | .93          | .354             |
|  | <i>R</i> <sup>2</sup> |             | <i>F(df)</i>         |              | <i>p</i>         |
| <b>Model Summary</b>                           | <b>.13</b>            |             | <b>6.32 (5, 216)</b> |              | <b>&lt; .001</b> |

There was not a significant interaction between grandiose narcissism and feedback condition for predicting comparative optimism. This does not support my prediction that participants higher in grandiose narcissism would be less affected by the negative feedback than participants lower in comparative optimism. Additionally, there was not an interaction between hypersensitive narcissism and feedback condition. This does not support my last hypothesis that participants higher in hypersensitive narcissism would be more affected by negative feedback than those lower in hypersensitive narcissism.

In summary, this analysis found that grandiose narcissism positively predicted comparative optimism while hypersensitive narcissism negatively predicted comparative optimism. The feedback condition did not influence participants' comparative optimism, nor did the influence of feedback depend on participants' level of grandiose or hypersensitive narcissism.

### **Exploratory Analyses**

Because grandiose narcissism was related to self-esteem and hypersensitive narcissism was related to both self-esteem and gender, I ran a similar analysis to the one I used to test my hypotheses, only this time grand mean-centered self-esteem and gender were entered into the analysis as control variables. Additionally, the interactions of self-esteem X feedback condition and gender X feedback condition were included. Given the very small number of participants who indicated a gender other than man or woman, this analysis only included participants who identified as a man or woman. When adding gender and self-esteem in the model, grandiose narcissism remained a significant predictor of comparative optimism, but the relationship was much weaker than in the main analysis (see Table 3). Hypersensitive narcissism was no longer a significant predictor of comparative optimism.

**Table 3**

*Regression Analysis Predicting Comparative Optimism from Grandiose Narcissism, Hypersensitive Narcissism, and Feedback Condition while Controlling for Self-Esteem and Gender*

|  | <i>B</i>              | <i>SE B</i> | $\beta$              | <i>t</i>    | <i>p</i>         |
|--|-----------------------|-------------|----------------------|-------------|------------------|
| <b>Grandiose Narcissism</b>                    | <b>.53</b>            | <b>.27</b>  | <b>.19</b>           | <b>2.02</b> | <b>.045</b>      |
| Hypersensitive Narcissism                      | -.14                  | .08         | -.16                 | -1.77       | .078             |
| Feedback Condition                             | .07                   | .24         | .15                  | .29         | .771             |
| <b>Self-Esteem</b>                             | <b>.24</b>            | <b>.07</b>  | <b>.35</b>           | <b>3.55</b> | <b>&lt; .001</b> |
| Gender   | -.08                  | .10         | -.07                 | -.85        | .394             |
| Grandiose Narcissism * Feedback Condition      | -.55                  | .37         | -.19                 | -1.48       | .140             |
| Hypersensitive Narcissism * Feedback Condition | .21                   | .12         | .24                  | 1.81        | .072             |
| Self-Esteem * Feedback Condition               | .11                   | .09         | .17                  | 1.20        | .230             |
| Gender * Feedback Condition                    | .00                   | .13         | .00                  | .00         | 1.00             |
|  | <i>R</i> <sup>2</sup> |             | <i>F(df)</i>         |             | <i>p</i>         |
| <b>Model Summary</b>                           | <b>.28</b>            |             | <b>8.96 (9, 206)</b> |             | <b>&lt; .001</b> |

Notably, these differences were largely accounted for by adding self-esteem in the model, rather than gender. There were no significant interactions between feedback condition and any of the other predictors added into the analysis.

### *Narcissism, Threat, and Negative Affect*

To study the relationship between the main predictors and negative affect, an additional regression analysis was conducted. The grand mean-centered variables of grandiose narcissism, hypersensitive narcissism, and feedback condition were used as the predictors with negative affect being the criterion. As before, the interactions of grandiose narcissism X feedback condition and hypersensitive narcissism X feedback condition were entered into the model. Grandiose narcissism did not significantly predict negative affect, but hypersensitive narcissism did predict lower negative affect (see Table 4). Neither of the interactions were significant. All of these relationships remained the same when conducting a



**Table 4**

*Regression Analysis Predicting Negative Affect from Grandiose Narcissism, Hypersensitive Narcissism, and Feedback Condition*

|  | <i>B</i>              | <i>SE B</i> | $\beta$              | <i>t</i>    | <i>p</i>         |
|--|-----------------------|-------------|----------------------|-------------|------------------|
| Grandiose Narcissism                           | -.36                  | .48         | -.07                 | -.75        | .455             |
| <b>Hypersensitive Narcissism</b>               | <b>.66</b>            | <b>.15</b>  | <b>.40</b>           | <b>4.51</b> | <b>&lt; .001</b> |
| Feedback Condition                             | .10                   | .11         | .12                  | .94         | .350             |
| Grandiose Narcissism * Feedback Condition      | -1.06                 | .68         | -.20                 | -1.56       | .120             |
| Hypersensitive Narcissism * Feedback Condition | .02                   | .21         | .01                  | .10         | .919             |
|  | <i>R</i> <sup>2</sup> |             | <i>F(df)</i>         |             | <i>p</i>         |
| <b>Model Summary</b>                           | <b>.18</b>            |             | <b>9.41 (5, 210)</b> |             | <b>&lt; .001</b> |

similar analysis with self-esteem and gender added in as control variables (as well as their interactions with feedback condition).

### *Follow-Up Questions*

I conducted independent samples t-tests to check for differences between the neutral and negative feedback conditions on the follow up questions asking about participants' perceptions of the problem-solving test and feedback they received (see Appendix I).

Participants in the neutral feedback condition rated themselves as being better at solving problems as compared to those in the negative feedback condition ( $p = .028$ ,  $d = .30$ ). This suggests that the feedback

manipulation might have been successful in influencing participants' perceptions of their problem-solving abilities. Participants in the negative feedback condition considered their feedback to be less reflective of their abilities ( $p < .001$ ,  $d = .76$ ) and the task to be a less accurate measure of their problem-solving ability than those in the neutral feedback condition ( $p < .001$ ,  $d = .57$ ). Furthermore, those in the negative feedback condition were less likely to think that problem-solving related to their future career, relationship, and health success ( $p =$

.006,  $d = -.37$ ). Overall, people in the negative feedback condition were less likely to believe the feedback they received ( $p < .001$ ,  $d = .56$ ).

**Follow-Up Questions and Narcissism.** I conducted a series of regressions with the two types of narcissism and feedback condition entered in as predictors, and each of the follow-up questions serving as the outcome variables. The grandiose narcissism X feedback interaction and hypersensitive narcissism X feedback interaction were also used as predictors. I will only discuss the significant findings here. Participants higher in grandiose narcissism were more likely to think that they would have rated their problem-solving as above average before this study ( $p = .015$ ). Higher grandiose narcissism was associated with thinking the feedback received was less reflective of their problem-solving abilities ( $p < .001$ ). Grandiose narcissism was also related to rating the task as a less accurate measure of problem-solving ability, although this relationship was close to being nonsignificant ( $p = .048$ ). Lastly, grandiose narcissism predicted less belief in the feedback received ( $p = .007$ ).

### Discussion

The current study investigated how grandiose and hypersensitive narcissism relate to comparative optimism when the self-concept is threatened. As hypothesized, grandiose narcissism related to more comparative optimism about experiencing future events, whereas hypersensitive narcissism was associated with being more pessimistic about experiencing future events. Contrary to what I predicted, participants in the negative and neutral feedback conditions were similarly optimistic. There were also no interactions between either type of narcissism and feedback condition.

### **Narcissism and Optimism for Desirable and Undesirable Events**

Overall, participants higher in grandiose narcissism were more optimistic about their likelihood of experiencing future events. Particularly, they thought desirable events were more likely to happen to them than their peers. This finding supports those of Tamborski et al. (2012), who also found that grandiose narcissism predicted more comparative optimism for desirable events. In their study and the current study, grandiose narcissism was not associated with comparative optimism for undesirable events. This may be because people higher in grandiose narcissism tend to actively think more about future success, like when they engage in fantasies of grandeur (e.g., Dinić et al., 2021). Conversely, they may not actively think about bad events not happening to them, and therefore may not self-enhance as much in that regard.

Unlike those higher in grandiose narcissism, participants higher in hypersensitive narcissism tended to be more pessimistic about their likelihood of experiencing future events in comparison to their peers. This finding fills a gap in the literature on how hypersensitive narcissism relates to comparative optimism. The previous research on hypersensitive narcissism and optimism looked at general optimism for the future, which involves making absolute judgments about general future events rather than judgments about the likelihood of experiencing specific future events as compared to one's peers (Kealy et al., 2017). An advantage of studying comparative optimism is that it gives insight to the type of events that people think they are more or less likely to experience compared to others. Whether someone thinks certain events will or will not happen to them can also have implications for how people prepare for those events. For example, if a tennis player is overly optimistic about winning their next match, they may not feel the need to practice as much for that game which

may result in poorer performance than usual and them potentially losing. Or, if that tennis player is overly pessimistic and thinks that they have no chance of winning their next match, that may also result in them having less motivation to practice and put their best effort in the game, thus confirming their expectations.

The relationship between hypersensitive narcissism and comparative pessimism was mainly driven by participants' pessimism for undesirable events, or thinking that undesirable events are more likely to happen to them than their peers. This finding is consistent with other research studying the relationship between hypersensitive narcissism and greater negativity bias. For example, people higher in hypersensitive narcissism tend to have a better memory for negative words rather than positive words (Krusemark et al., 2015).

Hypersensitive narcissism is also related to more depression and anxiety (e.g., Erkoreka & Navarro, 2017; Huprich et al., 2012; Miller et al., 2011). Given that pessimism is related to poorer well-being (Dufner et al., 2019; Taylor & Brown; 1988), it makes sense that people higher in hypersensitive narcissism expect more undesirable events to occur to them compared to other people.

### **Feedback Manipulation**

The feedback manipulation in the current study did not affect people's optimism for the future. Additionally, the influence of receiving neutral or negative feedback did not depend on participants' level of grandiose or hypersensitive narcissism. In other words, regardless of how narcissistic someone was, participants in both feedback conditions responded similarly on the comparative optimism measure. Although not of primary interest to the current study, I did investigate the relationship between type of narcissism, feedback condition, and negative affect. Hypersensitive narcissism was associated with higher negative

affect, whereas grandiose narcissism was not associated with negative affect. Negative affect did not change based on feedback received, nor did this relationship depend on type of narcissism.

The current study was the first to look at both types of narcissism while measuring comparative optimism after a threat to the self-concept. Despite having a novel study design, the results I found contradict the theoretical research suggesting that people higher in grandiose narcissism are more resilient to negative feedback (Campbell et al., 2000; Kernis & Sun, 1994) and people higher in hypersensitive narcissism are more sensitive to negative feedback (Atlas & Them, 2008; Hendin & Cheek, 1997; Wink, 1991). Additionally, not finding an interaction between grandiose narcissism and feedback condition on internalizing factors is inconsistent with previous research which found that grandiose narcissism was associated with being either less affected by the threat (Atlas & Them, 2008; Hart et al., 2017; Rhodewalt & Morf, 1998) or more affected by the threat (Besser & Priel, 2010). The lack of an interaction between hypersensitive narcissism and threat to the self-concept is in line with previous empirical research (Atlas & Them, 2008; Besser & Priel, 2010; Hart et al., 2017). There are at least two reasons as to why there were not any interactions between narcissism and feedback in the current study. First, it is possible that the participants did not believe the feedback. Second, it is possible the participants believed the feedback, but negative feedback does not influence comparative optimism.

### ***Results Explained if Participants Did Not Believe the Feedback Manipulation***

The feedback manipulation may not have affected participants' comparative optimism (or negative affect) for several reasons. Some of those reasons can be explained by participants not believing some part of the feedback manipulation, whether it be the feedback

itself, that the problem-solving test was actually measuring their problem-solving ability, and/or that their scores on the test relate to their future career, relationship, and health success. With the feedback itself, participants in the negative feedback condition did rate the feedback to be less believable than those in the neutral feedback condition. One potential reason participants in the negative feedback condition were less likely to believe the feedback they received could be that they were generally able to feel confident in how well they performed on the test. If the problem-solving test was too easy, or participants were overly confident in their answers, this could have led them to not believe the feedback telling them that they scored much worse than the average Appalachian State student.

Participants also may not have thought the relationship between problem-solving ability and future events was important. Although all participants read a prompt about problem-solving ability and how it is predictive of future success, the connection between the two is not as direct as other feedback manipulations used in the literature. For example, previous studies investigating the relationship between narcissism and threat have used emotions like anger or depressed mood as the main dependent variable (e.g., Atlas & Them; Bushman & Baumeister, 1998; Bushman et al., 2009; Hart et al., 2017; Rhodewalt & Morf, 1998). For the manipulation to work in those studies, people just needed to believe the feedback and care about it, but for my manipulation to work, people must believe the feedback, care about it, *and* believe that their scores on the test relate to their future success in careers, relationships, and health. That said, feedback condition also did not influence negative affect in the current study. However, this may be because not all of the factors measured in the negative affect scale would likely be affected by the negative feedback (e.g., afraid, jittery).

It is also possible that the feedback manipulation may have been ineffective due to some limitations of the study. The study was conducted entirely online, which may have affected how much effort people put into the problem-solving test. In a laboratory setting, participants may have been more motivated to try hard on the problem-solving test because all the materials to work on it would be supplied for them (i.e., paper and pencil), and there would be a research assistant supervising them while they complete the study. The more effort people put into the test, the more likely they would be to believe that the feedback they received is reflective of their problem-solving ability. If they do not put in much effort, then the negative feedback they received could be explained by their lack of effort, not lack of ability. Thus, their self-concept would not be threatened.

There would also be fewer potential distractions in a laboratory study as compared to an online study. If participants were distracted while completing the current study, they may have justified not doing well on the problem-solving test as a result of being distracted. This could cause them to not internalize the negative feedback as an accurate representation of their problem-solving ability. Additionally, in a laboratory setting, a research assistant could have recorded participants' scores on the test, possibly making the participants care more about the feedback they received. To better understand the relationship between narcissism, negative feedback, and comparative optimism, future studies should be conducted in person to make the feedback manipulation more successful.

Another limitation of the study has to do with the questions used in the problem-solving measure. Due to the survey time restrictions, there were only five problem-solving questions in the test. For the average person to adequately answer all five of the analytical reasoning questions, they would likely have to spend a few minutes on each question. This

may have affected the face validity of the problem-solving test, with participants potentially thinking that their answers on five questions could not have any meaningful relationship with their future success. Additionally, having a wider variety of problem-solving questions, such as verbal reasoning questions and questions relating to real-world situations, may have helped participants generalize problem-solving ability measured in the test to be representative of their problem-solving ability as a whole. Overall, future research can address these issues by adopting or developing a longer, more general measure of problem-solving to help participants believe the feedback and how it relates to their future success.

### ***Results Explained if Participants Did Believe the Feedback Manipulation***

Although it is possible that the participants did not believe the negative feedback they received, it is also possible the feedback was believed. Participants in the negative feedback condition rated their problem-solving ability lower than those in the neutral feedback condition. It is possible that participants did believe the feedback, but those in the negative feedback condition engaged in self-protective strategies more than participants in the neutral feedback condition. This could potentially explain why participants' optimism and negative affect were not affected by the feedback they received. This is supported by people in the negative feedback condition thinking the task was not as accurate a measure of their problem-solving ability, the feedback was not as reflective of their abilities, and thinking that problem-solving was less likely to relate to their future success. Invalidating the test itself, thinking the feedback was inaccurate, and minimizing the importance of problem-solving are all forms of protecting oneself from negative feedback (Campbell et al., 2000; Grijalva & Zhang, 2016; Kernis & Sun, 1994; also see Alicke & Sedikides, 2011 for review). If this was the case, it may explain why there were no differences in optimism and negative affect



depending on feedback condition. This would be especially true if the threat manipulation was weak, making it more likely that anyone could engage in these strategies enough to where they would not internalize the negative feedback.

It is important to note that the negative feedback condition did have more information available to make judgments about the problem-solving task than the neutral feedback condition. Because those in the neutral feedback condition were never given context for how they scored, they may not have had sufficient information to judge how accurately the task measured their problem-solving and how reflective the feedback is of their problem-solving ability. Additionally, they may not have had much of a reason to not believe their feedback score since it was just an ambiguous number. However, the participants in both conditions did read the same information about problem-solving relating to future success in careers, relationships, and health, yet those in the negative feedback condition rated problem-solving as less important for future success. This garners more evidence to support the idea that people in the negative feedback condition were likely engaging in self-protection to some extent.

As mentioned, grandiose narcissism has been associated with a greater tendency to engage in self-enhancement and self-protection strategies (e.g., Back et al., 2013; Grijalva & Zhang, 2016; Morf et al., 2011). In the current study, participants higher in grandiose narcissism indicated that they would have rated their problem-solving ability more highly than those lower in grandiose narcissism before taking the study. Additionally, those higher in grandiose narcissism rated the task to be a less accurate measure of problem-solving, their feedback to be less reflective of their abilities, and their feedback to be less believable. Notably, this tendency did not depend on whether they received neutral or negative feedback.

Given the importance of problem-solving and the difficulty of the problem-solving test, the test may have been threatening enough on its own to make people higher in grandiose narcissism engage in self-protective behaviors regardless of the feedback they received. It is especially likely that the self-protective strategies of people higher in grandiose narcissism kicked in because the neutral feedback was ambiguous rather than positive like many studies investigating threat and narcissism, so participants were just relying on how they thought they did on the test in the neutral feedback condition.

The difficulty of the test alone may have been enough to threaten participants' self-concept, thus eliminating any additional effects of receiving neutral or negative feedback. The questions used were pulled from a practice LSAT exam, and were intentionally chosen so that participants would not be confident in how many they got correct. However, if it was too difficult then people receiving neutral feedback may have assumed they did poorly on the test if they struggled a lot with the answers. As mentioned, future research should develop a longer and more general measure of problem-solving, which would also address this issue. Additional questions should vary more in difficulty, so participants cannot assume how well they did from the test alone.

Regardless of how difficult participants found the test, it is possible that problem-solving ability was not important to participants' self-concepts. Problem-solving ability was chosen because the study used college students as its participants. It was presumed that college students would value how well they scored on problem-solving since they likely use it in their classes and would probably utilize problem-solving in their future careers. In the study, participants were also told that problem-solving ability related to people's future success in their careers, relationships, and health. However, the current study did not assess

how much participants valued problem-solving ability or their future career, relationships, and health. If participants did not think problem-solving ability or their future success in those aspects was important to their self-concept, then scoring low on problem-solving ability would not threaten their self-concept. This could explain why there was no relationship between the feedback participants received on the test and their optimism for future events. Future studies should investigate what types of feedback manipulations are important to people's self-concepts, especially those higher in grandiose and hypersensitive narcissism.

Another possible reason the feedback manipulation did not influence participants' comparative optimism scores or negative affect is because the current study compared neutral and negative feedback instead of positive and negative feedback. Comparing responses to positive and negative feedback is likely to yield a larger effect that is easier to detect because the two types of feedback are opposite of one another. Given that the current study was interested in the influence of negative feedback specifically, I compared participants' optimism and negative affect after receiving either neutral feedback or negative feedback. It is possible that seeing no difference in optimism or negative affect was a result of the feedback manipulation being ineffective, or it is possible that the differences in outcome variables in previous studies are largely driven by receiving positive feedback rather than negative feedback. Because studying comparative optimism as an outcome measure was novel to the current study, it is also plausible that there is no relationship to be found between negative feedback and optimism, even if all the problems mentioned above were fixed. Future research should investigate the effects of positive, neutral, and negative feedback to help clarify the effects that each type of feedback has on subsequent outcome measures.

## Conclusion

Overall, my study built upon the current understanding of narcissism and optimism for future events. Participants higher in grandiose narcissism tended to think that desirable events were more likely to happen to them than their peers. Given that the self-enhancement of people higher in grandiose narcissism is typically not corroborated by reality (e.g., Bleske-Rechek et al., 2008; Campbell et al., 2004; Farwell & Wohlwend-Lloyd, 1998; Gabriel et al., 1994; John & Robins, 1994; Paulhus, 1998), it is likely that people higher in grandiose narcissism were being *overly* optimistic in their perceptions of their future. While there are some benefits to over optimism, such as having greater well-being and more motivation to achieve their goals (Dufner et al., 2019; Taylor & Brown, 1988), being too optimistic can also leave someone unprepared and more disappointed in the case that a desirable event they were expecting does not happen (Shepperd & McNulty, 2002).

Unlike their grandiose counterparts, people higher in hypersensitive narcissism tended to be more pessimistic about experiencing undesirable future events. Being overly pessimistic is associated with detriments like poorer well-being (Dufner et al., 2019; Taylor & Brown, 1988). For example, if someone consistently expects bad things to happen to them, then this could potentially lead to more depressed mood and anxiety. For both types of narcissism, a more realistic outlook on the future may help with their well-being as well as being prepared for both desirable and undesirable events which may occur.

Despite the feedback manipulation not affecting comparative optimism, this study does provide insight into what types of feedback are effective (or rather, not effective). Given the main dependent variable not being directly related to problem-solving ability, people in the negative feedback condition may have been easily able to engage in self-protective

strategies in order for the feedback to not threaten their self-concept. Ignoring relevant criticisms may be maladaptive by hindering people's growth, and being more optimistic than warranted could lead people to not take the proper steps to achieve desirable events or proper precautions to avoid or deal with undesirable events. However, the finding in the current study suggests that people were resilient to a weaker, less relevant form of negative feedback, which is likely to be adaptive by promoting greater well-being. Overall, this study highlights the need for more research investigating which types of feedback are effective in threatening a person's self-concept.

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**Appendix A****Narcissistic Personality Inventory (NPI)**

Read each pair of statements and choose the one that is closer to your own feelings about yourself.

1.     A. I have a natural talent for influencing people.  
       B. I am not good at influencing people.
2.     A. Modesty doesn't become me.  
       B. I am essentially a modest person.
3.     A. I would do almost anything on a dare.  
       B. I tend to be a fairly cautious person.
4.     A. When people compliment me I sometimes get embarrassed.  
       B. I know that I am good because everybody keeps telling me so.
5.     A. The thought of ruling the world frightens the hell out of me.  
       B. If I ruled the world it would be a better place.
6.     A. I can usually talk my way out of anything.  
       B. I try to accept the consequences of my behavior.
7.     A. I prefer to blend in with the crowd.  
       B. I like to be the center of attention.
8.     A. I will be a success.  
       B. I am not too concerned about success.
9.     A. I am no better or worse than most people.  
       B. I think I am a special person.
10.    A. I am not sure if I would make a good leader.  
       B. I see myself as a good leader.



11. A. I am assertive.  
B. I wish I were more assertive.
12. A. I like to have authority over other people.  
B. I don't mind following orders.
13. A. I find it easy to manipulate people.  
B. I don't like it when I find myself manipulating people.
14. A. I insist upon getting the respect that is due me.  
B. I usually get the respect that I deserve.
15. A. I don't particularly like to show off my body.  
B. I like to show off my body.
16. A. I can read people like a book.  
B. People are sometimes hard to understand.
17. A. If I feel competent I am willing to take responsibility for making decisions.  
B. I like to take responsibility for making decisions.
18. A. I just want to be reasonably happy.  
B. I want to amount to something in the eyes of the world.
19. A. My body is nothing special.  
B. I like to look at my body.
20. A. I try not to be a show off.  
B. I will usually show off if I get the chance.
21. A. I always know what I am doing.  
B. Sometimes I am not sure of what I am doing.
22. A. I sometimes depend on people to get things done.

- B. I rarely depend on anyone else to get things done.
23. A. Sometimes I tell good stories.  
B. Everybody likes to hear my stories.
24. A. I expect a great deal from other people.  
B. I like to do things for other people.
25. A. I will never be satisfied until I get all that I deserve.  
B. I take my satisfactions as they come.
26. A. Compliments embarrass me.  
B. I like to be complimented.
27. A. I have a strong will to power.  
B. Power for its own sake doesn't interest me.
28. A. I don't care about new fads and fashions.  
B. I like to start new fads and fashions.
29. A. I like to look at myself in the mirror.  
B. I am not particularly interested in looking at myself in the mirror.
30. A. I really like to be the center of attention.  
B. It makes me uncomfortable to be the center of attention.
31. A. I can live my life in any way I want to.  
B. People can't always live their lives in terms of what they want.
32. A. Being an authority doesn't mean that much to me.  
B. People always seem to recognize my authority.
33. A. I would prefer to be a leader.  
B. It makes little difference to me whether I am a leader or not.

34. A. I am going to be a great person.  
B. I hope I am going to be successful.
35. A. People sometimes believe what I tell them.  
B. I can make anybody believe anything I want them to.
36. A. I am a born leader.  
B. Leadership is a quality that takes a long time to develop.
37. A. I wish somebody would someday write my biography.  
B. I don't like people to pry into my life for any reason.
38. A. I get upset when people don't notice how I look when I go out in public.  
B. I don't mind blending into the crowd when I go out in public.
39. A. I am more capable than other people.  
B. There is a lot that I can learn from other people.
40. A. I am much like everybody else.  
B. I am an extraordinary person.

Scoring: Items A will be assigned a value of 0 and items B will be assigned a value of 1. The following items will be reverse-scored: 1, 2, 3, 6, 8, 11, 12, 13, 14, 16, 21, 24, 25, 27, 29, 30, 31, 33, 34, 36, 37, 38, and 39. The average of all the ratings was taken, with higher scores indicating higher grandiose narcissism.

## Appendix B

### Hypersensitive Narcissism Scale (HSNS)

Please answer the following questions by deciding to what extent each item is characteristic of your feelings and behavior.

| Very<br>Uncharacteristic | Uncharacteristic | Neutral | Characteristic | Very<br>Characteristic |
|--------------------------|------------------|---------|----------------|------------------------|
| 1                        | 2                | 3       | 4              | 5                      |

1. I can become entirely absorbed in thinking about my personal affairs, my health, my cares or my relations to others.
2. My feelings are easily hurt by ridicule or the slighting remarks of others.
3. When I enter a room I often become self-conscious and feel that the eyes of others are upon me.
4. I dislike sharing the credit of an achievement with others.
5. I feel that I have enough on my hands without worrying about other people's troubles.
6. I feel that I am temperamentally different from most people.
7. I often interpret the remarks of others in a personal way.
8. I easily become wrapped up in my own interests and forget the existence of others.
9. I dislike being with a group unless I know that I am appreciated by at least one of those present.
10. I am secretly "put out" or annoyed when other people come to me with their troubles, asking me for my time and sympathy.

Scoring: The average of all 10 items was used to measure hypersensitive narcissism. Higher scores indicated higher hypersensitive narcissism.

**Appendix C****Example LSAT Problem-Solving Question**

Each set of questions in this section is based on a scenario with a set of conditions. The questions are to be answered on the basis of what can be logically inferred from the scenario and conditions. For each question, choose the response that most accurately and completely answers the question.

Seven piano students—T, U, V, W, X, Y, and Z—are to give a recital, and their instructor is deciding the order in which they will perform. Each student will play exactly one piece, a piano solo. In deciding the order of performance, the instructor must observe the following restrictions:

X cannot play first or second.

W cannot play until X has played.

Neither T nor Y can play seventh.

Either Y or Z must play immediately after W plays.

V must play either immediately after or immediately before U plays.

If V plays first, which one of the following must be true?

T plays sixth.

X plays third.

Z plays seventh.

T plays immediately after Y.

W plays immediately after X.

## Appendix D

### Comparative Optimism Events

Please indicate the likelihood that each of the following events will happen to you *compared to other Appalachian State students of the same age and gender*.

| Much Less<br>Likely to<br>Happen to<br>Me  | 2 | 3 | About as<br>Likely to<br>Happen to<br>Me | 5  | 6 | Much<br>More<br>Likely to<br>Happen to<br>Me | 7 |
|--|---|---|--|--|---|--|---|
| 1  | 2 | 3 | 4  | 5  | 6 | 7  | 7 |
| Desirable Events   |   |   |  | Undesirable Events   |   |  |   |
| 1. Feel your life is “going in the right direction.”<br>2. Hear that your favorite musical group will release a new album next month.<br>5. Win a sweepstakes.<br>7. Have an out-of-town friend visit you.<br>11. Purchase your dream home.<br>12. Exercise at least twice a week.<br>13. Visit a friend more than 1,000 miles away.<br>15. Take a 6-day (or longer) vacation.<br>18. Make a salary of more than \$1 million per year.<br>19. Take a vacation out of the country.<br>20. Live past 80.<br>22. Spend Thanksgiving with loved ones.<br>25. Be treated to an elegant dinner by a friend.<br>27. Meet a person who becomes a good friend.<br>28. Have a person at the grocery store decide to pay for your groceries.<br>30. Receive an unexpected and substantially large tax refund.<br>33. Have your work recognized with an award.<br>36. See an old friend on the street. |   |   |  | 3. A neighbor plays their music too loud.<br>4. Be mistaken for another person.<br>6. Be injured in an auto accident.<br>8. Gain 80 pounds.<br>9. Get cancer.<br>10. Get a paper cut.<br>14. Argue with a store manager over a transaction.<br>16. Die before 65 years of age.<br>17. Tear a hole in your clothes.<br>20. Go blind.<br>23. Have your marriage end in a bitter divorce.<br>24. Be fired from a job.<br>26. Get a parking or speeding ticket.<br>29. Find rotten food in the refrigerator.<br>31. Have a heart attack.<br>32. Witness the robbery of a convenience store.<br>34. Get sick from drinking too much alcohol.<br>35. Have your credit card declined at a store |   |  |   |

Scoring: The average of the 18 desirable events and the reverse-score of the 18 undesirable events measured comparative optimism. Higher scores indicated higher comparative optimism.

**Appendix E****Negative Items from the Positive and Negative Affect Scale (PANAS)**

Please indicate to what extent you are feeling the following emotions.

| Very Slightly or<br>Not at All | A Little | Moderately | Quite a Bit | Extremely |
|--------------------------------|----------|------------|-------------|-----------|
| 1                              | 2        | 3          | 4           | 5         |
| 1. Distressed                  |          |            |             |           |
| 2. Upset                       |          |            |             |           |
| 3. Guilty                      |          |            |             |           |
| 4. Scared                      |          |            |             |           |
| 5. Hostile                     |          |            |             |           |
| 6. Irritable                   |          |            |             |           |
| 7. Ashamed                     |          |            |             |           |
| 8. Nervous                     |          |            |             |           |
| 9. Jittery                     |          |            |             |           |
| 10. Afraid                     |          |            |             |           |

Scoring: The average score for the 10 items was calculated as the measurement of negative affect. Higher scores indicated higher negative affect.



**Appendix F****Rosenberg Self-Esteem Scale (RSES)**

Below is a list of statements dealing with general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

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

Scoring: The average scores of items 1, 3, 4, 7, and 10 and the reverse-scores of items 2, 5, 6, 8, and 9 were used as the measure for self-esteem. Higher scores indicated higher self-esteem.

## Appendix G

### Informed Consent

#### Consent to Participate in Research

##### *Information to Consider About this Research*

#### Personality and Problem Solving

Principal Investigator: Jade Schilling - [schillingje@appstate.edu](mailto:schillingje@appstate.edu)

Faculty Advisor: Dr. Andrew Smith - [smithar3@appstate.edu](mailto:smithar3@appstate.edu); 828-262-2272

Department: Psychology

This study is looking at how personality might be related to problem solving ability. In this study, you will be asked questions about your personality, age, and gender. You will also complete a problem-solving task. There will be around 600 people who complete this study. Participation will take less than 60 minutes.

You cannot volunteer for this study if you are under 18 years old.

This study is confidential. Your name will not be connected to your responses. The confidential data from this study may be shared with other research or used in future research.

There may be no personal benefit from your participation. The information gained from this research will help us learn how personality relates to problem-solving. The risks for participating in this study are no more than you would experience in everyday life. It is possible that you could experience some psychological distress from the feedback about your problem-solving ability. If you experience distress, please contact the campus Counseling Center at 828-262-3180 on the first floor of the Miles Annas Student Support building (<https://counseling.appstate.edu/>).

You will not be paid for your time. Completing this survey will earn you 2 ELCs. There are other options to earn ELCs. One option is to read an article and write a 1–2 page paper summarizing the article and your reaction to it. More information can be found at: <https://psych.appstate.edu/research-labs>. Please talk to your professor to see if other options are available.

You are not required to participate in this study. If you do not volunteer, there will be no penalty. If you take part in the study, you can stop at any time. You may also skip any question you do not want to answer. There will be no penalty if you stop participating in the study.

The people conducting this study can answer questions about this research. You may contact the Principal Investigator at [schillingje@appstate.edu](mailto:schillingje@appstate.edu). If you have questions about your rights as someone taking part in research, contact the Appalachian Institutional Review Board Administrator at 828-262-2692, through email at [irb@appstate.edu](mailto:irb@appstate.edu), or at Appalachian

State University, Office of Research and Sponsored Programs, IRB Administrator, Boone, NC 28608.

This research has been approved on March 31<sup>st</sup>, 2021 by the Institutional Review Board (IRB) at Appalachian State University.

**By continuing to the survey, I acknowledge that I am at least 18 years old, have read the above information, and provide my consent to participate under the terms above.**

## **Appendix H**

### **Prompt for Problem-Solving Ability Test**

In the next portion of this survey you will complete a test measuring your problem-solving ability.

As you likely know, problem-solving ability is an important skill in everyday life. People who are better at solving problems typically have better outcomes with regard to their career, relationships, and health.

In fact, a study conducted at App State in 2016 found that students who scored highly on this test were more likely to receive a job offer in their desired field within 6 months of graduating. Students who scored poorly on this test were less likely to receive a job offer in their desired field and many did not have any job 6 months after graduating.

After you complete the problem-solving test, you will get feedback on your score. Therefore, it is important that you try hard to correctly answer all of the questions.

### Appendix I

#### Follow-Up Questions Regarding Problem-Solving Ability Test

1. Overall, how good do you think you are at solving problems?

Below Average    1    2    3    4    5    Above Average

2. Do you think people's problem-solving ability is related to their future success in their career, relationships, and health?

Yes                      No

3. Do you think your score on the problem-solving task accurately reflects your problem-solving ability?

Not At All Reflective    1    2    3    4    5    Completely Reflective

4. Do you think the problem-solving task is an accurate measure of your overall problem-solving ability?

Not At All Accurate    1    2    3    4    5    Completely Accurate

5. Before this study, how would you have rated your problem-solving ability?

Below Average    1    2    3    4    5    Above Average

6. How important is problem-solving ability in everyday life?

Not At All Important    1    2    3    4    5    Extremely Important

7. Did you believe the feedback you received?

Not At All    1    2    3    4    5    Absolutely

## Appendix J

### Debriefing Prompt

In this study, you completed measures of your personality and completed a problem-solving test.

**IMPORTANT:** The feedback you received about the problem-solving test was NOT accurate. In fact, the test did not score your performance on problem-solving ability. The questions were designed to be very challenging, so most people wouldn't know the answers.

Everyone in this study received random feedback that was generated by the survey. This was done to examine how people respond to feedback, regardless of their performance. Please disregard the feedback you received and know that it was not an accurate assessment of your problem-solving ability.

Additionally, the study you read that was conducted at App State in 2016 using this problem-solving test was never actually conducted. So, not only was the feedback false, but the study and its implications for people's future success was made up.

Your participation in this study is important and will help us understand how personality characteristics relate to how people react to feedback. Whether people reject or internalize the feedback can affect their expectations for the future and have implications for how they prepare for positive and negative life events.

If you are experiencing any distress by participating in this study, please contact the campus Counseling Center at 828-262-3180 on the first floor of the Miles Annas Student Support building (<https://counseling.appstate.edu/>).

### Vita

Jade Ellis Schilling was born in Atlanta, GA to John and Jeanean Schilling. She lived in Charlotte, NC for most of her life until moving to Boone, NC in August of 2015 to attend college at Appalachian State University. In December of 2018, Jade graduated *magna cum laude* with a Bachelor of Arts in Psychology and minors in Spanish and Studio Art. After graduating, Jade continued to work as a research assistant with Dr. Lisa Curtin in the Rural Evidence-based Addictions & Community Treatment (REACT) Lab, and she began working as a research assistant with Dr. Andrew R. Smith in the Social Cognition and Motivated Reasoning (SCAMR) Lab.

In August of 2019, Jade began her graduate education through the Experimental Psychology Master of Arts program at Appalachian State University. In the program, she researched positive thinking and emotions while working under the mentorship of Dr. Smith. After graduating, Jade plans to develop her research skills further before pursuing a doctoral degree in clinical psychology. Ultimately, Jade aspires to be a clinical researcher and therapist.