

AUTONOMIC RESPONSES TO NEGATIVE PERSONAL FEEDBACK IN
NARCISSISTIC INDIVIDUALS

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ABSTRACT

AUTONOMIC RESONSES IN NARCISSISTIC INDIVIDUALS

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While narcissistic traits have a long, observable history, little is known about the possible biological underpinnings that may be fueling these behaviors. The link between narcissism and aggression is clear; with hostility and antagonism often being the response in narcissistic persons when they suffer ego threat. However, the question remains whether these outward behaviors are the result of physiological reactions or just that of choice. In an attempt to address this question, several theories about the driving force behind narcissism have been proposed. These include the idea that individuals high in narcissism are aggressive in an attempt to disguise low or unstable self-esteem; narcissism is “automatic” instead of a conscious decision about how to behave; as well as the idea that narcissism is simply the result of an inability to inhibit oneself.

The purpose of this study is to explore the relationship between narcissistic traits and autonomic responses to personal feedback. This information could aid in determining whether narcissistic individuals are unable to control their impulses at a biological level. If so, this would indicate that these individuals' behaviors would be motivated in a way similar to behavioral patterns seen with addiction.

CHAPTER ONE: INTRODUCTION

Humans have an innate desire to fit in, to be accepted, and be involved in close, lasting relationships with others. Rejection by peers is the driving force behind many apprehensions. Fear of being rejected underlies concepts such as ‘stage fright’, performance anxiety, and even psychological disorders like social phobia and avoidant personality disorder (4th ed., text rev; DSM-IV-TR; American Psychiatric Association, 2000). Indeed, social rejection appears to have the same or similar neurological underpinnings as physical pain (Eisenberger, Lieberman, & Williams, 2003; MacDonald & Leary, 2005), and has been called a threat to survival due to its impact on individuals’ social motivations and sensitivity to social cues (e.g., Baumeister & Leary, 1995). Because of human’s innate desire to fit in, most people seek cues of approval from others, and adapt their behavior in order to become part of a group.

However, there are individuals for whom this need for acceptance is extreme and in some cases it becomes a pathological need for admiration. These individuals have an inflated- though unstable- sense of self-esteem, and thus constantly seek favorable interpersonal feedback. Moreover, these individuals become upset if the feedback they receive does not conform to their entitled and grandiose cognitions. The aforementioned

interpersonal pattern is captured by the construct of narcissism. In the clinical and social psychology literature, individuals with narcissistic personality disorder (NPD) and narcissistic traits are described as demonstrating a persistent pattern of grandiose sense of self-importance, entitlement, need for admiration, and lack of empathy. They believe they are superior to others and that they should be recognized in this way (4th ed., text rev; DSM-IV-TR; American Psychiatric Association, 2000; Paulhus, Robins, Trzesniewski, & Tracy, 2004).

Historically, narcissistic traits have been a major interest in the area of personality research. The term *narcissism* comes from the ancient Greek myth of Narcissus, a handsome young man that fell in love with his own reflection in a pool of water (Keys, 2004). In 1898, British sexuality researcher, Henry Havelock Ellis, referenced the myth by identifying the “narcissus-like” behavior seen with excessive masturbation, autoeroticism, and the idea of that the individual becomes the object of his or her own sexual desires (Ellis, 1897-1928). Paul Näcke was the first to use the term “narcissism” in a clinical sense in an 1899 study of sexual perversions (Freud, 1914). In 1911, Otto Rank published the first psychoanalytic paper discussing narcissism and subsequently linking it to vanity and self-admiration (Millon, Grossman, Millon, Meagher & Ramnath, 2000). Then in 1914, Sigmund Freud published an essay exclusively on narcissism entitled “On

Narcissism: An introduction” in which he states it is typically a normal stage of development and extension of the libido (Freud, 1914). Almost a decade later, the article “I and Thou” written by Martin Buber pointed out how narcissism has a tendency to make an individual relate to others as objects instead of equals (Buber, 1923). In the 1970s Heinz Kohut proposed that narcissistic attitudes including aggressive reactions were a cover for poor self-esteem (Kohut, 1972).

During the latter half of the 1970’s, research began shifting the focus from the behavioral reactions and tendencies of these individuals to the development of instruments that would measure an individual’s levels of narcissistic traits (Raskin & Hall 1979). In 1979, Raskin and Hall developed the Narcissistic Personality Inventory (NPI), which was designed to evaluate individual differences in the levels of narcissism in non-clinical populations. The NPI consists of 40 true-false statements, which reflect both narcissistic as well as non-narcissistic sentiments (e.g. “I find it easy to manipulate people” or “I don’t like when I find myself manipulating people”). The NPI has been consistently validated and shown to correlate highly with the narcissism scales on the Millon Clinical Multiaxial Inventory (MCMI), an instrument used to assess narcissism levels in clinical populations (Auerbach, 1984; Millon, 1982). Since its development, the NPI has contributed greatly to the study of narcissism. Able to accurately quantify the

outward, observable behaviors and internal beliefs of these individuals, it has become one of the most widely used measures to test narcissism levels in non-clinical populations.

Factor analyses of the NPI show that there are four main subfactors of narcissism: Exploitativeness/Entitlement, Leadership/Authority, Superiority/Arrogance, and Self-absorption/Self-admiration (Emmons, 1984, 1987). These factors compose its two subscales, the NPI- Adjustment and Maladjustment scales. The subfactors of Superiority/Arrogance, Leadership/Authority, and Self-absorption/Self-admiration comprise the NPI adjustment scale (NPI-Adj) (Dickinson and Pincus, 2003). These factors are all positively correlated with self-esteem, suggesting that individuals high in these narcissistic traits typically report higher self-esteem. The final subfactor, which comprises the NPI maladjustment scale (NPI-Mal) (Dickinson and Pincus, 2003), Exploitativeness/Entitlement (E/E) appears to be unrelated to self-esteem (Emmons, 1984; Watson & Biderman, 1993), yet is highly correlated with an individual's tendency to be manipulative, exploitive (Emmons, 1984, p. 292), suspicious, and neurotic (Emmons, 1984, p. 295). Other maladaptive characteristics associated with this factor include depression and anxiety (Watson & Biderman, 1993), hostility towards others (Ruiz, Smith, & Rhodewalt, 2001) as well as a lack of empathy, which reflects deficits in the ability to understand emotions of others as well as trouble understanding another

person's point of view (Emmons, 1984, 1987; Watson et al., 1984).

Exploitativeness/Entitlement is also correlated with interpersonal aggression and neuroticism (Ruiz et al., 2001), perhaps exacerbated by a tendency for individuals with high scores in this factor to interpret ambiguous social situations as directed toward them (McCullough, Emmons, Kilpatrick, & Money, 2003). Further, because narcissists continuously look to others for validation of their worth and uniqueness, they are exceedingly vulnerable and sensitive to criticism and defeat (DSM-IV-TR, 2000). Though this might not be shown outwardly, criticism may haunt these individuals and leave them feeling humiliated and empty (DSM-IV-TR, 2000).

Notably, many narcissists are able to mask their true feelings and make good first impressions. They are usually extroverted and find it easy to socialize and approach people (Back, Schmukle, & Egloff, 2010). Nevertheless, this initial amicability is short-lived. Due to their exploitiveness and egocentrism, it is highly difficult if not almost impossible for them to sustain a favorable social standing (Back et al., 2010; Campbell, Bush, Brunell & Shelton, 2005; Paulhus & John, 1998). One explanation for this inability to conceal or mask these negative traits is that the egotism displayed by narcissists may be *automatic*, rather than a conscious, meticulous or manipulative decision (Paulhus & Levitt, 1987).

The idea of automatic egotism is relatively novel. Previously, research examining narcissists' aggressive behavior in reaction to rejection has focused on what their *intentions* were or what they believed would be gained. As previously mentioned, classic conceptualizations suggested that narcissistic attitudes were a defensive reaction that attempted to disguise low self-esteem (Kohut, 1972). More recently, theoreticians such as Baumeister, Bushman, and Campbell (2000) have questioned "what exactly narcissistic people hope to accomplish by responding violently to an insult: After all, violence does not really refute criticism in any meaningful way [...]." (p. 29). On that note, Vazire & Funder (2006) have suggested that there is no conscious decision on the narcissists' part. Similar to Paulhus and Levitt's suggestion of automatic egotism, Vazire and Funder propose that aggression in narcissists is driven by extreme impulsivity and inability to control their reactions. Ironically, this lack of self-regulation tends to further interfere with the attainment of recognition and status that they desire (Vazire & Funder, 2006).

Regardless of possible motivation, studies such as those mentioned above have shown clear connections between aggression and narcissism in particular in reaction to rejection (Baumeister, Bushman, & Campbell, 2000; Vazire & Funder, 2006). However, very little is known about the underlying mechanisms of these reactions, including what physiological responses narcissists experience when dealing with negative interpersonal

reactions. Considering the increased emphasis on neurobiological bases of behavior (Glannon, 2011), understanding narcissists' autonomic reactivity while receiving negative feedback could help clarify whether as Paulhus and Levitt (1987) or Vazire and Funder (2006) propose narcissists' reactions are "automatic" or the result of conscious efforts to regulate an unstable self-esteem. The purpose of this study is to explore the relationship between narcissism and autonomic responses to personal feedback. This information could help better determine whether narcissism is a disinhibitory disorder characterized by a pattern of "immediate gratification at the expense of long-term and more enduring gains" and an inability to "control such inclinations as a means of avoiding long-range discomfort" (Gorenstein & Newman, 1980, p. 302).

CHAPTER TWO: LITERATURE REVIEW

Disinhibition is defined as the “disruption of active inhibitory processes regulating tendencies to respond” and refers to human behavior that “has been interpreted as arising from lessened controls on response inclinations” (Gorenstein & Newman, 1980). Narcissism, even in non-clinical samples, has similar features as disinhibitory behaviors and disorders such as substance abuse, psychopathy, antisocial personality disorder, and even hyperactivity in children. Overall, narcissists are characterized by inability to withhold impulsive behaviors including aggression.

Narcissism and Aggression

One disinhibitory aspect of narcissism is aggression. As early as 1932, Freud wrote that the narcissist’s ego has “a large amount of aggressiveness at its disposal” and Kohut (1972) coined the term “narcissistic rage” to describe the relationship between aggression and narcissists’ grandiosity and entitled expectations. Clinical and experimental studies have linked narcissistic traits to various forms of aggression including domestic violence (e.g. Simmons, Lehmann, Cobb & Fowles, 2005; Rothschild, Dimson, Storaasli & Clapp, 1997), and sexual coercion among both genders (Bushman, Bonacci, Van Dijk, & Baumeister, 2003; Ryan, Wikel, Sprechini, 2008).

Modern conceptualizations of narcissism have suggested several hypotheses regarding what motivates a narcissist to continually seek confirmation from others and then react aggressively when their feelings of grandiosity are not reinforced. Morf and Rhodewalt (2001) suggest that while narcissists typically have no concern for others, they need others to help bolster their self-esteem. The constant and “repeated self-regulatory thoughts, feelings, and behaviors” of these individuals are designed to provide needed reassurance that staves off feelings of inadequacy as well as to help define his or her identity (Morf and Rhodewalt, 2001). However, the ultimate goal of a narcissist, the grandiose self, is impossible. The narcissist will inevitably encounter failure and social rejection as well as the reality that the confirmations they do receive are usually a result of their “heavy-handed manipulations” (Morf & Rhodewalt, 2001, p. 179). This mixture of the need for interpersonal reinforcement combined with a narcissist’s lack of empathy and acknowledgement of others is possibly the ultimate “narcissistic paradox” (Morf & Rhodewalt, 2001, p. 179) as they destroy the very relationships upon which their self-esteem depends.

Additionally, Baumeister et al. (2000) proposed that inflated, narcissistic views of the self are “a major cause of violence” -ranging from youth gang activity to genocide- when these egotistic views are challenged or “threatened” (p. 8). Baumeister et al’s

(2006) proposal is supported by experimental studies showing that narcissistic individuals experience more anxiety, anger, and lower self-esteem than control participants in response to perceived personal failure, and are more aggressive after receiving such “ego threats” (e.g. Bushman & Baumeister, 1998; Rhodewalt & Morf, 1998; Stuckey & Sporer, 2002). These findings suggest that narcissists become angry and engage in *reactive* aggression in response to a perceived provoking event. Bushman & Baumeister (1998) proposed that narcissists’ tendency to react aggressively is the result of an unstable concept of self-worth and that it is not just the level of self-esteem that matters, but also the *stability* of that self-concept. In support of this proposal, studies have found that individuals with high, yet stable self-esteem reported the lowest tendency toward hostility and anger, while those with unstable self-esteem reported the highest tendency toward aggression (e.g., Kernis, Grannemann, & Barclay 1989).

Unstable Self-Esteem

Early influential theoreticians Kohut (1966, 1977; Kohut & Wolf, 1986) and Kernberg (1975) differed in their overall views on narcissism but agreed that the narcissist has defensively created an outward façade in an attempt to conceal feelings of insecurity and low self-regard. The idea that narcissists are cognitively aware of their deficits, yet try to conceal those concerns from others and that have their level of self-

worth grounded in the perceptions of others is supported by studies that have found significant correlations between narcissism and instability of self-esteem (Rhodewalt, Madrian, & Cheney, 1998). Those with stable self-esteem may be indifferent to the negative feedback of others while, those with unstable self-esteem are much more sensitive to ego threats and become defensive and hostile (Bushman & Baumeister, 1998, see also Kernis, Cornell, Sun, Berry, & Harlow, 1993).

Brown and Bosson (2001) suggest that there are two aspects to a narcissist's self-evaluation: self-love and self-loathing. Specifically, they suggest that narcissists have both high and low self-esteem simultaneously in different forms. They suggest that individuals with narcissism exhibit high *explicit* (self-reported, conscious) self-esteem, and low *implicit* (automatic, unconscious) self-esteem (Brown & Bosson, 2001). Therefore, narcissists may experience dramatic fluctuations in self-esteem based upon their successes, failures, and interpersonal feedback (e.g. Rhodewalt, Madrian, & Cheney 1998; Rhodewalt & Morf, 1998; Rhodewalt, Tragakis, & Hunh, 2001). This view is consistent with the concept of 'unstable' self-regard proposed by Bushman & Baumeister (1998; see also Kernis, Grannemann, & Barclay, 1989; Kernis, Cornell, Sun, Berry, & Harlow, 1993).

Automatic Egotism

In 1987, Paulhus and Levitt suggested that narcissists' egotism is automatic and set out to determine whether or not socially desirable responses increased when viewing "affect-laden" words (e.g. a word such as *death*). Participants were asked to look at a computer and respond with either "me" or "not me" (by pressing the *M* or *N* key on the keyboard) to trait adjectives (e.g. kind, aggressive, outgoing) that were presented on the screen. The stimulus was first presented as the only adjective on the screen. Then, a distractor word (a second word, being either affect laden or neutral) was included on the screen, appearing in the background. The participant was told to disregard the distractor word and only focus on the main trait adjective. The researchers found that the frequency and speed of endorsement of positive traits as well as the denial of negative traits were increased and done more quickly with the presence of an affective 'distractor' word included on the screen instead of a neutral 'distractor' word being present. The increase in speed suggests intercession by a fast-acting autonomic arousal mechanism, indicating that narcissists' egotism may be automatic and therefore could only be inhibited by intentional self-regulation (Paulhus & Levitt, 1987).

Addiction Model

Baumeister and Vohs (2001) responded to Morf and Rhodewalt's proposal that narcissist's dependency on others for reinforcement was due to a lack of parental

empathy or neglect as a child, by suggesting instead, that narcissism can be seen as a form of addiction. Baumeister and Vohs point out that as with other addictions, narcissism is also characterized by a pattern of constantly yielding to inner urges that result in costly consequences and self-destructive behaviors. This first hallmark of addiction, *cravings*, is quite easy to tie into narcissism. Narcissists seem exceptionally susceptible to falling to the desire to be well regarded and admired. An addict yields to cravings in order to gain a physical pleasure such as a high. With narcissism, the focus of their cravings is to reinforce their inflated self-perception while the medium to gain this pleasure is the positive regard of others (Baumeister & Vohs, 2001). Parallels can also be drawn between addiction and narcissism with regard to *tolerance*. In addiction, tolerance is the idea that once the individual becomes accustomed to a certain level or intensity of a drug, he or she will need more in order to obtain the same feeling. Because narcissists require constant reinforcement from others, their amount of self-regard continues to increase and they require greater and greater amounts of admiration (Baumeister & Vohs, 2001). A parallel with the final hallmark of addiction, *withdrawal* is also apparent and is commonly where the aggressiveness of narcissism emerges. When negative feedback is received, narcissists experience significant distress. Reactions can be aggressiveness,

argumentativeness, or socially undesirable behaviors (Bushman & Baumeister, 1998), which is similar to what is seen when addicts are deprived of their drug of choice.

Whether narcissism is an attempt to fill an emotional void, an impulsive craving the individual cannot ignore, or a result of unstable self-perceptions and esteem, the question may be answered by determining whether or not the narcissist is making automatic or conscious decisions by examining autonomic responses to negative feedback. Of note, autonomic responses, such as electrodermal (skin conductance, SC) measures, have previously been used as a biomarker for other disinhibitory disorders such as psychopathy and addiction (e.g. Taylor, 2004). Therefore, if the hypothesis that narcissism is a form of addiction is correct, the two should share similar physiological markers.

Skin Conductance and Narcissism

Skin conductance (sweat gland activity, SC) has been shown to increase in response to threats of punishment and can be interpreted as an indicator of low anxiety, fear, and sensitivity to punishments. It has also been proposed to be a reliable indicator of emotional and behavioral inhibitory control, which is, theoretically, a major contributor to both narcissism and addiction (Baumeister & Vohs, 2001; Fowles, 2000; Vazire & Funder, 2006). Considering all of these factors, the use of SC in determining the

underlying biological responses individuals with narcissism would thus be productive because it can be used to operationalize and measure emotional response.

In studies on conditioning to punishment, individuals with alcohol abuse disorders displayed decreased reactivity to threats of punishment (e.g. unpredictable blasts of white noise) (Taylor, 2004). If narcissism follows the same physiological patterns as substance use disorders, this would suggest that a narcissist would also exhibit decreased skin conductance responses to threat. Furthermore, these diminished physiological reactions have been shown to persist across a range of procedures as well as unconditioned stimuli (UCSs), including loud noises, shock, or simple mental tasks, which signal approaching punishment (Fowles, 1994).

Fowles (1994) suggested that low SC reactivity could denote weakness in the behavioral inhibition system (BIS), a neurological structure that purportedly reacts to cues for punishment. An individual with a weak BIS would be overly pleasure seeking and disregard potential punishments or consequences (Fowles, 2000). Therefore the excessive impulsivity and seeking of pleasure through reassurance and admiration associated with narcissism could be attributed to a weak BIS (Vazire & Funder, 2006) but this theoretical proposal remains untested. Therefore, if this study can find evidence of narcissists' exhibiting low SC reactivity, it will support previous hypotheses that

behavioral reactions to ego threats are “automatic” as a result of weak BIS, non-conscious responses and perhaps similar to the impulsivity that underlies addiction.

To date, only three studies have looked at physiological correlates of self-reported narcissism (e.g. Kelsey, Ornduff, McCann, & Reiff, 2001; Kelsey, Ornduff, Reiff, & Arthur, 2002; Sylvers, Brubaker, Alden, Brennan, & Lillienfeld, 2008). Kelsey and colleagues (2001) examined the relationship between narcissism and psychophysiological responses in 40 undergraduate men while in a follow up study, Kelsey, Ornduff, Reiff, & Arthur (2002) investigated the same relationship in 57 undergraduate women. In 2008, Sylvers, Brubaker, Alden, Brennan, & Lillienfeld extended the previous research by looking at psychophysiological correlates of both narcissism and antisocial personality features in a college population as well as adding an emotionally evocative task. Both the Kelsey et al. (2001, 2002) studies as well as Sylvers et al. (2008) study examined these individuals’ autonomic responses to adverse stimuli – during an active and a passive coping task. In the passive coping task, an adverse stimulus such as a loud noise blast would occur, unavoidably, at the end of a countdown. However, in the active coping task, the occurrence of the stimulus was avoidable by the simple motor response of pressing a key on a numeric keypad in front of them (Kelsey et al., 2001). In all three studies, researchers found that individuals who had scored high on a measure of narcissism

(Narcissistic Personality Inventory, NPI) consistently showed decreased SC reactivity during the active and passive coping tasks.

While these studies have helped shed light on the physiological responses individuals with narcissism have to adverse stimuli, they still do not address how these individuals physiologically react to negative *interpersonal* responses, which is required to understand narcissists' reactions to social rejection or exclusion. This study examines whether individuals with narcissistic traits have corresponding levels of autonomic responses that would be expected in response to negative personal feedback.

CHAPTER THREE: HYPOTHESES

Based on previous research, it is predicted that:

- 1) Consistent with findings from Kelsey et al. (2001, 2002) and Sylvers et al. (2008) Narcissism will be associated with decreased SC during the passive coping task suggesting weak BIS activation.
- 2) This pattern of reactivity will continue while waiting to receive ego-threatening feedback, but it will reverse after receiving feedback suggesting increased physiological reactivity in response to negative feedback.
- 3) Because the pattern of narcissistic behavior so closely follows that of addiction (e.g. Taylor 2004) and because impulsivity is a major characteristic of a narcissist's behavior, we expect narcissism will also be related to lower self-reported BIS activity.

CHAPTER FOUR: METHOD

Some of the data that was collected during the initial study (e.g. feedback to ‘opponent’) may not be discussed in this paper, as the focus of this study is to explore the relationship, if any, between an individual’s autonomic responses (e.g. -skin conductance) to negative personal feedback, or “ego threat,” and outward, observable behaviors.

Participants

Participants for a laboratory study were selected from a mass screening of 5,733 students (3,405 women) enrolled in introductory psychology for which they received class credit for participation. The mass screenings were conducted at the beginning of each semester from fall 2006 to spring 2008. Eligible participants were excluded if they had a self-reported history of hearing loss or head trauma resulting in unconsciousness and/or coma (which could affect psychophysiological measurements). A total of 122 participants (63 women) were selected for the laboratory study and received 2.5h of research participation credits or \$20 for their time. The mean age of the laboratory study sample was 19.26 ($SD = 1.10$), and the self-reported racial and ethnic composition was 5.7% Asian, 6.6% Black/African American, 13.9% Hispanic/Latino, 1.6% Native

Hawaiian/Other Pacific Islander, 66.4%, White/Caucasian, and 5.7% Other (mixed ethnic background or other category not specified), largely consistent with the overall ethnic and racial composition of the larger screening sample.

Measures

Demographic data. Participants completed a general information form collecting the following demographic data: gender, date of birth, year in school, academic major, and race/ethnicity.

Narcissism. The NPI was developed to explore individual differences in narcissism in non-clinical populations (Raskin & Hall, 1979). The NPI consists of 40 true-false statements that reflect narcissistic sentiments (e.g., “I find it easy to manipulate people” and “Everybody likes to hear my stories”) and is perhaps the most widely researched and well validated measure of narcissism (Raskin & Terry, 1988). Cronbach’s alpha for the total NPI for the laboratory sample was .82. Cronbach’s alpha for the NPI-Adjustment (NPI-Adj) scale scores in the laboratory sample were .57 and .78, respectively. These internal reliability scores for NPI-Mal and NPI-Adj were almost identical to those obtained by Dickinson and Pincus (.59 for NPI-Mal and .80 for NPI-Adj).

BIS measures. Two methods were used to assess BIS levels:

SPSRQ. The Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ; Torrubia, Avila, Molto, & Caseras, 2001) was developed to tap BIS functioning and it consists of 24 yes/no statements that comprise the Sensitivity to Punishment scale and 24 that comprise the Sensitivity to Reward scale. Internal consistency reliabilities for the Sensitivity to Punishment and Sensitivity to Reward scales for laboratory study participants were .82 and .74, respectively. Finally, the Sensitivity to Punishment and Sensitivity to Reward scales were significantly inversely related to each other ($r = -.20, p = .05$).

Skin conductance. Skin conductance reliably increases in response to threats of punishment and it has been used as an indicator of BIS activity (Fowles, 1980; 2000). In this study, we used average SC level in anticipation, and SC responses in response to an aversive sound during a countdown procedure, as an objective measure of BIS activity (see Procedures section for a detailed description of this task).

Procedures

Eligible participants were asked not to use alcohol or illicit drugs within 24 hours of their scheduled study session time. Once in the laboratory, participants provided informed written consent. As the participant completed the consent form, the experimenter checked on the “other person” (nonexistent), whom the participant was led

to believe was of the opposite gender, had arrived earlier, and was working on a computer task in a different room. The purpose of the cover story was to add realism to the experiment by conveying to the participant that they would be interacting with another participant throughout the study. Once participants completed the consent form, the experimenter took their photograph (to be used on an ego threat paradigm explained below) and led them to a room with a computer where the rest of the tasks were completed. Since participants would be connected to psychophysiology equipment that would restrict their movement, they first completed the paragraph writing, self-report, and decision-making tasks to minimize discomfort. The outlined order of the tasks also ensured large amounts of data would be collected early in the study in case subjects were not able to complete latter portions of the lab session, and maintained the illusion that the experimenter was tending to another person while participants worked independently. As detailed below, the reactive aggression and grading tasks were counterbalanced.

Paragraph writing. For the first task, a version of the ego threat paradigm used by Bushman & Baumeister (1998) was adapted in which narcissistic participants displayed high reactive aggression after receiving negative feedback on their writing style on a brief essay. In the current study, participants were instructed to type on the computer a one-paragraph “personal ad” (such as might be found in an online dating service) listing

their qualities and attributes. Participants were told to put forth their best effort because they would later receive feedback from the other “participant” on their writing style as well as “how attractive” they portrayed themselves in the ad. In addition they were informed that they would receive feedback on the attractiveness of their digital photograph taken earlier. Participants were told that they would also have the opportunity to provide feedback to the other “participant” on their ad and physical appearance. After completion, participants were told that their essay and photograph would be “placed on the server” to be graded later by the other participant. It is this feedback that was used as artificial negative feedback while physiological reactivity was measured.

Self-reports. After participants finished writing their ad, they completed the self-report questionnaires via computer (demographic data, NPI, and SPSRQ).

Psychophysiological assessment. For the psychophysiological tasks participants washed their hands with warm water and Ivory liquid soap and cleaned the lower eye lid where the EMG electrodes were placed. The areas where SC, EKG and EMG electrodes were placed were also swabbed with rubbing alcohol and the EKG (wrists) and EMG (lower eye lid; forehead) sites were lightly abraded with a plain gauze pad. Skin conductance reactivity data was collected using silver-silver chloride (Ag-AgCl) electrodes fitted with collars (8mm diameter opening) and filled with commercially available electrode paste

placed on the participants' distal phalanx of the index and middle fingers on their non-dominant hand. Skin conductance was recorded through two DC amps connected to separate 24-bit digitizing skin conductance couplers from Contact Precision Instruments (P.O. Box 425605, Kendall Square, Cambridge, MA 02142). The system uses constant 0.5-V electrode excitation as specified by Lykken and Venables (1971).

After electrode placement, participants were taken to the same temperature controlled computer room where they completed prior measures. The room was equipped with a microphone for communication, a video camera for monitoring participation, and a computer monitor for visual stimulus presentations. Stereo headphones were placed on the participant for communication and presentation of auditory stimuli and the lights of the room were turned off during the procedures in which psychophysiological data was collected. Prior to beginning psychophysiological recordings, participants were asked about their food, drug, nicotine, and caffeine intake in the past 24 hours to provide information on things that could affect physiological data (e.g., in the case of outliers).

Relax task. Baseline SC levels were collected for 500 s as participants were asked to sit with their eyes closed and relaxed. No stimuli were presented during this task. This task was included to allow participants to acclimate to the room and to the

testing situation and, as such, always preceded other psychophysiological tasks. Data collected during this task were not analyzed for the present study.

Blast task. After the baseline period, participants were asked to sit with their eyes closed and wait for a loud noise (an unpredictable 2 s 110 dB blast of white noise). The noise sounded half-way through the 90 s task. This task was used to introduce the participant to the aversive stimulus central to the passive coping task. SC data was collected during this task but were not examined for this report.

BIS Functioning-Passive coping task. After the aversive stimulus had been introduced, the passive coping task began. The SCR and skin conductance level (SCL) data collected during this task were examined in order to assess BIS functioning objectively. Recorded instructions asked participants to remain as calm as possible as they saw a countdown on the screen from 10 to 0 and informed them that when the countdown reached 0, they would again hear the previous loud noise, and they should try to ignore it. Each number was presented for 3 s with 1 s between numbers. A built-in delay in the start of the task resulted in a total time of 45 s to complete the countdown and reach 0 (blast onset). Skin conductance response amplitude was defined as the difference (in μ siemens) between the SCL preceding the response and the level at the peak of the response. The SCR was scored from a 10 s window starting at blast onset.

The SCL during anticipation of the blast in the passive coping task was calculated by averaging all data points during the countdown period (45 s) before the blast of noise.

Feedback task. The participant's attention was directed to a computerized countdown (from 10 to 1) on the top part of the computer screen and then to a message in the middle of the computer screen saying: "On a scale from one to ten, with "1" being "Extremely poor" and "10" being "Excellent", the quality of the writing in your ad was given a rating of: " ". Participants were told when the countdown reached the number "1" their rating would appear under the message in the middle of the screen. All participants received a favorable score of 8 (ego boost) on the rating of their writing. The purpose for providing an ego boost was two-fold. First, it was included to enhance the idea that the task was real by first providing participants with a rating in the range of what they would likely be expecting. That is, if the ad writing component was given a negative score, the participant might become suspicious of the manipulation by the third trial (photograph rating). The second purpose was to collect data to explore possible significant differences in physiological reactivity between groups to personally relevant and rewarding stimuli (i.e., positive personal feedback).

After the ego boost trial, all participants were provided with two negative feedback trials (ego threats) related to the attractiveness of their ad and their photograph.

We used ego threats based on the participant's ad and physical attractiveness because, arguably, it may be viewed as particularly threatening by narcissistic participants compared to writing ability. The previously described procedure was used for giving feedback on the participants' ad appeal and physical attractiveness. For the ad, the message in the middle of the screen said "On a scale from one to ten, with "1" being "Not attractive at all" and "10" being "Extremely attractive", you were given a rating of: " " and an assigned unfavorable score of "2" appeared at the end of the countdown. For physical attractiveness, the message in the middle of the screen said "Based on your photograph, on a scale from one to ten, with "1" being "Not attractive at all" and "10" being "Extremely attractive" you were given a score of: " " and an assigned score of 3 was provided. Skin conductance data were collected during each of the three feedback trials as previously mentioned.

Grading task. After receiving the feedback on their ad writing quality (ego boost) and attractiveness of their ad and photograph (ego insults), participants were told that they would now provide a grade for each of "the other participant's" ad writing quality, ad attractiveness, and photograph's attractiveness. After they provided that rating, the ad remained on the screen and participants were asked to provide ratings on its attractiveness. Finally, the photograph appeared and participants gave ratings for the

confederate's physical attractiveness.

Debriefing. After the reactive aggression task, participants were disconnected from the psychophysiological equipment and electrodes were removed. Participants were then taken to an interview room where they were fully debriefed and allowed to ask questions. During debriefing, the experimenter assessed participants' level of belief of the study's cover story by gauging their reaction while being told of the deception and by participants' self-reports on their belief of the deception. The experimenter assigned a score of zero (did not believe deception at any time), one (believed but expressed some suspicion at debriefing), or two (completely believed it) on a rating scale in the debriefing form. Research participation was logged and a receipt for participation or money was given to the participant according to their preference.

Analyses

Correlation analyses. Primarily correlation analyses were run in order to establish if there is a relationship between SPSRQ (paper and pencil BIS measures) and narcissism. Then baseline SC (BIS) and narcissism was examined in an attempt to replicate the Kelsey et al. studies that showed individuals high in narcissism exhibited decreased baseline SC levels. Following this, another set of correlations were conducted

with SC reactivity at the different feedback instances before, during, and after receiving the ego-threat in order to determine if they were related to narcissism scores.

Regression analyses. An alpha level of .05 was used to evaluate significance in the regression analyses. If the correlations between SPSRQ and SC reactivity during baseline, or in response to feedback and narcissism were significant, a regression analysis was performed. This was to determine whether the SPSRQ (cognitions) or SC (physical automatic reactions) in response to the negative feedback could be used to predict narcissism scores. In these analyses, the intention was to run SC reactivity levels at three different instances: in anticipation of feedback (waiting to hear their photograph rating), when receiving feedback (both for the paragraph writing test and feedback on attractiveness), and finally after receiving feedback (also after both the paragraph and photograph feedback).

CHAPTER FIVE: RESULTS

Initially, the intention was to run analyses using three different feedback instances (in anticipation for feedback, when receiving feedback, and after feedback). However, when the correlation analyses were run, these variables were very highly correlated (positive pre-feedback mean SCL and negative pre-feedback SCL, $r = .996, p = .000$; positive pre-feedback mean SCL and pre-feedback mean SCL $r = .998, p = .000$; negative pre-feedback SCL and pre-feedback SCL $r = 1.000, p = .000$) such that individuals' autonomic reactivity did not differ between tasks. In order to reduce redundancy, only the pre-feedback mean SCL (taken during the passive coping task) was used. This measure was chosen due to the fact that it was more strongly correlated to the narcissism measures than were the other SC feedback instances. Table 1 displays the descriptive statistics and results of these initial correlational analyses.

Table 1

Summary of Means (and Standard Deviations) and Correlations Between Measures

	1	2	3	4	5	6	7
1) Mean SCL	5.52 (2.88)						
2) Sensitivity to Punishment	.199*	32.41(4.95)					
3) Sensitivity to Reward	-.044	-.203*	38.17 (4.09)				
4) NPIMal Total	-.085	-.165	.481**	5.84 (2.21)			
5) NPIAdj Total	-.212*	-.509**	.362**	.595**	16.75 (4.14)		
6) NPITotal	-.188*	-.436**	.443**	.804**	.956**	22.58 (5.68)	
7) SC Reactivity	.485**	.045	-.130	-.125	-.119	-.107	.191 (2.89)

Note. Means and standard deviations of the variables are reported on the diagonal. NPI = Narcissistic Personality Inventory; NPIMal = NPI- Maladjustment scale; NPIAdj = NPI-Adjustment scale; SC Reactivity = (SCR) refers to the mean skin conductance reactivity levels taken during the negative feedback task; Mean SCL = refers to average skin conductance levels taken during the passive coping task and later referred to as pre-feedback SCL.

* $p < .05$; ** $p < .01$

Tests of Hypotheses

Hypothesis 1. It was predicted that narcissism would be associated with decreased SC activity during the passive coping task, thus suggesting weak BIS. Results revealed that, consistent with hypothesis, participants' pre-feedback SCL was significantly negatively related to the NPI-Adjustment score as well as the individual's overall NPI score. This indicates that individuals higher in traits characterized by the desire to be and enjoying being a leader, narcissistic tendencies such as admiring oneself in the mirror, and core feelings of superiority and grandiosity (Emmons, 1984) were associated with decreased physiological reactivity in anticipation to ego-threat, suggesting weak BIS reactivity. However, the score on the NPI-Maladjustment scale (which includes items related to the Exploiteness/Entitlement subfactor) was not significantly related to the SCL levels during the passive coping task (Table 1). This scale, which is characterized by strong tendencies toward manipulation and exploitation, is also associated to characteristics such as suspiciousness, anxiety, and dominance (Emmons, 1984).

Hypothesis 2. Decreased SC reactivity was predicted to continue while the individual waited to receive feedback, however, this pattern was expected to reverse after receiving the ego-threatening feedback. Results from initial correlations revealed that

while the relationship between the skin conductance reactivity (SCR) and NPI measures trended toward a negative relationship, all of the correlations failed to reach significance (See Table 1).

Hypothesis 3. It was predicted that narcissism would be related to lower self-reported BIS. Results revealed that the Sensitivity to Punishment score was significantly negatively related to the NPI-Adjustment score, as well as to the NPI total score (Table 1). However, it was only marginally significantly related to the NPI-Maladjustment score (see Table 1). The Sensitivity to Reward total score showed significant positive correlations with the NPI-Maladjustment score, the NPI-Adjustment score, as well as with the NPI total score (see Table 1).

Regression analyses were then conducted to determine if significant SCL and SPSRQ scores significantly correlated to narcissism could be used to predict scores on the NPI. The results of the regression analyses are presented in Table 2.

First, the NPI total score was used as the dependent variable with the Sensitivity to Punishment (SP), Sensitivity to Reward (SR), and pre-feedback mean SCL as simultaneous predictors. The model was significant. Both Sensitivity to Punishment and Sensitivity to Reward were significant in the model. The pre-feedback mean SCL was not significant in the model.

Another model used the NPI- Maladjustment scale as the dependent variable.

Although the Sensitivity to Punishment scores were only marginally correlated with NPI- Maladjustment, it was included in the regression in order to determine if it accounted for any of the variance along with Sensitivity to Reward scores. The results were significant, but the Sensitivity to Punishment score failed to reach significance in the model ($p = .388$). Finally, NPI-Adjustment scores were used as the dependent variable, using pre-feedback SCL, Sensitivity to Punishment, and Sensitivity to Reward scores. This model accounted for a significant amount of variance in NPI scores, with the Pre-feedback SCL failing to reach significance ($p = .171$). However, both Sensitivity to Punishment and Sensitivity to Reward were significant.

Table 2

Predictors of NPI and NPI subscale scores

Predictor	Outcome Variable					
	NPI Total		NPI-Maladjustment		NPI Adjustment	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Mean SCL	.31**		.24**	--	.25**	
SR		-.10				-.11
SP		.30**		.47**		.22**
		.35**		-.07		-.45**

Note. SCL = skin conductance level; SR = Sensitivity to Reward scale on the SPSRQ; SP = Sensitivity to Punishment scale on the SPSRQ. The dash (--) indicates that this variable was not used as a predictor in the regression using the NPI-Maladjustment scale as the dependent variable, as they were not significantly correlated.

* $p < .05$. ** $p < .01$

CHAPTER SIX: DISCUSSION

The present study aimed at determining if physiological reactivity in individuals high in narcissism correlate with the typical outward behaviors seen in response to ego-threatening feedback. This information could help determine if any previously proposed hypotheses of narcissism, such as unstable self-esteem (e.g. Rhodewalt, Madrian, & Cheney, 1998; Bushman & Baumeister, 1998; Brown & Bosson, 2001) or that narcissism is biologically similar to addiction (Baumeister and Vohs, 2001), are further supported by biological reactions. Finally, self-report measures of BIS were examined to determine if lower scores would correlate with those seen in individuals with addiction (e.g. Taylor, 2004).

The present findings revealed that, in accordance with previous studies (e.g. Kelsey et. al, 2001, 2002; Sylvers et. al, 2008) increased levels of narcissistic traits, as measured by the NPI, are associated with decreased skin conductance activity during the passive coping task, suggesting weak BIS. More specifically, individuals high in the Superiority/Arrogance, Leadership/Authority, and Self-Absorption/Self-Admiration subscales on the NPI (NPI-Adjustment scale), show decreased baseline SC activity. This is consistent with findings that individuals with weak or lowered BIS are typically

pleasure seeking and disregard potential consequences (Fowles, 1994, 2000), – typical behaviors seen in individuals with narcissistic traits. This may not have applied in the case of the NPI-Mal scale due to the typically lower Cronbach's alpha (.57) found with this scale.

These results suggest that decreased BIS activity in the face of negative interpersonal feedback among narcissistic individuals could account for their aggressive behaviors in response to ego-threat. As previously stated, individuals high on the NPI-Adj scale typically rate themselves as high in self-esteem (Emmons, 1984; Watson & Biderman, 1993). However, consistent with the theories of Rhodewalt and Morf (1998), if this self-reported esteem is threatened, these individuals could experience dramatic fluctuations in self-evaluation and thus become defensive, hostile, and disregard possible punishments in an attempt to reaffirm their status (e.g. Bushman and Baumeister, 1998).

It was hypothesized that individuals high in narcissism would exhibit lower SCR while waiting to receive feedback but then display a large spike in SCR after receiving an ego-threat. This hypothesis was unsupported by the data. While the initial decrease in SCR was consistent with lowered behavioral inhibitory control and the first hallmark of addiction (cravings), the findings in this study do not maintain the idea narcissism that parallels the withdrawal hallmark of addiction. Since the withdrawal stage is where

aggressiveness is typically observed in both narcissism and addiction (Bushman & Baumeister, 1998), physiological reactivity would be expected to increase after receiving the ego-threat, just as it does when an addict is refused the drug. In other words, the observable distress and aggression typically seen when someone high in narcissism suffers an ego-threat was not paralleled by the physiological reactivity data collected.

When looking at SCL in anticipation of feedback and at self-reported BIS, the results of the current study seemed to support the idea of narcissism as a form of addiction. Patterns of impulsivity and disregard for consequences have been repeatedly observed in individuals with addiction as well as narcissism (e.g. Taylor, 2004; Fowles, 2000). However, the NPI-Maladjustment scale was only significantly related to the Sensitivity to Reward scale on the SPSRQ and NPI scores were not reliable indicators of decreased skin conductance activity. This study suggests that both the self-reported BIS and SCL findings point in the same direction, indicating that narcissism has the same motivational patterns as do addictions, whether by self-report or biological, skin conductance measures.

Limitations and Future Directions

The current study had some limitations. The sample was taken from a college population in which was a sample of convenience and may not accurately represent

narcissism levels in the average population. While the mass screening aimed at remedying issues resulting from this, future studies should aim to include individuals who demonstrate clinical levels of these traits. This would aid in determining if biological reactivity in response to ego threat differs in individuals who are diagnosed with Narcissistic Personality Disorder versus a non-clinical population. Overall, the results of this study support the idea that narcissism and addiction display similar features.

Individuals with increased levels of narcissistic traits also tend to have lowered SC levels, indicating a weakened behavioral inhibition system (BIS) that may account for some of their impulsive, dismissive behaviors. Further, the current study also maintains the idea that an individual's scores on the SPSRQ can be a reliable predictor of his or her scores on the NPI and its subscales. On the other hand, when looking at Sensitivity to Reward, higher scores on the NPI and either of its subscales would indicate increased awareness and desire for reward. This is congruent with typical narcissistic patterns of behavior.

Future studies should examine further data on SC and other physiological responses that correlate with threats of punishment, such as heart rate. By examining both, researchers could determine whether the behaviors seen in narcissistic individuals is at least in part driven by underlying physiological reactions.

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