How do you solve a problem like my envy?

Self-affirmation as a potential envy-reducing intervention

by

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Abstract

Envy is a toxic emotion detrimental to one's health and wellbeing (Smith, Combs, & Thielke, 2008), yet few studies have suggested and none have evaluated possible envy-reducing strategies. Self-affirmation has been shown to reduce the impact of self-integrity threats and defensive processing (Cohen & Sherman, 2014), suggesting likely benefit when applied to envy. The present study ($N = 209$) examined whether completing a brief self-affirmation value essay (Cohen, Aronson, & Steele, 2000) attenuated student participants' self-reported envy feelings and potentially envy-motivated aggressive behaviour (non-cooperation) toward an ostensibly smarter and financially advantaged rival student in the laboratory, relative to a no-affirmation control condition. A one-month follow-up study ($N = 169$) investigated whether the self-affirmation intervention (vs. control) promoted durable effects in daily life, such as when recalling an intense past-month instance of envy. Potential mediators (self-construal, mood) were examined to illuminate mechanisms underlying self-affirmation effects. Prospective moderators (dispositional envy, self-compassion, vulnerable and grandiose narcissism, self-esteem, entitlement, and sex) were assessed to determine whether individuals most psychologically vulnerable to envy threat derived greater benefit from the intervention. Results demonstrated that self-affirmation significantly curbed students' self-reported envy feelings toward an advantaged rival relative to controls, particularly for students with elevated dispositional envy or low dispositional self-compassion. Affirmed participants also reported greater use of two recommended coping strategies in daily life and having found these to be more helpful, relative to controls. However, self-affirmation did not promote higher rates of cooperation with a rival student or insulate students against experiences of envy at one-month follow-up. Overall, the findings support the utility of a brief self-affirmation intervention in reducing situational feelings of envy. Research

considerations involving assessment and reduction of potentially envy-driven behaviours,

promoting durable self-affirmation effects, and investigate intermediary variables to explain

treatment effects are discussed. Future directions for self-affirmation research are proposed for

social and clinical psychology domains.

Keywords: self-affirmation, envy, narcissism, cooperation, self-compassion

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In the sea of malice envy frequently gets out of her depth; and whilst she is expecting to

see another drowned, she is either drowned herself or dashed against a rock.

-Giovanni Battista Basile, 1637/1847

Envy has been recognized as a potent destructive emotion throughout human history,

drawing the attention of philosophers and religious authorities who have warned of its dangers

and offered admonishment and advice to the envious (D'Arms & Kerr, 2008; Schimmel, 2008).

Aristotle's *Rhetoric* (trans. 1954) described envy as a painful, solitary experience that is unlikely

to arouse the pity of others. The Catholic Church lists envy (Latin: *invidia*) among its seven

cardinal sins (Catholic Church, 1994). The seriousness with which envy has been viewed

historically is reflected in its presumed consequences. Dante's *Purgatorio* (Alighieri, n.d./1909-

1914), the second poem in his epic *Divine Comedy,* provides a particularly poignant example as

the envious are doomed to have their eyes sewn shut with iron wire for gaining sinful pleasure in

seeing others brought low.

Despite its dark historical reputation, envy has been viewed in a less menacing light in

recent generations (Belk, 2008). Envy has gained widespread usage as a complimentary term

(e.g., "I'm so envious of your new clothes!") alongside its traditional, transgressional meaning

(Silver & Sabini, 1978). Additionally, envy's meaning is further obscured as jealousy becomes

used as a synonym for envy, despite their important distinctions (Smith, Kim, & Parrott, 1988).

Laypersons and experts alike appear confused as to how to define this nebulous emotion (Leach,

2008). As such, defining envy and disentangling the emotion from jealousy is a necessary

endeavor before progressing further.

Defining Envy

Dictionary definitions generally agree that envy entails the lack of some valued object or possession held by another, a desire to possess it, and feelings of discomfort or even pain caused by this disadvantage (e.g., *Merriam-Webster.com*). Leach (2008) argues for a simple definition of envy involving a desire for some object or possession and generalized feelings of anger over one's lack. Other definitions specify additional components to envy, most notably the prevailing definition of envy from Richard Smith and colleagues who write that "envy is an unpleasant, often painful emotion characterized by feelings of inferiority, hostility, and resentment caused by an awareness of a desired attribute enjoyed by another person or group of persons" (Smith & Kim, 2007, p. 47).

Of the three component parts identified by Smith and Kim (2007), hostility has proven the most contentious and led to a distinction between a hostility-free variant of envy (benign envy) and a hostility-infused form (often referred to as malicious envy or envy proper; Smith & Kim, 2007). Malicious envy may be distinguished by its promotion of *leveling down* behaviour: actions intended to pull down or even harm advantaged others and hope for their eventual failure (van de Ven, Zeelenberg, & Pieters, 2009). In contrast, benign envy appears to be linked with *leveling up* behaviour: increased motivation and effort to improve one's position coupled with greater liking and admiration for an advantaged rival and desire to be closer to this person (van de Ven et al., 2009; van de Ven, Zeelenberg, & Pieters, 2011). Subsequent research has suggested that individuals are more likely to experience malicious (vs. benign) envy in situations where another's advantage is perceived as undeserved (van de Ven, Zeelenberg, & Pieters, 2012). These demarcations between benign and malicious envy suggest that the latter emotion is consistent with historical understandings of envy, which may be experienced as intolerable by its

victims and jeopardize important social and even familial relationships. Unless specified otherwise, all subsequent references to envy in this paper reference its malicious form.

Envy may be helpfully distinguished from its related emotion, jealousy. Whereas envy typically involves an upward social comparison with an advantaged rival on a domain central to one's self-concept where one is lacking, jealousy involves the feared loss of an existing relationship with one person to a rival who need not be superior to the self in any important respects (Parrott & Smith, 1993). These emotions frequently co-occur, such as in the case where one fears losing a partner's affection (jealousy) to a more attractive rival (envy). Envy and jealousy may also be distinguished based on their unique characteristic psychological components. While envy may entail feelings of shame, belief in one's relative inferiority, dissatisfaction with the self, and longing for what another has, jealousy is characterized by feelings of betrayal, suspiciousness, disgust, rejection, and loneliness (Haslam & Bornstein, 1996; Smith et al., 1988).

Self-evaluation maintenance model.

As not all upward comparison situations lead to feelings of envy, what situational characteristics promote envious reactions? Abraham Tesser's (1988) self-evaluation maintenance (SEM) theory provides a helpful vantage point for understanding envy and its origins in social comparison. This model posits that individuals are motivated to maintain or enhance a positive self-evaluation, and that self-evaluations are heavily influenced by one's relationships with others. When evaluating our performance relative to another we may engage in one of two dynamic processes: comparison or reflection. The comparison process threatens to decrease one's self-evaluation and encourages emotions such as envy. In contrast, the reflection process involves *basking in the reflected glory* of others and may bolster self-evaluation and promote

emotions such as pride (cf. Cialdini, Borden, Thorne, Walker, Freeman, & Sloan, 1976). Which process occurs depends primarily on the relevance of the comparison domain to one's self-evaluation, while the degree of closeness with the advantaged other determines the impact of the contrast on one's self-evaluation. For example, a close peer's superior exam score or acceptance to grad school would be expected to be highly threatening if one values academics. The same close peer's success in competitive sports would, conversely, be most likely to enhance one's self-evaluation if sports is a low-relevance domain.

The model's predictions have generally been borne out in the research literature (e.g., Tesser & Campbell, 1982; Tesser, 1988). Tesser and Collins (1988) observed that participants experienced the most envy toward an advantaged rival when outperformed on high-relevance domains, as well as the most proud of the other when the advantaged rival succeeded on a low-relevance domain, particularly when they were close to this individual. In addition to domain relevance and closeness, envy also appears to be influenced by the degree of similarity between the envious and envied person as well as the likelihood of attaining the envied person's advantage in the future. When individuals are similar across most comparison domains, little justification exists to explain an advantage one holds over the other (Alicke & Zell, 2008). Smith and Kim (2007) note that envious individuals may believe that an advantage is possible, though unlikely, to be obtained in the future.

Consequences of Envy

Consistent with its disreputable history, a growing body of research has linked envy with important negative health and social consequences, both directly and indirectly via its component parts. While envy is a universally experienced emotion and can be assessed as an episodic state, envy may also be a chronic experience for some individuals. Dispositional envy (Smith, Parrott,

Diener, Hoyle, & Kim, 1999) has been directly linked to important consequences for health and wellbeing. Gold (1996) examined dispositional envy (as measured by his York Enviousness Scale) in relation to the Brief Symptom Inventory (Derogatis, 1983). Dispositional envy was positively correlated with the total scale score as well as each of its factors (depression, anxiety, phobic anxiety, somatization, obsessive-compulsive). Elsewhere, dispositional envy (using the Dispositional Envy Scale) has also been linked to higher levels of depression and neuroticism, as well as lower self-esteem, life satisfaction, and happiness (Smith et al., 1999). Even transient feelings of envy have been linked to psychopathology and dysfunction that include increased depressive and anxious symptoms, hostility, mood disturbance, lowered desire for friendships with advantaged rivals, as well as intentions and actions meant to disparage rivals and harm their reputations and performance (Cohen-Charash, 2009; Salovey & Rodin, 1984).

While few studies have explicitly linked envy to important health consequences, envy may be implicated insofar as its primary components - inferiority, hostility, and resentment - are associated with detrimental health outcomes. Sapolsky (2005) observed that inferior social status conveys important health consequences among primates (e.g., chronic secretion of glucocorticoids, elevated hypertension and cholesterol, and impaired fertility) and notes that this pattern extends to humans in some respects. Envy's focus on chronic inferiority may plausibly contribute to the development of mental disorders such as depression, which the World Health Organization projects will be the second largest cause of disability-adjusted life years worldwide by the year 2030 (Mathers & Loncar, 2006) and has produced an estimated economic burden of $51 billion annually in Canada alone (Lim, Jacobs, Ohinmaa, Schopflocher, & Dewa, 2008). Smith, Combs, and Thielke (2008) suggest that envy may provide a partial explanation for the declining physical health outcomes observed across the socioeconomic gradient. Low-SES

individuals possess an objectively inferior position to others with respect to monetary income. Moreover, low SES has been associated with higher rates of hostility (Barefoot, Peterson, Dahlstrom, Siegler, Anderson, & Williams, 1991), a relationship that is exacerbated when individuals perceive low levels of social integration (Elovainio, Kivimäki, Kortteinen, & Tuomikoski, 2001).

Hostility has been shown to undermine health in various ways. Hostility has been strongly linked to development of coronary heart disease (CHD) morbidity and mortality (e.g., Barefoot, Dahlstrom, & Williams, 1983; Barefoot et al., 1991). This emotion may also explain the link between depression and mortality (Lemogne et al., 2010). Envious individuals may be poor companions due to their hostile, antagonistic interpersonal style (Smith & Kim, 2007). As such, they may be less likely to establish and maintain social relationships and have the necessary social support to cope with challenges. Hostile individuals report having more frequent negative interactions and fewer positive ones (Brondolo et al., 2003). Hostility has also been linked to perceptions of lower social support from others (Keltikangas-Järvinen & Ravaja, 2010) and may experience offers of social support as stressful and fail to benefit from such support (Holt-Lunstad, Smith, & Uchino, 2008; Vella, Kamarck, & Shiffman, 2008).

Psychoanalytic insights into envy, particularly those of Melanie Klein (1957/1975), emphasize that envy may involve actions to harm advantaged others even at a cost to oneself because seeing the envied object destroyed is preferable to seeing another possess it. Envious individuals' willingness to harm envied others is apparent in the research literature on workplace envy, which has demonstrated that envious individuals engage in a variety of harmful counterproductive work behaviours (Cohen-Charash & Mueller, 2007; Kim, Jung, & Lee, 2013; Mancl & Penington, 2011). This may range from passive-aggressive means such as withholding

key information or slowing down correspondence to an envied colleague to gossip, backstabbing and sabotaging this individual's reputation. Such actions may be indirectly costly for the self, such as sacrificed productivity. Envy's potential for harming advantaged others may also be reflected in competitive experimental paradigms. Zizzo and Oswald (2001) observed that a majority of participants were willing to sacrifice potential monetary earnings in order to "burn" a greater proportion of earnings of unfairly advantaged rivals, and speculated that burning reflected envy feelings.

Perhaps unsurprisingly, envious individuals seem to delight in the misfortunes of advantaged others. Both dispositional and episodic envy have been positively linked to the intensity of schadenfreude feelings (Smith, Turner, Garonzik, Leach, Urch-Druskat, & Weston, 1996). Moreover, this malicious pleasure appears to be insensitive to whether or not the envied individual's misfortune was deserved (Brigham, Kelso, Jackson, & Smith, 1997). Indeed, envy's unpleasant mixture of inferiority, ill will, and resentment provide a potent concoction that may prime feelings of pleasure in response to an advantaged rival's misfortune (Smith, Powell, Combs, & Schurtz, 2009).

Narcissism and envy.

One group of individuals thought to be highly susceptible to envy are those with narcissistic personality traits. Indeed, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V; APA, 2013) reaffirmed this relationship by retaining envy as one of nine characteristic symptoms of Narcissistic Personality Disorder (NPD).

Narcissism's close connection to envy is highlighted in clinical accounts of several psychoanalytic scholars, most notably Otto Kernberg (1975; 1984; 2007). Kernberg (1975) suggests that narcissists are highly envious of others who outperform them or possess something

they lack, and that they tend to respond aggressively toward such individuals with contempt and devaluing. Kernberg describes envy as a prototypical self-defeating characteristic of the narcissistic personality. Stemming from experiences of frustration and deprivation in childhood, Kernberg (1995) posited that envy paradoxically leads narcissists to devalue or even destroy the people and objects they desire, leading to experiences of emptiness rather than the satisfaction they seek. Narcissists, he suggested, develop a protective grandiose self to insulate against dependency on others and ward off feelings of envy (Kernberg, 1995). However, when situational comparisons reveal one's inferiority relative to others or narcissists must depend on others, envy is likely to surface. This is perhaps most evident in the therapeutic context, where, from the perspective of the narcissistic client, "there can only be one great person in the room, who necessarily will depreciate the other, inferior one" (Kernberg, 2007, p. 307). As such, narcissistic clients are constantly regulating feelings of envy by idealizing the therapist, claiming the therapist's insights as one's own contribution, and attempting to devalue or even destroy the therapist and/or the therapist's comments (Kernberg, 2007).

The DSM-5 diagnostic criteria for NPD portray narcissists as grandiose, arrogant individuals who hold few qualms about exploiting others for personal gain, possess marked deficits in empathy, and feel entitled to special privileges - descriptors that convey perceived superiority over others. As envy entails perceptions of oneself as inferior to another on important comparison domains (Smith et al., 1999), its inclusion as a diagnostic symptom appears contradictory if envy is understood to be consciously experienced.[1]

However, a growing body of research has suggested that narcissism is not a unitary construct, as the DSM-5 NPD diagnosis suggests. Instead, narcissism may be divided into

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[1] Kernberg (2007) notes that envy may be both conscious and unconscious for narcissistic patients, with the former emerging when they become aware of their dependency on others or qualities that others possess but they lack.

grandiose and vulnerable phenotypic presentations (Cain, Pincus, & Ansell, 2008). While these narcissistic expressions may share core narcissistic characteristics (e.g., exaggerated self-importance, entitlement, and deficits in empathy; Dickinson & Pincus, 2003; Russ, Shedler, Bradley, & Westen, 2008), they can be distinguished by their relations to other constructs. Grandiose narcissism is characterized by high (vs. low) self-esteem and negative (vs. positive) correlations with shame (Pincus, Ansell, Pimentel, Cain, Wright, & Levy, 2009). Miller and Maples (2011) mapped these expressions on general personality traits, reporting that grandiose narcissism was associated with high extraversion and low neuroticism, whereas these associations were reversed for vulnerable narcissism; both phenotypes were associated with low agreeableness. A small body of research has also suggested that these phenotypes differ with respect to enviousness.

Four studies have included measures of narcissism and envy and have produced largely consistent findings despite the use of different scales in the measurement of narcissism and envy (Gold, 1996; Krizan & Johar, 2012; Luglio, 2002; Neufeld & Johnson, 2016). Vulnerable narcissism has displayed moderate to large positive correlations with dispositional envy ($.45 \leq r$s $\leq .75$; all ps $< .01$), whereas grandiose narcissism is generally weakly and negatively correlated ($-.17 \leq r$s $\leq .04$; all ns; Krizan & Johar, 2012; Neufeld & Johnson, 2016). Certain adaptive aspects of narcissistic grandiosity, namely aspirations for leadership and authority, may even be mildly protective against dispositional envy (Neufeld & Johnson, 2016, Study 2). A similar discrepant pattern of findings across vulnerable and grandiose narcissism has been observed when examining envy feelings. Whereas narcissistic vulnerability has been positively correlated

with episodic envy and its components[2], narcissistic grandiosity has tended to be uncorrelated

with envy feelings (Krizan & Johar, 2012; Neufeld & Johnson, 2016). However, dispositional

entitlement - a pervasive sense that one is somehow more deserving of or entitled to resources or

positive outcomes than others and is common to both narcissistic grandiosity and vulnerability

(Dickinson & Pincus, 2003) - appears to promote stronger envy feelings (Neufeld & Johnson,

2016). Feelings of schadenfreude in response to a misfortune suffered by an advantaged (and

presumably envied) - a prototypical consequence of envy (Smith et al., 2009) - similarly appear

to be characteristic of narcissistic vulnerability but not grandiosity (Krizan & Johar, 2012;

Neufeld & Johnson, 2016).

Antidotes to Envy

Alongside the attention given to the problem of envy in the research literature is a focus

on potential antidotes to envious reactions. Self-evaluation maintenance theory (Tesser, 1988)

predicts that envious individuals may reduce feelings of envy by manipulating any of the three

aspects of the model: the quality of one's performance, similarity with the comparison other, and

the relevance of the comparison domain. Envy may be mitigated or eliminated if an individual's

performance improved through practice and additional effort so as to be comparable or even

superior to relevant comparison others. This adaptive response would require identification of

envy feelings and desired objects and/or possessions (Smith & Whitfield, 1983) in order to use

envy feelings as a motivational force to improve one's performance (van de Ven, Zeelenberg, &

Pieters, 2009). Alternatively, envious individuals might seek to reduce closeness with

advantaged others (if the domain is highly self-relevant) to reduce the intensity of envy, or

conversely by increasing closeness with advantaged others when the domain is low on personal

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[2] Krizan and Johar (2012; Study 2) found that vulnerable narcissism was positively correlated with 4 of 5
components of envy: inferiority feelings, depressive feelings, subjective feelings of injustice, hostile feelings, but the
positive correlation with ill will narrowly missed statistical significance.

self-relevance. Finally, envy may be placated by reducing the relevance of the comparison

domain, perhaps telling oneself that the domain is not as important as one previously thought, or

by expanding one's self-concept to include other comparison domains to lessen the impact of the

envy-inducing comparison. Notably, not all of these strategies are adaptive responses to envy. In

particular, reducing closeness with envied others may lead to social isolation while reducing the

importance of a comparison domain may prevent future improvement and constitute a self-

deceptive response - a case of sour grapes. In sum, the model suggests that individuals may

reduce envy feelings via behavioural (increased effort) or cognitive (reframing the nature and/or

consequences of an upward social comparison) means.

Similarly, other authors have suggested cognitive strategies that may reduce the intensity

of envy feelings. For instance, envious individuals may benefit from learning to accept their

limitations and reframing upward social comparisons away from zero-sum games where a

disadvantageous social comparison can only be remedied at the comparison other's expense

(Exline & Zell, 2008). Re-assessing one's desires, beliefs, and goals within a broader context

may also reduce the importance of attaining a desired object or attribute (Harris & Salovey,

2008).

Other suggested strategies have focused on emotional reactions to threatening upward

comparisons. As Klein (1957/1975) notes, envy is incompatible with gratitude. Developing a

sense of gratitude and related incompatible emotions, such as love, humility, and self-

compassion, may quell feelings of envy (Exline & Zell, 2008; Harris & Salovey, 2008).

Envy has been noted as a significant problem in the workplace due to its links to lower

group performance, group cohesion, and higher absenteeism (Duffy & Shaw, 2000), poor-quality

working relationships between employees and management (Vecchio, 2005), and higher rates of

counterproductive work behaviours (e.g., Cohen-Charash & Mueller, 2007). As such, authors in this field have provided some suggestions to organizational leadership to prevent and respond to envy-related problems in the workplace. Dogan and Vecchio (2001) recommend shifting corporate culture to foster open communication, team culture, and provide incentives for cooperation and group performance. Bedeian (1995) suggests that employees anticipate coworkers' envy as one advances in an employment setting and minimize the possibility of harm by avoiding bragging, revealing little information about oneself, utilizing counselling to manage feelings of envy, and exiting "sick systems" - workplaces where adversarial relationships and mistrust prevail. However, these suggestions have not been examined in the context of an empirical research study to demonstrate their utility.

Despite these suggestions, no known studies to date have directly sought to evaluate the efficacy of an intervention to reduce feelings of envy. However, one study by Salovey and Rodin (1988) that investigated the strategies that lay individuals use to manage envy feelings may prove insightful. Their sample of students completed a questionnaire assessing how likely they were to use each of 15 coping strategies to manage feelings of jealousy (although the example situations often focused on envy) across domains of school/work and friendships. These domains were chosen because of the high frequency of relevant social comparisons in these domains, so participants would be likely to respond based on actual (vs. hypothetical future) experiences. These strategies were compared to ratings of jealousy/envy across 10 situations in each domain, as well as rate the intensity of tension-anxiety, depression, and anger in each domain.

A factor-analysis of the relevant coping statements identified three commonly used strategies: self-reliance, self-bolstering, and selective ignoring. The first of these, self-reliance, was related to emotional control (e.g., refraining from feeling angry, sad, or embarrassed),

avoiding social comparisons, and increasing effort to achieve a desired goal. Self-bolstering involved drawing attention to one's positive qualities and doing nice things for oneself. Selective ignoring involved downplaying the importance of the social comparison. These three strategies were evaluated in comparison to relevant emotional outcomes that included feelings of depression, anger, and tension-anxiety. Self-reliance was most strongly related to the lowest levels of jealousy/envy across comparison domains while ignoring produced a slight reduction in jealousy/envy. Self-bolstering did not predict lower jealousy/envy across comparison domains; however, it was associated with lower depressive feelings in general. The self-bolstering strategy also uniquely benefitted individuals who were already experiencing envy/jealousy, as they reported lower depressive feelings (both comparison domains) and anger (school/work domain only).

Self-reliance may be a particularly adaptive strategy to prevent and manage envy feelings, and is consistent with other suggestions in the literature (e.g., Exline & Zell, 2008; Harris & Salovey, 2008). However, this strategy is likely untenable for envy-prone individuals because of the intensity of their experienced inferiority feelings and emotional reactivity that may interfere with the implementation of cognitive-based envy management strategies (Smith et al., 1999). As such, self-bolstering presents an intriguing strategy for envy-prone individuals as a way to manage feelings of inferiority and hostility that are so troubling for self and others. The authors comment that while self-bolstering may be unsuited as a general coping strategy for an initial jealousy/envy-provoking situation, it may be extremely beneficial for individuals who are prone to jealous/envious reactions, reducing key components of envy (inferiority, anger). Nearly a decade later, Smith and Kim (2007) concluded that "the existing guidelines for helping people

with their envy-based problems seem rudimentary" (p. 60) and suggested that Salovey and

Rodin's (1988) self-bolstering strategy may be a promising means of reducing envy reactions.

Self-Affirmation

Self-affirmation (Steele, 1988) has emerged as a promising approach to help individuals

cope with threatening information, events, and comparisons and would appear to share some

conceptual overlap with the self-bolstering approach noted by Salovey and Rodin (1988). In

outlining his theory, Steele (1988) proposed that individuals possess a self-system that explains

oneself and the surrounding world to oneself, in order to maintain an experience of the self as

adaptively and morally adequate. He suggests that individuals may indirectly respond to self-

integrity threats by affirming alternative resources or aspects of the self - an approach commonly

referred to as self-affirmation (Steele, 1988). Self-affirmation is viewed as a means of restoring

general self-integrity when coping with the implications of a threat to one's self-regard. As Harris

and Epton (2009) note, self-affirmation interventions are "designed to (i) make a central and

positive aspect of the self-concept salient, (ii) provide a reminder of 'who you are,' and (iii) offer

reassurance that self-worth can be derived from other aspects of the self than the threatened one"

(p. 964).

Self-affirmation's contention that an individual need not directly affirm the threatened

aspect of the self or resolve the threat in order to restore self-integrity, but can do so through

indirect means, has likely contributed to its applicability to a wide variety of threats to the self.

Indeed, self-affirmation has developed an extensive research base, particularly over the past

decade. Early research observed that self-affirmation interventions reduced participants' attitude

shift after writing a counter-attitudinal essay, suggesting that participants who affirmed a core

(but unrelated) aspect of themselves were able to acknowledge their self-contradiction rather than deny it or attempt to fit it into a self-enhancing view of the self (e.g., Steele & Liu, 1983).

Subsequent research has identified that self-affirmation interventions may reduce biased processing and promote an even-handed evaluation of potentially threatening information on divisive social issues (e.g., capital punishment, abortion; Cohen, Aronson, & Steele, 2000; Cohen et al., 2007). Self-affirmation has also been shown to reduce in-group bias (Sherman & Kim, 2005; Sherman, Kinias, Major, Kim, & Prenovost, 2007) and reduce athletes' self-handicapping tendencies (Finez & Sherman, 2012). This approach has also been successfully utilized in the promotion of health and prevention of illness, focusing on topics ranging from alcohol consumption and breast cancer risk (Klein, Harris, Ferrer, & Zajac, 2011; Harris & Napper, 2005), caffeine consumption (Sherman, Nelson, & Steele, 2000), smoking cessation (Armitage, Harris, Hepton, & Napper, 2008; Harris, Mayle, Mabbott, & Napper, 2007), HIV risk (Sherman et al., 2000), reducing stigma associated with therapy seeking (Lannin, Guyll, Vogel, & Madon, 2013), and increasing consumption of fruits and vegetables (Epton & Harris, 2008; Harris et al., 2014). Self-affirmation interventions have also been used in academic settings to reduce stereotype threat (Rydell, Shiffrin, Boucher, Van Loo, & Rydell, 2010) and reduce the achievement gap for Latino (Sherman et al., 2013) and African-American (Cohen, Garcia, Apfel, & Master, 2006; Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009) students relative to European American students in the United States.

McQueen and Klein's (2006) review of self-affirmation identified three predominant variants in how this intervention is delivered: utilizing a value scale, value essay, or a writing task. The value scale typically involves providing participants with a list of personal values. Depending on the experimental condition, participants may be asked to complete a value scale

for their highest-rated (affirmation) or lowest-rated (control) value; simply completing a scale

related to an important value is thought to be affirming (e.g., Sherman et al., 2000). Value essays

usually ask participants to rate in order of importance a list of personal values or characteristics

then write a short essay on their top-rated value (specific instructions vary, and may involve

reflection on a time when the value was particularly important, a time when it made them feel

good about themselves, how they have used it in their everyday lives, etc.). Writing tasks

typically involve identifying and writing about some positive characteristic or experience.

       The application of self-affirmation theory to such a diverse set of social, clinical, and

academic problems is even more surprising when considering the simplicity of most

interventions. Many of these self-affirmation variants can be completed in 15 minutes or less

while the benefits from completing a single exercise are often evident one week later (e.g., Epton

& Harris, 2008; Thomaes, Bushman, Orobio de Castro, Cohen, & Denissen, 2009), with some

studies demonstrating considerably longer effects (e.g, 3 months; Harris et al., 2014). Studies

examining self-affirmation in the context of academics have often utilized repeated

administrations (2-5 times) of the same self-affirmation manipulation, documenting effects

extending the length of an academic semester (Miyake, Kost-Smith, Finkelstein, Polluck, Cohen,

& Ito, 2010) and even up to 2-year follow-up (Cohen et al., 2009).

       Recursive effects.

       One perspective on self-affirmation interventions is that, by providing a salient reminder

of 'who you are,' individuals are able to cope with an immediate self-threat without engaging in

ego protection (Sherman & Cohen, 2006; Harris & Epton, 2009). From this perspective, self-

affirmation may temporarily restore self-integrity and buffer the self against potential threats

(Steele, 1988). Recent studies have also documented more enduring benefits of self-affirmation

interventions lasting months or even years, suggesting that there may be other mechanisms at work (e.g., Cohen et al., 2009; Sherman et al., 2013). Cohen and Sherman (2014) theorize that self-affirmation may produce such durable change by creating a "cycle of adaptive potential" (p. 335) - a recursive process whereby a timely intervention may set in motion a series of reciprocally reinforcing interactions between the self-system and the larger social system. These authors suggest that self-affirmation entails reflection on a lifelong source of strength and broadens their conception of themselves to encompass other individuals and purposes, reducing the impact of a particular threat one is faced with.

Cohen and Sherman (2014) note that self-affirmation has demonstrated a lasting impact, or potential thereof, in domains of education, health, and relationships. Of these three, research on the long-term impact of self-affirmation on relationship factors appears least developed, though likely most relevant to the problem of envy. Self-affirmations may encourage individuals to engage in more prosocial behaviours that strengthen relationships while attenuating tendencies to engage in relationship-harming behaviours, each in turn prompting reciprocal relations from others (Cohen & Sherman, 2014). As strained interpersonal relationships tend to follow chronic envy experiences (Smith & Kim, 2007), affirmation interventions may plausibly help reverse this negative cycle. When individuals are later faced with an important self-threat, they may be buffered by the positive experiences that have accrued since the initial affirmation that insulate the self from threat.

Limits to self-affirmation.

Self-affirmation manipulations have demonstrated compelling evidence for their effectiveness across a breadth of domains, although some limitations have emerged within the research literature. This is evident in the inconsistent link between self-affirmation and

behavioural change, particularly in the domain of health. While self-affirmation is typically

linked to self-reported intentions to change one's behaviours (reducing risk behaviour, increasing

health-promoting behaviour), some studies have reported no changes in behaviours as a result of

self-affirmation (e.g., Harris & Napper, 2005; Reed & Aspinwall, 1998). Self-affirmation may

paradoxically be most effective when individuals are unaware of their impact and less

efficacious if participants are made aware of affirmation effects (Sherman, Cohen, et al., 2009).

However, individuals may benefit from self-affirmations even when aware of its effects provided

they choose to engage in this process (Silverman, Logel, & Cohen, 2013).

Additionally, there appear to be certain circumstances when self-affirmation interventions

may backfire. Sherman and Cohen (2006) write that directly affirming a threatened self-domain

may produce greater defensiveness by increasing participants' confidence, certainty, impunity,

and resistance to change. Self-affirmations that affirm participants' moral qualities or self-

objectivity may also lead to undesirable outcomes, such as increased prejudicial and

discriminatory attitudes and behaviours (Sherman & Cohen, 2006). McQueen and Klein (2006)

also note that self-affirmation interventions may be less effective when they involve dissonance-

arousing behaviours for which one has already developed defensive strategies, such as smoking

or alcohol use.

Rationale for applying self-affirmation interventions to envy.

If self-affirmation is an effective intervention in reducing envy, we might expect to

observe a reduction in envy's prime components - inferiority, hostility, and resentment, as well as

an attenuation of its behavioural (e.g., aggression) and cognitive (e.g., other-derogation,

schadenfreude) consequences and lowered defensiveness. Indeed, there are varying degrees of

support for these propositions within the self-affirmation research literature.

With respect to defensiveness, self-affirmation seems to allow individuals to even-handedly evaluate evidence for positions that contradict their own (e.g., Cohen, Aronson, & Steele, 2000) and facilitates greater openness to alternative viewpoints (Binning, Sherman, Cohen, & Heitland, 2010). A review article by Harris & Epton (2009) analyzes self-affirmation's various impacts on defensive responding to health risk information. They conclude that self-affirmed participants tend to be more accepting of threatening health messages, believe the threat exists, acknowledge personal message acceptance - the idea that a threat applies to them personally and will likely produce negative health consequences if left unchanged, and are less likely to derogate the validity of the health-risk message. Applied to envy, affirmed individuals might be expected to be more willing to acknowledge their inferior position and less likely to derogate the validity of the basis for their disadvantage (e.g., claim that a test is invalid after receiving failure feedback) relative to unaffirmed individuals.

Affirmed participants appear to be better able to cope in difficult or threatening situations, which may include those involving envy-inducing upward comparisons. Individuals may decrease closeness with others in order to maintain a positive self-evaluation when faced by relationship or social comparison threats (Tesser, 1988; Jaremka, Bunyan, Collins, & Sherman, 2011) - a tendency that is characteristic of narcissism (Nicholls & Stukas, 2011). However, self-affirmation has been shown to reduce this defensive distancing from others (Jaremka et al., 2011) and attenuate the need to seek compensatory downward social comparisons following failure (Wood, Giordano-Beech, & Ducharme, 1999). Moreover, self-affirmation interventions have been linked with increases in feelings of love, connectedness, and prosocial feelings towards others for up to a three-month period (Thomaes, Bushman, Orobio de Castro, & Reijntjes, 2012). When individuals fail, self-affirmation may prevent them from ruminating on their inferior

performance while still maintaining the importance of this goal for the self (Koole, Smeets, van Knippenberg, & Dijsterhuis, 1999). Insofar as self-affirmation prevents dwelling on one's failures, this may reduce the intensity of inferiority feelings and envy towards advantaged others (Smith & Kim, 2007).

Self-affirmation may generally lessen the physiological impact of threatening situations. In laboratory (Creswell, Welch, Taylor, Sherman, Gruenewald, & Mann, 2005) and naturalistic settings (Sherman, Bunyan, Creswell, & Jaremka, 2009), self-affirmation interventions attenuated stress-related increases in neuroendocrine and sympathetic nervous system activation, with the latter study's effects lasting for two weeks. Self-affirmation may also counteract ego depletion and allow individuals to regain self-control after expending self-regulatory resources (Schmeichel & Vohs, 2009). These finding might suggest that envious individuals may benefit, in part, by being able to improve their performance relative to others by persisting longer at difficult tasks and with a reduced stress response, delaying gratification, and making better decisions such as withholding efforts to sabotage advantaged others.

Self-affirmation interventions have also been linked to tendencies to pay closer attention to one's errors and shortcomings and subsequently learning from these mistakes to improve performance (Legault, Al-Khindi, & Inzlicht, 2012). Insofar as these characteristics resemble benign envy (van de Ven et al., 2009; van de Ven et al., 2011) over its malicious counterpart, this may suggest that self-affirmation reduces feelings of hostility and inferiority in order to permit (benign) envy to be a motivational force. Spencer, Fein, and Lomore (2001, Study 3) showed that affirmed participants were significantly more likely to prefer to make an upward comparison than a downward comparison, whereas this tendency was reversed in non-affirmed participants who appeared to choose downward comparisons to bolster their self-image.

As noted earlier, envy and narcissism may encompass a variety of negative behaviours towards advantaged others ranging from non-cooperation (Parks, Rumble, & Posey, 2002) and other-derogation (Kernis & Sun, 1994) to malicious actions intended to harm others even at one's own expense (Klein, 1957/1975; Zizzo & Oswald, 2001). In contrast, self-affirmation has been shown to increase prosocial behaviours among adolescents for up to three months, with the most antisocial adolescents deriving the most benefit (Thomaes et al., 2012). A single self-affirmation writing intervention has also been shown to curb aggressive behaviours among adolescents for a period of up to one week (Thomaes et al., 2009).

Schadenfreude is a prototypical response to envy when an opportunity to delight in an advantaged rival's failure is presented (Smith et al., 2009) and appears to be characteristic of vulnerable narcissism (Krizan & Johar, 2012; Neufeld & Johnson, 2014). Indeed, schadenfreude is one means of boosting self-esteem and appears to be more common for individuals who possess low (versus high) levels of self-esteem (van Dijk, Ouwerkerk, Wesseling, & van Koningsbruggen, 2011; van Dijk, Ouwerkerk, van Koningsbruggen, & Wesseling, 2012). One study has examined self-affirmation interventions in connection with schadenfreude (van Dijk, van Koningsbruggen, Ouwerkerk, & Wesseling, 2011) and observed that affirming prior to exposure to an upward social comparison to a high-performing student attenuated feelings of schadenfreude when participants were told the student later experienced a major academic setback. As the threat manipulation (hypothetical high-performing student) closely mirrors manipulations used in studies linking envy and schadenfreude (e.g., Smith et al., 1996) and creates the ideal conditions for envy, these results suggest that self-affirmation may bolster self-views so that potentially envy-driven responses (e.g., schadenfreude, aggression) may be less pronounced or even absent because a positive self-view has been previously affirmed.

Overview of the Present Study

The present study tested the efficacy of a brief self-affirmation intervention in reducing manifestations of envy. To my knowledge, self-affirmation has not yet been applied to the problem of envy, nor has an envy-reducing intervention been systematically tested in a controlled experimental design. In order to create a context likely to induce envy reactions (Tesser and Collins, 1988), student participants were led to believe that a similar other (a same-sex undergraduate student) had outperformed them on a high-relevance domain (intelligence) and, as a direct result, participants would be monetarily disadvantaged across a competitive game relative to this opponent. Envy was broadly assessed using primarily self-reported dispositional and episodic envy symptoms and behavioural manifestations of aggression thought to reflect envy feelings (Parks et al., 2002). Potential long-term recursive self-affirmation effects (cf. Cohen & Sherman, 2014) were examined via a one-month follow-up study assessing whether affirmed participants experienced less envy and were better able to utilize recommended envy-reducing strategies relative to controls. Prospective mediators (level of construal, mood) and moderators (self-esteem, vulnerable and grandiose narcissism, self-compassion, dispositional envy , entitlement, and sex) were examined to determine how self-affirmation might reduce envy, and for whom the intervention may be most effective.

Mediators of Self-Affirmation

Explaining why self-affirmation attenuates envy reactions, if indeed the results support this conclusion, is an important question in gaining a more comprehensive understanding of this intervention and its underlying mechanisms. The search for mediators of self-affirmation effects has proven difficult and produced contradictory findings. The strongest candidate appears to be participants' level of construal, introduced below, which was hypothesized to mediate self-

affirmation effects. Mood was also examined as a plausible, though less likely alternative, given its weaker evidence base.

Level of self-construal. The extent to which individuals focus on a narrow, concrete level of processing vs. a larger, more abstract level - commonly referred to as an individual's level of construal (Wakslak & Trope, 2009) - has recently been proposed as a mediator of self-affirmation effects. Cohen and Sherman (2014) note that individuals typically narrow their attention when under conditions of threat, focusing on an immediate threat and its details; however, when affirmed, individuals may be more likely to view this threat as part of a larger picture, reducing the consequences of a particular threat for the self. This broader perspective may allow individuals to successfully uncouple themselves from the threat and boost their self-resources, attenuating the impact of the threat (Sherman & Hartson, 2011). As Sherman and Cohen (2006) summarize, "When self-affirmed, individuals feel as though the task of proving their worth, both to themselves and to others, is 'settled.' As a consequence, they can focus on other salient demands in the situation beyond ego protection" (p. 189).

Indeed, this mediator has received some support in the research literature. One study showed that affirmed Latino students not only improved academically relative to non-affirmed counterparts, but also viewed daily adversities from a broader perspective so that these did not contribute to identity threat or affect feelings of academic fit as non-affirmed Latino students experienced (Sherman et al., 2013). Elsewhere, broadened self-construals have been associated with more effective, proficient, and purposeful (vs. impulsive) behaviors, as well as greater persistence in working toward important goals (Vallacher & Wegner, 1989).

Applied to the present context, a broadened self-construal may help envious individuals to see beyond the current threat - an upward social comparison on a self-relevant domain -

thereby lessening the emotional impact of this particular comparison on the discrete but interrelated aspects of envy (inferiority, hostility, and resentment feelings). As such, they may be in a better position to make rational decisions that benefit the self, a prospect that envious individuals struggle to accomplish when exposed to advantaged others (e.g., Parks et al., 2002).

Mood. Another plausible mediator suggested in the literature is mood. Tesser (2001) noted that affect may be the "common currency" among self-regulatory mechanisms (p. 68), which may extend to self-affirmation. One study (Koole et al., 1999) observed that an implicit measure of positive mood mediated the relationship between self-affirmation and reduced rumination following failure feedback. However, the majority of studies - all using explicit mood measures - suggest that self-affirmation does not influence mood ratings (e.g., Fein & Spencer, 1997; Sherman et al., 2000; Schmeichel & Martens, 2005; Cohen et al., 2007). Assessing mood as a potential mediator may also serve an additional purpose by ruling out changes in mood as an explanation for self-affirmation effects. As noted by Sherman and Cohen (2006), self-affirmation effects extend well beyond what can be explained by simple mood effects (e.g., sensitivity to the strength of argument in favour of or against one's beliefs) and suggest a different mechanism of action (i.e., central vs. peripheral route persuasion). The inclusion of a second prospective mediator is also in line with the exploratory nature of this research study, given that no study has investigated self-affirmation's effectiveness in reducing envy nor examined potential mechanisms of action by which this effect may operate.

Moderators of Self-Affirmation

Searching for moderators of self-affirmation may be a more promising endeavour than searching for mediators in light of the fact that several potential candidates have received some degree of empirical support. These prospective moderators include self-esteem, grandiose

narcissism and self-compassion, although none of these moderators have been examined in the

context of envy. Vulnerable narcissism and dispositional envy were anticipated to emerge as

significant moderators, due in large part to their strong linkages to envy feelings in prior

research. Given the exploratory nature of this research topic, entitlement and sex were also

assessed as potential moderators. All prospective moderators are briefly discussed below.

Self-esteem. Dispositional self-esteem has been assessed as a potential moderator of self-

affirmation effects across a handful of studies (McQueen & Klein, 2006), although results have

been mixed as to whether individuals with high or low self-esteem are most likely to benefit

from the intervention. As Cohen and colleagues (2000) note, self-affirmation might plausibly

help the former group as they may be more likely to be convinced by personal affirmations and

remember these, whereas the latter group would have fewer psychological resources at their

disposal to cope with self-integrity threat and would be bolstered by the intervention. While

Creswell and colleagues (2005) observed that self-affirmation buffered participants with high

(but not low) self-esteem against physiological stress response, Jaremka and colleagues (2011)

observed that self-affirmation attenuated a variety of destructive behaviours and behavioural

intentions toward romantic partners when experiencing relationship threat, but only among low

self-esteem individuals. These behaviours included withdrawing one's investment in their

partner's wellbeing, derogating one's partner, and endorsing intentions to engage in destructive

behaviours (e.g., "I will do something that causes an argument"). The interpersonal nature of the

threat manipulation in this study and array of defensive behaviours attenuated by the intervention

suggest a close link to the present study's focus on envy and aggressive behaviour. Offering

further support, recent research by Düring and Jessop (2015) reported that low self-esteem

individuals were more open to personally threatening health risk information and form intentions

to increase their physical exercise when affirmed; no such benefits were observed among high self-esteem participants.

Self-affirmation's potential benefit among individuals with low self-esteem is consistent with an emerging body of research suggesting that this intervention generally benefits individuals who are most psychologically vulnerable to a given threat. For example, this pattern includes individuals with higher levels of antisocial behaviour (Thomaes et al., 2012), who are most concerned about negative college evaluation (Sherman, Bunyan, et al., 2009), or are most at risk for negative health consequences (e.g., Harris & Napper, 2005). As Jaremka and colleagues (2011) note, "a growing literature suggests that individual differences that index vulnerability to specific threats are crucial to understanding self-affirmation processes" (p. 267). As applied to the current study, individuals with low self-esteem were anticipated to derive particular benefit from a self-affirmation intervention.

Narcissism. Narcissism has been introduced previously in this paper as a personality trait long thought to be associated with envy-proneness. More precisely, research has indicated that narcissistic vulnerability is closely linked to dispositional and episodic envy (Krizan & Johar, 2012; Neufeld & Johnson, 2014) whereas narcissistic grandiosity generally is not, although this expression is characterized by extreme reactivity to ego threats (e.g., Bushman & Baumeister, 1998).

Upward social comparisons may be perceived highly threatening, particularly for narcissistic or envy-prone individuals (Bogart, Benotsch, & Pavlovic, 2004; Smith et al., 1999; Smith, Parrott, Ozer, & Moniz, 1994). Sherman and Cohen (2006) observe three general categories of responses that individuals can pursue when faced with threats to the self. The first two involve responding directly to a threat by accepting its consequences for the self, or by

responding defensively by devaluing the threat in some way. As Sherman and Cohen (2006) note, the first option (direct response) is unappealing as it threatens positive self-regard, and the second (defensive response) may minimize the threat at the expense of learning from important, though threatening, information.

Individuals with predominantly vulnerable narcissistic traits may likely utilize the former response to threat, as suggested by their endorsement of envious tendencies and situational expressions of envy (Krizan & Johar, 2012; Neufeld & Johnson, 2014) and their self-esteem, which is highly variable from day-to-day (Zeigler-Hill & Besser, 2013) and contingent on their performance across a variety of domains (Zeigler-Hill, Clark, & Pickard, 2008). In contrast, individuals with predominantly grandiose narcissistic traits are characterized by defensive responding, evident in their hypervigilance for ego threats (Horvath & Morf, 2009), utilization of self-serving and self-enhancing biases (Ronningstam, 2009), and aggressive responding to those who insult or humiliate them via social comparison (Bushman & Baumeister, 1998; Thomaes, Bushman, Stegge, & Olthof, 2008; Bushman, Baumeister, Thomaes, Ryu, Begeer, & West, 2009; Thomaes, Stegge, Olthof, Bushman, & Nezlek, 2011).

Self-affirmation presents a third option for responding to ego threats (Sherman & Cohen, 2006), one that may be particularly helpful and attractive for narcissistic and envious individuals. Rather than sacrifice positive self-views or selectively processing threats in order to preserve self-integrity, self-affirmation may bolster self-image while minimizing defensive responding. Indeed, Thomaes and colleagues (2012) reported that a single self-affirmation intervention aroused significantly more frequent prosocial behaviours and feelings among aggressive adolescents for a one-week period.

Only one study assessed the effectiveness of self-affirmation among narcissistic individuals. Thomaes and colleagues (2009) observed that narcissistic adolescents[3] were highly aggressive toward their peers when experiencing ego threat (operationalized as low state self-esteem); however, a single, brief self-affirmation writing task curbed aggressive behaviours for a period of one week regardless of state self-esteem. While narcissism was not conceptualized as a moderator, its interaction with ego threat indicates that self-affirmation only reduced aggressiveness among individuals with high (1 SD above mean) vs. low (1 SD below mean) dispositional levels of narcissism. Elsewhere, grandiose narcissism has been shown to moderate affective reactions to threatening upward social comparisons, promoting higher levels of hostility relative to less narcissistic individuals (Bogart et al., 2004).

Self-compassion. Self-compassion entails a pattern of empathic self-understanding and self-directed kindness when faced with pain or personal failure (Neff, 2003). Individuals possessing low levels of this trait may tend toward harsh self-criticism and feelings of isolation following failure, suggesting that they may lack an adaptive dispositional resource with which to cope with situations that may give rise to envy feelings. Lindsay and Creswell (2014) report that self-compassion moderated the effect of self-affirmation on self-compassionate feelings after watching a mildly embarrassing videotape. Specifically, self-affirmation increased self-compassionate feelings for individuals who had low levels of dispositional self-compassion, relative to controls.

Dispositional envy. Dispositional envy has not been examined in the context of self-affirmation. However, to the extent that self-affirmation interventions preferentially benefit

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[3] Narcissism was assessed using the Childhood Narcissism Scale (Thomaes et al., 2008), a unidimensional scale that assesses narcissistic grandiosity.

individuals at greatest psychological threat, the intervention is expected to bolster individuals who possess a predisposition to experience frequent and intense envy feelings.

      Entitlement. Harbouring entitled attitudes and expectancies appears to be an important risk factor for stronger experiences of envy when expected favourable outcomes fail to materialize (Krizan & Johar, 2012; Neufeld & Johnson, 2016). Along the same line as other prospective moderators noted earlier, self-affirmation may help to attenuate envy reactions among individuals whose heightened sense of deservingness and entitlement renders them susceptible to feelings of envy.

      Sex. Sex was also assessed as a potential moderator in light of evidence supporting sex differences with regard to how intensely men and women experience envy across contexts (DelPriore, Hill, & Buss, 2012). However, all self-affirmation effects were anticipated to be gender-invariant, based in part on the lack of reported sex differences in the self-affirmation literature and no compelling theoretical rationale.

Multimodal Measurement of Envy and Related Phenomena

      A broad, multimodal measurement approach to assessing envy was pursued in light of envy's socially undesirable nature, both in general (Smith et al., 1999) and for narcissistic individuals in particular (Hotchkiss, 2005; Kernberg, 2007). Consequently, self-reported envious tendencies (i.e., dispositional envy) were supplemented with a measure of actual envy feelings in a particular situation (i.e., episodic envy). Behavioural aggression - a probable manifestation of envy feelings that may be less sensitive to social desirability bias - was assessed using an established experimental paradigm (Parks et al., 2002). Finally, supplementary author-created items were created to indirectly assess potential envy processes and defensiveness to threatening feedback.

Parks and colleagues (2002) utilized a behavioural measure of aggression (non-cooperation) that may serve as a useful proxy for envy, observing that higher dispositional envy scores predicted lower rates of cooperation with an advantaged (and presumably envied) opponent. Their paradigm used a Prisoner's Dilemma scenario to study the effects of envy on reciprocation originally developed by Axelrod (1984). Participants competed against a computer opponent in a 20-round scenario in which they had the opportunity to cooperate with or defect against an opponent. Both players received points depending on the combination of both players' choices. Long-term cooperation is the rational choice and yields the highest payouts over the course of the game, but should be particularly unattractive to someone experiencing envy as it allows one's opponent to earn substantially more than oneself. Unbeknownst to participants, however, their opponent was a pre-programmed strategy that mimicked the participant's decision from the prior round, ensuring that cooperation is rewarded with cooperation in the following round, and conversely a defection is punished with a subsequent defection. In short, the extent to which participants choose to not cooperate with their opponent was consequently operationalized as a potential behavioural proxy for envy feelings.

Parks and colleagues' (2002) study utilized a 2 x 2 research design to investigate whether providing a justification for participants' disadvantage (vs. no justification) and/or a compensatory benefit to make up for ("ameliorate") the initial disadvantage (vs. no amelioration) influenced the rate of cooperative behaviour. Participants' disadvantage was justified if participants had been ostensibly outperformed on an eight item "interpersonal situations" test or unjustified if based on the position of the participants' name in the alphabet. In the amelioration condition, participants were given an extra ticket in a prize drawing at the conclusion of the study, whereas no additional ticket was provided in the no-amelioration condition.

Of the four possible permutations, a research design corresponding to the justification-no amelioration condition appears best suited to producing feelings of envy. Having some justification for participants' disadvantageous position is important for envy induction. Smith and Kim (2007) note that objectively unfair disadvantages tend to engender feelings of righteous indignation rather than envy because inferiority feelings are not present. Applied to the present study, an unambiguously unfair disadvantage may foster anger and ill will toward the experimenter for a capricious decision rather than envy toward an advantaged rival. The basis for this justification in the present study was a stressful an ostensibly valid intelligence test in place of the interpersonal perceptions quiz. This modification reflects the fact that intelligence tends to be an important value for most students, as suggested by its superior ranking relative to many other personal values (Johnson, 1991; Johnson & Neufeld, 2014) and is positively correlated with academic success (Richardson, Abraham, & Bond, 2012). Assigning participants to receive disadvantageous payouts on the basis of an inferior intelligence test score was anticipated to amplify the magnitude of the social comparison threat and heighten experiences of envy toward a smarter and monetarily advantaged opponent. In addition, providing no amelioration for inferior outcomes appears preferable as it is consistent with most real-world conditions where inferior outcomes that may foster envy (e.g., losing a race; a poor exam score) are rarely balanced out afterwards.

A simple ultimatum game (Güth, Schmittberger, & Schwarze, 1982) was also incorporated as a potential supplementary behavioural indicator of envy feelings. Ultimatum games involve two players: a proposer, who determines how to divide some resource (typically monetary) between the two players, and a responder who may choose to accept or reject the offer. If accepted, both players receive the agreed resource shares; if rejected, neither player

receives anything. In the present study, all participants were assigned to the responder role and ostensibly offered a mere $2 share from a $10 prize by their opponent, whom they were led to believe would receive $8. Choosing to reject this unfair offer, much like non-cooperation in the modified Prisoner's Dilemma game (Parks et al., 2002), is ultimately self-defeating and may potentially serve as a litmus test for envy-motivated behaviour. Affirmed participants were anticipated to be more likely to make a rational decision and accept the uneven split relative to control participants.

An 8:2 ratio was selected in order to balance acceptance and rejection decisions across the sample and avoiding a skewed distribution. Few studies have examined decision-making involving extremely unfair offers. A recent study (Casal, Güth, Jia, & Ploner, 2012) predicted that acceptance rates drop considerably when thresholds exceed a 2:1 ratio of earnings for the proposer vs. the responder. Using a €30 payout, responders increasingly rejected unfair offers to a maximum of 28.1% of the time when offered only €6 (to the proposer's €24). Knight (2012) adds that offers under 20% tend to be rejected 50% of the time in previous research. In his study, he observed that a ₤8 payout divided in a ₤6/₤2 split for the proposer and responder was accepted approximately 40% of the time, whereas acceptance fell to around 20% for a ₤7/₤1 split. Knight (2012) also observed that participants faced with the ₤6/₤2 offer took longer than other conditions, which he interpreted as participants feeling conflicted as to whether or not to accept the offer and suggested may be most likely to reveal individual differences among responders. Based on these findings, achieving a balanced (~50%) acceptance rate that provides the highest number of observations in either category would be most likely when the ultimatum ratio is between 3:1 and 4:1. Participants' rates of acceptance and rejection were evaluated in the pilot testing phase preceding the full study.

Defensiveness is a common response to self-integrity threats, one that can restore self-integrity but does so at the expense of future learning experiences (Sherman & Cohen, 2006). In a later paper, Cohen and Sherman (2014) liken defensive processes to a "distracting alarm... consum(ing) mental resources that could otherwise be marshaled for better performance and problem solving... (and) rais(ing) a barrier to adaptive change" (p. 335). These authors note that the self-integrity motive is so pronounced that individuals may display defensive reactions even when the threat is relatively mundane (Cohen & Sherman, 2014). While all individuals are prone to some degree of self-defensive coping with threats to self-integrity, this strategy is highly characteristic of narcissism (Horvath & Morf, 2009). For instance, grandiose narcissism has been linked to self-serving biases when presented with failure or success feedback regarding one's intelligence (Stucke, 2003), and self-aggrandizing memory distortions portraying an overly positive history when faced with rejection (Rhodewalt & Eddings, 2003). Narcissists also may use others in the service of bolstering the self, utilizing both comparative self-enhancement and other-derogation strategies to bolster the self at the expense of others (Campbell, Reeder, Sedikides, & Elliot, 2000; Farwell & Wohlwend-Lloyd, 1998).

Self-affirmation interventions typically reduce defensiveness in response to a wide variety of threats (Steele, 1988; McQueen & Klein, 2006; Cohen & Sherman, 2014) and may plausibly extend to envy as well, broadening the assessment of self-affirmation's impact in this problem domain. In the present study, defensiveness was assessed via participants' self-reported trivializing reactions to threatening (bogus) feedback regarding their intellectual ability (i.e., derogating the validity of the intelligence test or importance of the results) and participants' ratings of liking for themselves and their intelligence as compared to their ratings for an ostensibly smarter opponent. Following a procedure I have used previously (Neufeld, 2013),

students' ratings for their opponent will be subtracted from their self-rating in either domain (i.e., self-rating minus other-rating). Positive ratings indicate that the self is viewed as more liked and/or intelligent than the opponent, whereas negative ratings indicate the reverse. Discrepant self-other liking ratings favouring the self may reflect defensive self-enhancement (and other-derogation) in order to bolster self-integrity. Regarding the ratings for intelligence, heavily discrepant patterns favouring one's opponent may reflect inferiority feelings captured by envy (Smith et al., 1999) whereas patterns favouring the self may suggest a defensive bias by not accepting potentially threatening information regarding one's performance (Sherman & Cohen, 2006). For ease of description and consistency throughout the paper, these self-other ratings are referred to as indirect envy as they may potentially mirror envy feelings. Both of these author-created items are considered exploratory and are intended to supplement self-reported and behavioural manifestations of envy.

Hypotheses

The present study investigated whether a single self-affirmation values essay intervention would reduce envy toward an ostensibly intellectually and monetarily advantaged rival relative to a control group. Specifically, affirmed participants were hypothesized to report feeling less envious toward their rival (Hypothesis 1) and demonstrate reduced behavioural manifestations of envy in the form of greater cooperation (Hypothesis 2A) and greater acceptance of an unfair ultimatum offer (Hypothesis 2B).

Self-affirmation was also hypothesized to exert a recursive effect on envy at a one-month follow-up. This effect was anticipated to reduce the intensity of self-reported envy reactions when recalling one's most intense past-month experience involving envy (Hypothesis 3A) and promote greater use of coping strategies in this situation (Hypothesis 3B). Self-affirmation was

also hypothesized to predict fewer past-month instances of envy (Hypothesis 3C) and envy-related hassles (Hypothesis 3D).

Self-affirmation effects on envy were hypothesized to be moderated by several dispositional traits (Hypothesis 4). Specifically, individuals who are at particular risk to experience intense envy in response to a threatening upward comparison - those with elevated dispositional envy, vulnerable narcissism, grandiose narcissism, and entitlement - were expected to derive greater benefit from the intervention. Similarly, individuals who have limited self-resources to draw upon when threatened (i.e., low self-esteem) or tend towards self-criticism and isolation in response to failure (i.e., low self-compassion) were expected to be most helped by self-affirmation. Participants' sex was also examined as a potential moderator with no specified hypothesis. All analyses controlled for participants' ratings of the importance of intelligence by including this variable as a covariate.

Finally, self-affirmation was hypothesized to operate by expanding one's perspective beyond an immediate threat to see the *big picture*. This shift toward abstract self-construal was hypothesized to mediate self-affirmation's effects on envy (Hypothesis 5). Mood effects were examined as a potential alternative explanation for affirmation-envy effects.

Method

Overview of Procedure

The present study was preceded by a data screening phase that identified eligible participants for recruitment to the study based on their dispositional envy scores in order to identify and over-sample envy-prone individuals. In order to conceal the nature of the experiment and its objectives, the study was described as generally assessing the relationships between personality, values, intelligence and decision-making during a competitive task (see

consent forms in Appendices B-D for the description given during each study phase). Eligible

participants received an email invitation containing a code that permitted them to sign up for

Parts 1 and 2 of the study. Part 1 consisted of an online survey containing scales assessing

potential dispositional moderators of self-affirmation effects (narcissism, self-esteem, self-

compassion, and entitlement), baseline self-construal, and demographics.

Part 2 occurred one week later and involved same-sex participant pairs attending an in-

person timeslot held in the research laboratory; students were seated in adjacent rooms and did

not meet. Participants completed either a self-affirmation or control essay followed by a bogus

intelligence test consisting of primarily unsolvable items, which was anticipated to constitute an

intense self-integrity threat. All participants were given failure feedback on this test which was

described as being predictive of future academic success. Participants were also led to believe

that their opposite-room opponent had markedly outperformed them, and consequently would

receive a significant advantage in an upcoming mutual decision game involving the potential for

monetary earnings. A modified 20-round mutual decision game (Parks et al., 2002) followed in

which participants could "cooperate" or "compete" with their opponent in each round. [4]

Unbeknownst to participants, both players received inferior outcomes and were not in direct

competition, but instead competed against a pre-set "tit-for-tat" strategy that copied players'

choices from each prior round. Each participant inevitably earned fewer points than their

advantaged opponent by the conclusion of the game. Next, all participants made a decision

regarding whether they would accept or reject an unfair ultimatum offer involving a $10 cash

prize proposed by their opponent. Participants then received an individualized funneled

debriefing that dehoaxed and corrected all deceptive elements while probing for suspiciousness

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[4] "Compete" was substituted for "defect" in the present study as it was thought to convey a clearer and less socially undesirable meaning to participants.

regarding various study design elements. Prior to dismissal, participants read a

psychoeducational handout that provided some information on envy and its consequences and

recommended four coping strategies, along with a brief rationale for each.

One month after Part 2, each participant received an emailed invitation to participate in a

follow-up online survey (Part 3). The survey asked participants to recall and describe their most

intense past-month experience of envy, rate their affective reactions to the episode, and indicate

the extent to which they used and found helpful each of the four strategies. Participants also

indicated the frequency with which they experienced, found unpleasant, and dwelled on a variety

of hassles commonly experienced by college students.

Participants

An a priori power analysis was conducted in order to determine an appropriate sample

size. Although no studies have assessed self-affirmation in the context of envy, McQueen and

Klein (2006) report effect size calculations across a range of dependent variables. While they

cautioned that a meta-analysis of the effect sizes was inappropriate due to the heterogeneity of

the outcome measures, their pattern of findings indicated that self-affirmation produced at least a

medium effect size ($d = 0.50$) in the majority of studies, with many well in excess of this figure.

G*Power (version 3.1.7; Faul, Erdfelder, Lang, & Buchner, 2007) determined that a sample size

of 64 participants per condition would be required to detect a medium-sized effect ($d = 0.50$) at α

$= 0.05$ with 80% power for a contrast between two independent means. With two experimental

conditions (self-affirmation vs. control) this necessitated a total minimum sample size of 128

participants. Twice the minimum sample size of participants were sought for each condition in

order to ensure an adequate participant sample after data screening (128 per condition; 256

participants in total). Participants were recruited from the University of Manitoba psychology

subpool with a focus on recruiting comparable numbers of women and men. Students received

partial course credit in exchange for their participation, as well as any monetary earnings

collected during the course of the study (described in the Procedures section). A pilot testing

phase preceded the study in order to assess the effectiveness of the manipulations and identify

any need for modifications to the study design.

Materials

      Mass testing measures (Appendix A).

      Dispositional envy. Participants completed the Dispositional Envy Scale (DES; Smith et

al., 1999), an 8-item unifactoral measure of chronic, intense envy experiences. Sample items

include, "No matter what I do, envy always plagues me" or "Frankly, the success of my

neighbours makes me resent them." The scale demonstrated very good internal consistency in the

present study ($\alpha = .88$).

      Importance of intelligence. This 3-item author-created scale based on research by

Sedikides & Skowronski (1993) assessed the centrality of intelligence to participants' identity

and self-worth. The core threat to participants' sense of adequacy in the present study entailed

false, negative feedback about one's intelligence - a domain that university students are likely to

perceive as highly important - and was expected to be experienced as a consequential threat to

students' self-integrity. Questions included: "How important is intelligence to your self-

concept?"; "How often do considerations of intelligence influence your behaviour?"; and, "How

badly would you feel if you were forced to conclude that, based on a review of the evidence, you

did not possess as much intelligence as you thought you did?" (reverse-scored). The scale

demonstrated marginally adequate internal consistency ($\alpha = .66$) and was deemed acceptable,

particularly given the small number of items and the tendency of Cohen's alpha to favour scales with more items.

Part 1: Dispositional measures (Appendix B).

Demographic questionnaire. Students provided their age, sex, year in university, first language, ethnicity, and email address (in order to link data across experimental phases and contact winners of the random cash drawing).

Narcissism. The Pathological Narcissism Inventory (PNI; Pincus et al., 2009) is a 52-item, 7-factor scale that assesses distinctly pathological aspects of both grandiose and vulnerable narcissistic expressions. Sample questions include, "I find it easy to manipulate people" and "It's hard for me to feel good about myself unless I know other people like me").

Subsequent research has supported the distinction between grandiose and vulnerable narcissistic phenotypes within the PNI (Wright, Lukowitsky, Pincus, & Conroy, 2010). Grandiose narcissism was assessed by three factors (Self-Sacrificing Self-Enhancement, Grandiose Fantasy, and Exploitativeness) spanning 18 items, while vulnerable narcissism was assessed by four factors (Contingent Self-Esteem, Devaluing, Hiding the Self, and Entitlement Rage) spanning 34 items. Internal consistencies for each factor were very good to excellent (Grandiose: $\alpha = .87$; Vulnerable: $\alpha = .94$)

Self-esteem. Students completed the 10-item unifactoral Rosenberg Self-esteem Scale (RSE; Rosenberg, 1965), the most commonly used measure of global self-esteem. The scale demonstrated very good reliability in the current study ($\alpha = .89$).

Entitlement. Entitlement is a core aspect of narcissism across both its vulnerable and grandiose expressions (Dickinson & Pincus, 2003) and has been linked to envy (Krizan & Johar, 2012). While not a focal construct in the present study, its inclusion may be valuable in

understanding the relationship between narcissism and envy. This trait was assessed using the 9-item unifactoral Psychological Entitlement Scale (Campbell, Bonacci, Shelton, Exline, & Bushman, 2004). The scale has been linked with self-serving beliefs and behaviours and demonstrated very good reliability in the present study ($\alpha = .89$).

Self-compassion. Dispositional self-compassion is a trait encompassing self-kindness (vs. self-judgment), recognition of one's common humanity (vs. isolation), and mindfulness (vs. over-identification; Neff, 2003). The Self-Compassion Scale is a 26-item measure that prior research has shown to be positively correlated with self-esteem, uncorrelated with narcissism, and negatively correlated with mental health outcomes such as depression and anxiety (Neff, 2003). While self-compassion has not been examined in the context of envy, one may reasonably expect that self-compassion would be related to lower levels of chronic envy as its patterns of associations with measures of personality and mental health outcomes are generally reversed. Additionally, fostering self-compassion has been suggested as a possible envy-reducing strategy (Exline & Zell, 2008). The scale demonstrated excellent internal consistency in the present study ($\alpha = .91$).

Level of self-construal. Participants completed a modified version of the Behavior Identification Form (BIF; Vallacher & Wegner, 1989). This dichotomous scale listed various behaviours (e.g., "greeting someone") and asked participants to choose whether they preferred to describe the behaviour in terms of a concrete, low-level identification ("saying hello") or an abstract, high-level identification ("showing friendliness"). Respondents' level of personal agency was calculated by summing the number of high-level action identifications. In order to permit repeated administrations of the BIF without using duplicate items, Sherman and colleagues (2013) expanded the scale to 60 items (divided across five administrations) by

creating new items and using items from Marsh, Kozan, Wegner, Reid, Yu, and Blair (2010).

Two groupings of twenty items were used in the present study with the first establishing baseline

self-construal in Part 1, and the second assessing changes from baseline self-construal following

the self-affirmation or control writing task in Part 2. Both scales demonstrated good internal

consistency (BIF 1 α = .78; BIF 2 α = .76).

Validity manipulation check. Participants were asked to indicate the extent to which they

were attentive, honest, and distracted while completing this study in order to assess the quality

participants' responding across the questionnaires.

Part 2: Laboratory measures (Appendix C).

Sources of validation. The Sources of Validation Scale (Harber, 1995) required

respondents to rank-order 11 values (e.g., artistic skills/aesthetic appreciation, sense of humor,

relations with family/friends, etc.) by importance from 1 to 11 (1 = most important item; 11 =

least important item). Fortunately for the present purpose, the Sources of Validation Scale does

not include intelligence, knowledge, or some variant thereof as a listed value, thereby eliminating

the concern that participants might directly affirm a value that is later threatened by bogus test

feedback - an outcome that prior research suggests may promote defensive responding (Sherman

& Cohen, 2006). Participants received this scale in Part 2 immediately prior to receiving an

envelope containing the writing task, directing them to write about either their top-ranked (self-

affirmation) or ninth-ranked (control) value. Participants' rankings were reverse-coded in the data

set so that more important values received higher numeric values. Across the sample,

participants overwhelmingly chose "relations with family/friends" as their top-ranked value ($M =$

10.20, $SD = 1.71$), followed by "social skills" ($M = 8.15$, $SD = 2.14$) and "humor" ($M = 7.99$, SD

$= 2.24$).

Values essay. The self-affirmation and control writing exercises (also referred to as values essays) followed a commonly used procedure from Cohen, Aronson, and Steele (2000, Study 3). Students were instructed to write one of two essays about a particular value based on their pattern of ranking on Sources of Validation Scale. Participants in the self-affirmation condition were instructed to write about why their top-ranked value was important to them and provide two examples of when this value had proved meaningful. In the control condition, participant reflected on their ninth-rated value and why it might be important to the typical University of Manitoba student, providing two examples of when it might have proved meaningful. Students in the control task also completed a third filler question asking them to describe how they arrived at the university earlier that day. The control essays' focus on another "typical" student's perspective (vs. one's own perspective) was used in the control condition so as to remove any opportunity for self-reflective writing - a tendency that Cohen and colleagues (2000) note is commonly observed in writing tasks if not otherwise specified.

This manipulation was slightly modified from Cohen and colleagues' (2000) design by requiring participants to describe two examples (vs. one) of when this value has proved meaningful, as well as including the filler task for control participants. The former change was included to promote greater engagement during the self-affirmation writing task, while the latter change was intended to extend the time control participants spent writing their essay so as to be comparable to the duration time for participants in the self-affirmation condition. Participants' duration times were important because the experimenter was blind to participants' experimental condition.

Self-affirmation manipulation check. A five-item self-affirmation manipulation check developed by Napper, Harris, and Epton (2009) was used to determine whether participants

completed the values essays as intended. Sample items include, "This exercise made me think about positive aspects of myself" and "This exercise made me aware of things I value about myself." Affirmed participants were expected to provide stronger endorsement for these items. The scale demonstrated good internal consistency ($\alpha = .78$).

Mood ratings. Participants completed a one-item mood rating at various intervals during the experiment in order to track current mood at critical points in the study, as well as to track changes to participants' moods. Current mood was indicated on a visual analog scale between poles labelled "Terrible" and "Delighted." One-item mood scales have been used elsewhere in the literature as an expedient assessment tool, in contrast to lengthier scales (Strelan & Zdaniuk, 2015). Lingjærde and Føreland (1998) reported that a single-item visual analog mood rating demonstrated high reliability and validity, suggesting that this may be an appropriate and efficient measurement strategy. Mood ratings were assessed as both a potential mediator of self-affirmation effects and as a manipulation check for participants' experiences throughout the study, as decreases in mood were expected following negative feedback and during the Prisoner's Dilemma scenario, relative to baseline).

Brief intelligence test. Intelligence was ostensibly assessed using a 20-item "Brief Intelligence Test" that combined two smaller 10-item tests (Numeric Sequences, Find-the-odd-one-out problems) that were developed by Johnson (1991) and originally adapted from Eysenck's (1966) "Check your own IQ." Johnson's (1991) original instructions were used to describe the test as an unambiguous, reliable measure of intelligence and future performance in university. The Numeric Sequences task asked participants to determine which number from among several options correctly completed a sequence. A sample sequence is as follows: 4 6 9 13 __. Find-the-odd-one-out problems required participants to determine which item in each group does not

belong with the others. A sample problem is: bungalow, hut, tent, office, igloo. Each test

contained 10 items, seven of which were unsolvable; this feature was expected to lead

participants to believe they had performed poorly on the test.

The present study deviated from Johnson (1991, Study 3) in several important respects,

although both formats involved an experimenter administering the test to individual participants.

While Johnson (1991) study gave participants a 60-second time limit and provided immediate

feedback for each item, the present study used a 30-second time limit for each item. Second,

rather than provide feedback after each item, participants in the present study were only provided

feedback at the conclusion of the test as an overall score out of 20. Finally, all participants were

provided with identical bogus performance feedback that they had correctly answered five

questions, which placed them at the 45th percentile, a "slightly below average" score relative to

other first-year university students. These procedural modifications were evaluated in the pilot

study and ultimately retained.

Trivializing. Past research has demonstrated that malicious envy can facilitate goal

disengagement (Lange & Crusius, 2015) while self-affirmation interventions, conversely, may

reduce defensive responding in the face of threat (Sherman, 2013) and even promote a greater

sense of responsibility for one's past social transgressions (Schumann, 2014). Consequently,

envious individuals would ordinarily be expected to trivialize threatening negative performance

feedback regarding their intelligence by disparaging the test or the importance of intelligence to

one's self-concept. This defensive reaction might be expected to be attenuated or even eliminated

among affirmed participants who should experience the test feedback as less threatening. In

order to assess defensive reactions to trivialize one's negative performance feedback on the

bogus intelligence test (e.g., downplay the importance or accuracy of the test), students

completed a brief questionnaire entitled "Reactions to Test Feedback." The questionnaire

contained a mood measure and two author-created items: "My test score accurately reflects my

intellectual abilities" and "The results of this test are pretty important to me." Lower scores were

thought to reflect greater trivialization. However, the scale demonstrated unacceptably low

internal consistency ($\alpha = .41$), likely reflecting the fact that it contained only two items.

Payout matrix. Prior to playing the Prisoner's Dilemma scenario, participants were

provided with a Payout Matrix that indicated the relative payoffs for Player 1 and Player 2 in

each of four possible outcomes (mutual cooperation, mutual competition, cooperate-compete, or

compete-cooperate; see Table 1). All players were assigned to play as Player 1 on the basis of

their ostensibly lower score on the bogus intelligence test. Each possible outcome was described

in more detail in a handout provided to participants (see Appendix C). For the purpose of the

random drawing for cash prizes, participants had the opportunity to earn $0.10 per point

obtained. Player 2 could ostensibly win any value between $0 and $48, although all players

actually played as Player 1 whose earnings were bounded between $0 and $24.

The Prisoner's Dilemma scenario spanned 20 rounds and participants' responses were

classified dichotomously based on whether they chose to cooperate ("1") or compete ("0"). These

scores were converted to a proportion between 0 (competed every round) and 1 (cooperated

every round). Overall, participants' responses displayed a high degree of internal consistency (α

$= .92$).

Table 1

Payout Matrix

		Player 2	
		Cooperate	Compete
Player 1	Cooperate	10 points / 20 points	0 points / 24 points
	Compete	12 points / 0 points	1 point / 2 points

Note. The matrix presents four possible pay-off amounts (in points) based on the mutual decisions of Players 1 and 2. The payoffs for Player 1 are provided first in each cell, followed by Player 2.

Episodic envy. The Episodic Envy Scale (Cohen-Charash, 2009) is a nine-item measure of episodic envy feelings that was embedded within an "Interpersonal Perceptions" questionnaire. The items load on two factors: a Feeling factor assessing negative affective reactions (e.g., hostility, resentment, ill will) and a Comparison factor assessing painful upward social comparisons in relation to an advantaged rival (referred to as "Player X"). The total scale score demonstrated good internal consistency for both administrations (Time 1: $\alpha = .85$; Time 2: $\alpha = .88$).

Other affective reactions. To disguise the purpose of the envy items, they were interspersed among additional items assessing other affective reactions created by the author in the same format as the Episodic Envy Scale (e.g., admire X, like X, want to be friends with X, etc.) in the "Interpersonal Perceptions" questionnaire.

Ultimatum game. Participants were given a brief measure labelled "Gift Distribution Questionnaire" after indicating whether they would accept or reject an unfair division scheme for the $10 gift ostensibly proposed by their opposite-room opponent. If accepted, participants were told they would receive a $2 payout while their opponent would keep $8; if rejected, neither participant would receive any monetary earnings. Participants received one of two versions of

the Gift Distribution Questionnaire depending on whether they accepted or rejected the offer. The questionnaires were identical aside from the inclusion of five items assessing schadenfreude feelings solely on the "rejection" version of the questionnaire, as this decision would create an opportunity for these feelings to emerge. Schadenfreude feelings would be irrelevant for participants who accept the offer as this permits one's opponent to receive the larger monetary prize. The schadenfreude items demonstrated good internal consistency in the present study ($\alpha =$ .74). Both questionnaire versions also asked participants to state why they agreed to (or rejected) the offer in one sentence and write a comment for the opponent about their proposal; participants were not led to believe that their opponent would view this comment.

The reverse side of the questionnaire contained visual analog scales on which participants rated the extent to which they viewed the proposal as fair, liked themselves and their opponent, viewed themselves and their opponent as intelligent, and indicated their current mood. The self-other ratings comprised the indirect envy variable and were subsequently combined to form a difference score for liking and intelligence ratings (self-rating minus other-rating). As a result, high ratings reflected greater liking (and/or intelligence ratings) for oneself relative to one's opponent. Affirmed participants were expected to be less defensive and able to provide a more accurate assessment of their own intellectual ability and engage in less other-derogation, attenuating self-other ratings for liking and intelligence. Combining both difference ratings produced a single item with unacceptably low internal consistency ($\alpha = .54$), likely due to the inclusion of only two items.

   Strategies for coping with envy. Participants were provided with a handout entitled "Coping with Challenging Situations" which provided a brief summary of four strategies based on recommendations from the research literature (e.g., Exline & Zell, 2008; Smith & Kim, 2007)

to help individuals cope with experience of envy. These strategies encouraged emotional control

(avoiding excessive feelings of anger [in order to curb aggressive or destructive behaviours] and

sadness or embarrassment [to reduce chronic depressive states and goal disengagement],

perseverance toward important goals (to reduce goal disengagement), and learning (from

advantaged others to encourage self-improvement). Notably, these strategies diverged as the

former two focused on emotion regulation and the latter two emphasized characteristics of

benign (vs. malicious) envy.

      Part 3: Online measures (Appendix D)

      Past-month experience of envy. Participants were instructed to think back to their most

intense past-month experience of envy and respond to a series of questions. First, participants

were asked to describe the situation by answering: a) "what happened?"; b) "who did you

compare yourself to?"; c) "how were you disadvantaged?"; and, d) "how did you feel about it?"

Separate expandable text boxes were provided for each question.

      Second, participants rated their affective reactions for envy episode they described in

relation to the person who held an important advantage. These reactions included: angry,

admiring (reverse-scored), hostile, sad, inferiority, resentment, and upset because the situation

was unfair. All items were assessed on a three-point scale (with poles of "Not at all" and

"Somewhat intensely"); this scale was originally intended to have five response options for

greater variability but was incorrectly formatted in the online survey. The admiring item was

later dropped due to a low item-total correlation ($r < .25$) and because removing this item

increased the internal consistency of the scale. The resulting six-item scale had good internal

consistency ($\alpha = .73$).

Third, participants indicated the extent to which they used each of the four strategies listed in the "Coping with Challenging Situations" handout presented one month earlier (0 = "Not at all"; 4 = "Very much"). If participants indicated having used the strategy to some degree (by providing rating greater than zero), they were asked to indicate how effective the particular strategy was in helping them cope with envy (0 = "Not at all"; 4 = "Very much"). Participants could also indicate any additional strategies they used in an expandable text box after responding to these items.

Finally, participants completed one item assessing the frequency of envy-related experiences during the past month using a 6-point rating scale (0 = "0"; 1 = "1-2"; 2 = "3-4"; 3 = "5-6"; 4 = "7-8"; 5 = "9+").

Envy-related hassles. Participants completed the Hassles Assessment Scale for Students in College (Sarafino & Ewing, 1999). The scale asked respondents to rate the frequency, unpleasantness, and extent to which they dwelled on each of 54 hassles commonly experienced among students in college or university. Importantly, several of the hassles listed in the scale implied (or could plausibly reflect) upward social comparisons to advantaged others and would likely entail some degree of experienced envy and might therefore be conceptualized as envy-related hassles (e.g., "Grades [e.g., getting a low grade]; Fitness: noticing inadequate physical condition; Appearance of self [e.g., noticing unattractive]). Conversely, other hassles had little or no face validity as envy-related hassles (e.g., "Annoying social behavior of others [e.g., rude, inconsiderate, sexist/racist; Sports team/celebrity performance [e.g., favorite athlete or team losing]).

An empirically-derived procedure was used to constrain the list of hassles to those most likely to reflect envy based primarily on the pattern of correlations of each item with the

Dispositional Envy Scale (DES) and, to a lesser degree, participants' ratings of envy intensity

when recalling their most envy-inducing past-month episode. Items were retained if the

particular hassle exhibited a significant association ($r > .2$, $p < .01$) with the DES across each of

the three domains (Frequency, Unpleasantness, and Dwelled), as well as exhibited at least one

significant association with the intensity of the recalled episode of envy. In total, 10 hassles were

identified and combined into a 30-item scale (10 items x 3 ratings [frequency, unpleasantness,

dwelled]). All items displayed adequate item-total correlations ($r > .35$), with most well in excess

of this minimum. The internal reliability of this composite scale was excellent ($\alpha = .93$).[5,6]

Validity manipulation check. Participants completed the same 3-item validity

manipulation check as at the conclusion of Part 1. Participants were screened based on their

response regarding the extent to which they reported having answered the questions honestly.

Experimental Procedure

Measures of dispositional envy and trait intelligence importance were administered to

prospective research participants as part of a mass testing questionnaire that all Introduction to

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[5] An alternative approach to determining envy-related hassles was considered based on ratings by several independent judges of the relation of each hassle to envy. However, the empirically-based approach presented in-text was retained for several reasons. First, Smith and Kim (2007) note the frequent misconceptions surrounding envy among laypersons, suggesting that judges' evaluations of envy-related hassles may be similarly biased. Second, tying the inclusion of envy-related hassles to dispositional envy is a strong criterion that is not redundant with other dependent variables. Third, the relatively strict criteria ($p < .01$, $r > .2$ with Dispositional Envy Scale for each of the three hassles dimensions) required for inclusion reduces the chance of retaining items that do not reflect envy; the procedure, in fact, appeared to effectively reduce the list of hassles to a manageable number ($n = 10$) of face-valid envy-related hassles.

[6] An alternative summary variable of envy-related hassles was created by multiplying the frequency and unpleasantness ratings for each hassle, and summing these ten scores (one for each envy-related hassle). Under the regular scoring, a participant who provided the following ratings for a particular hassle (Frequency: 4; Unpleasantness: 4; Dwelled: 3) would receive a score of "11." However, under the alternative scoring, the multiplier would grant an exponentially higher score to individuals who participants who frequently experience a particular hassle, and experience it as particularly unpleasant. This participant would receive a score of "16" under this alternative scoring. However, the original summative scoring was utilized in order to retain participants' ratings of the extent to which they dwelled on a particular hassle - an important hassles dimension, as well as due to the extreme non-normality (positive skewness and kurtosis) of the summary variable. As the alternative summary variable required square-root transformation, the summary scores lost their exponential basis (i.e., where hassles that were both frequent and unpleasant were weighted much more heavily than those that were infrequent, only slightly unpleasant, or both), producing an essentially summative variables akin to the one used in-test (although lacking the extent to which participants dwelled on each hassle).

Psychology students are encouraged to complete at the start of the Fall academic term (see

Appendix A for both scales). The mass testing questionnaire contained a collection of screening

measures from student and faculty researchers in the Psychology department within which both

scales were embedded. Dispositional envy scores were collected in order to permit identification

and recruitment of individuals with high levels of the trait. Including measures assessing the

importance of intelligence provided a manipulation check regarding whether the central threat

contained in the study design (to students' intellectual abilities) was important to their self-

concept.

      Prior to recruitment, potential participants who had completed the mass testing

questionnaire were categorized into one of three groups depending on their total score: Low-

Moderate envy ($M < 17$), Moderate-High envy ($17 \leq M < 25$), and High envy ($M \geq 25$). These

values were based on descriptive statistics for the Dispositional Envy Scale reported in Smith et

al's (1999) validation study ($M = 16.98$).[7] While these arbitrary labels were not used in the

analysis, classifying individuals in each of these three groups was performed in order to recruit

approximately equal numbers of individuals from each group in order to over-sample individuals

with higher levels of the trait. A trained research assistant used a randomization function to select

an equivalent number of male and female participants from each of the three categories from the

overall sample to create six data files (Male A-C, Female A-C), stripping the file of dispositional

envy scores. This procedure created a participant recruitment database that was used by the

experimenter to invite participants to sign up for the study while keeping the experimenter blind

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[7] While Smith et al. (1999) do not report the standard deviation for the total scale, it can be calculated to be approximately 8 units, based on the standard deviation for individual items. Consequently, the Low-Moderate envy group includes individuals at or below the mean value, the Moderate-High envy group includes individuals between roughly the scale mean and one standard deviation above the scale mean, and the High envy group includes individuals whose dispositional envy score exceeds the scale mean by at least one standard deviation.

to participants' dispositional envy score. Eligible participants were contacted by email and invited to participate in the study and provided with a password to sign up for a timeslot.

Students were required to sign up for timeslots in both Parts 1 and 2 of the study through the online psychology participant subpool website. In order to control for differences between same-sex and mixed dyads in Part 2, selected timeslots were created that could only be viewed by female (vs. male) students, or vice versa. The study information on the subpool website described this experiment as investigating the relationships among personality, intelligence, values, and mutual decisions.

In Part 1, students were emailed a link from the survey-building website Qualtrics; clicking on the link opened the survey. The link to the survey had a 24-hour expiry; students who did not complete the link by this deadline were sent one reminder email containing a second link with a 24-hour time limit. Participants who did not complete the survey by the second time limit were dropped from the study. Informed consent by obtained by requiring students to click a decision box after reviewing the study description (see Appendix B); alternatively, participants could choose to not complete the survey without penalty. Participants also provided their university email address to permit linking data across experimental phases. Next, participants completed dispositional measures of narcissism (PNI), self-esteem (RSE), self-compassion (SCS), entitlement (PES), level of construal (BIF baseline), a demographic questionnaire and manipulation check (see Appendix B for scales). The presentation of the questionnaires was randomized to prevent any potential order effects. Participants were provided with one research credit for participation in Part 1 (1 research credit was provided for each 0.5 hour unit of research participation as per university research guidelines).

Part 2 occurred approximately seven days following completion of Part 1. The timeslots were scheduled for 90 minutes and participants received three experimental credits for their participation. Two same-sex participants were permitted to sign up for each timeslot. Participants were instructed to meet in an assigned research participation waiting room and were collected individually by the experimenter and moved to either Room A or B, two adjacent lab rooms that contained a table and a large whiteboard. Each participant was instructed to carefully read through a study description for Part 2 of the study and provided written consent to proceed with the experiment. In order to ensure that students did not know their opponent or sign up with a friend, participants were asked individually as to whether they knew the other student in the study while being accompanied to the lab room. This outcome was thought to be unlikely due to the relatively small number of participants invited to participate at a given time on the basis of random assignment, and the fact that posted timeslots were usually filled quickly. Only one dyad indicated that they were friends and had signed up together; these participants were flagged and later removed from the data file.

The experimenter (Neufeld) followed a script throughout this phase of the study (see Appendix E). The experiment was conducted in parallel for participants in each room with the experimenter frequently travelling between the rooms; participants remained in their respective rooms throughout the study and had no interaction. After reading a brief study description and providing written consent to proceed, students indicated a baseline mood rating and received a brief overview of the competitive mutual decision game (Prisoner's Dilemma) in which both players could earn points based on the joint decisions of both players (cooperate vs. compete). Participants viewed a balanced Payoff Matrix (see Appendix C for all measures used in Part 2) in which each player received identical point values in each respective condition to help them

understand the upcoming game. Participants were encouraged to earn as many points as possible

and informed that three participants would later be selected in a random drawing to receive a

cash prize corresponding to the number of points earned during the game (1 point = $0.10).

Following this orientation, participants were given a sealed envelope containing a list of personal

values to rank-order (Sources of Validation scale) and writing prompts for either the self-

affirmation or control values essay and the experimenter exited the room. After completing the

values essay, participants completed a brief self-affirmation manipulation check and the level of

construal questionnaire. Participants were instructed to place all materials into the envelope once

completed and then inform the experimenter that he/she was finished. This procedure ensured

that the experimenter remained blind to experimental condition.

Next, participants completed a difficult timed test developed by Johnson (1991) that

ostensibly assessed intelligence and contained primarily unsolvable items. The experimenter was

present in the room during the test administration to enforce the 30-second time limit for each

item. Once the test was completed, the experimenter pretended to score the test and told each

participant that he/she had answered five questions correctly, a result that corresponded to the

45th percentile relative to other first-year university students and was "slightly below average."[8]

To enhance the plausibility of the obtained grade and marking procedure, the experimenter

marked any correctly completed solvable items as correct, as well as other ambiguous unsolvable

items, until five items were marked as correct. The experimenter consulted a fictitious table

reporting percentile values for each score to supposedly determine participants' percentile score.

Participants provided an estimate of their number of correct answers and a mood rating prior to

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[8] While a score at the 45th percentile would be in the Average range on many conventional intelligence tests, the result is described as slightly below average to enhance the self-threat. This percentile is intended to be below a score most participants would expect to receive, considering that most students believe themselves to be above average in many respects (Dunning, Heath, & Suls, 2004), but not sufficiently low to induce doubt as to the validity of the test.

learning their bogus test score, as well as two items assessing trivializing reactions to the test and their total score after receiving the individualized feedback.

Participants were then informed that their opponent in the adjacent room had correctly answered 13 questions, a performance that was assessed to fall around the 85th percentile - well above average. Consequently, participants were told they would play as "Player 1" during the mutual decision game, while their opponent - by virtue of their superior score on the intelligence test - would play as "Player 2" and receive higher monetary payouts. The experimenter then explained the procedure for the competitive mutual decision game and illustrated the earnings each player would receive in each of the four possible decision outcomes based on an imbalanced Payoff Matrix (see Appendix C) previously used by Parks and colleagues (2002). Notably, Player 2 received twice the payouts as Player 1 in each condition (e.g., if both players cooperated, Player 1 would earn 10 points while Player 2 would earn 20 points). Upon learning of their upcoming disadvantage in the mutual decision game with accompanying concrete illustrations of their inferior outcomes, students provided a mood rating and completed the Episodic Envy Scale (Cohen-Charash, 2009) with reference to their ostensibly smarter, advantaged rival in the adjacent room. The scale was disguised as a measure of "Interpersonal Perceptions" and included several positive emotional and cognitive reactions in amongst the envy items.

Next, participants participated in the 20-round Prisoner's Dilemma, which was referred to as a "Mutual Decision Game." Consistent with the procedure of Parks et al. (2002), participants were not told the total amount of rounds in the game; however, the experimenter informed participants when there were five rounds remaining. Unbeknownst to both players, each competed against a pre-determined tit-for-tat strategy rather than his/her opposite-room

opponent. The strategy always cooperated with the player in round 1, while in subsequent rounds the strategy would copy the player's choice from the previous round.[9] Participants verbally indicated their decision (cooperate, compete) to the experimenter, who alternated between rooms A and B to record participants' decisions. Current scores for both players (each participant and their fictitious opponent) were recorded on a large white board in each room and were updated each round. Participants rated their current mood at the end of each five-round block.

Following the Prisoner's Dilemma scenario, participants completed the Interpersonal Perceptions form a second time to record any changes in envy or mood. Each participant then participated in an ultimatum game (Güth, Schmittberger, & Schwarze, 1982) supposedly involving a $10 cash gift to be paid out at the conclusion of the timeslot. Participants were told that the player who had scored higher in the mutual decision game (i.e., their opponent) would be able to propose how the money is divided, while the participant would be able to decide whether to accept the offer (in which case each player receives the designated amount) or reject the offer (in which case neither player receives any money).

All participants were told that his/her opponent decided to keep $8 and offered them $2. This highly imbalanced division was selected on the basis of previous research examining imbalanced ultimatum offers (Casal, Güth, Jia, & Ploner, 2012; Knight, 2012) and was intended to balance rates of acceptance and rejection, as having too few observations of either outcome would weaken the relationship between this dichotomous variable and other study variables. This ratio, allowing for a $2 profit, was also anticipated to be sufficiently attractive to dissuade participants experiencing lower levels of envy from rejecting the offer as participants experiencing higher levels of envy were expected to do. Pilot testing examined whether this ratio

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[9] Parks and colleagues (2002) observed that dispositionally envious individuals were considerably less likely to cooperate with their opponents, a strategy that inevitably reduces earnings over a multi-round game. These authors also observed that rates of cooperation tend to decline over time (analyzed in four five-round blocks).

produces satisfactory compliance (~40-60% acceptance) and demonstrated a suitable split (60%

acceptance); hence, this ratio was used in the full study.

      After verbally indicating their choice to accept or reject the offer, students completed one

of two Gift Distribution questionnaires corresponding to their choice. Participants who rejected

the ultimatum offer completed a measure of schadenfreude reactions contained within this

questionnaire.

      Participants then received a thorough debriefing that addressed all deceptive elements in

the study design, clearly stated the study objectives, apologized for the use of deception and

provided a rationale for its necessity. Participants' responses to a series of funneled debriefing

questions were recorded by the experimenter and coded for suspiciousness. Participants were

asked not to disclose anything about the study to other potential participants and thanked for

their participation. They were also provided with a list of additional free or low-cost community

resources they could access if they experienced discomfort or distress that extended beyond the

present study. All participants were paid $2 for their participation regardless of whether they

accepted or rejected the offer.

      Prior to leaving the experiment, participants were provided with a one-page

psychoeducational handout entitled "Coping with Challenging Situations" (see Appendix C) and

told that it contained some strategies that prior research has suggested may be effective in coping

with experiences of envy. The experimenter encouraged participants to read the document prior

to leaving the study, as well as take the document with them upon exiting. All participants

received three experimental research credits for taking part in the second phase of the study. In

addition, three participants were randomly selected to receive a $24 cash prize, which was

distributed by a research assistant approximately one month after all data collection was

completed.

An invitation to participate in Part 3 of the study was emailed to all participants who had

attended their Part 2 timeslot approximately one month later. The email contained an

individualized link to the online survey through Qualtrics. As in Part 1, informed consent by

obtained by requiring students to click a decision box after reviewing the study description,

although participants could alternatively choose to not complete the survey without penalty

(none did so).

Participants completed the "Experiences over the Past Month" questionnaire probing their

most intense past-month envy experience and assessed its situational features, participants' range

of affective reactions, and use and helpfulness of particular coping strategies, as well as the

frequency with which they experienced envy during the past month. Participants also completed

the Hassles Assessment Scale for Students in College (Sarafino & Ewing, 1999). Following

these items, respondents completed the same validity manipulation check items (honest,

attentive, distracted) used in Part 1. Respondents received two experimental research credits for

their participation in Part 3 of the study: one credit for completing the Part 3 survey and a bonus

credit for completing all three study phases. This bonus credit was included in order to encourage

completion of the Part 3 survey.

Of note, two pilot studies were conducted prior to commencing the full study in order to

evaluate the study design and manipulations as well as to identify necessary modifications.

Ethical Considerations

Careful attention was given to ethical considerations in the present study as the procedure

was intended to produce experiences of envy – a painful, undesirable experience – among a

student population containing some individuals thought to be susceptible to stronger negative

emotional experiences, such as those with elevated narcissistic traits or dispositional envy. The

experimental design also involved withholding certain information (e.g., the full purpose of the

study) and purposefully deceiving participants regarding certain aspects of the study, including

negative performance feedback on a bogus test supposedly predictive of future academic success

and information regarding their opposite-room opponent's intellectual performance and decisions

throughout the study. Certain safeguards for participant welfare were consequently enacted

within the post-experimental debriefing to ensure that they experienced only minimal risk (no

more than in everyday life), correct negative reactions to study participation at the soonest

opportunity, and facilitate participants' positive feelings about themselves and their participation

in the study.

A thorough individualized post-experimental debriefing was conducted with each

participant. Consistent with recommendations by Tesch (1977), the debriefing aimed to satisfy

an ethical function of undoing deception and removing negative consequences of an experiment,

an educational function to inform participants about the study's purpose, and a methodological

function to check the success of the experimental manipulation, measures, and procedures. A

funneled debriefing procedure (Bargh & Chartrand, 2000) was used to systematically proceed

from broad questions about the study to focusing on anomalous aspects of the experiment.

Participants chose to answer in as much or little detail as they felt comfortable and were provided

with opportunities to discuss their emotional experiences during the study, if desired, in line with

recommendations elsewhere (e.g., Sharpe & Faye, 2009). This approach has been widely used as

a suspiciousness check for participants' awareness of the study's purpose and interrelations

among elements (Bargh & Chartrand, 2000) and are thought to help participants regain a sense of

mastery rather than feel tricked following an experiment incorporating deception (Johnson, 1991). Participants' responses were recorded and later evaluated for suspiciousness and possible removal from the database.

A concise summary of the experiment's purpose and objectives was provided to participants following the funneled debriefing to increase their understanding of experimental research, both generally and with regard to this particular study. Consistent with Sharpe and Faye's (2009) suggestion, participants were also explicitly dehoaxed as to the bogus nature of the purported intelligence test and informed that effects of negative feedback may persist for a short period beyond the experiment. An apology was offered for the use of deception and any unpleasant reactions experienced during the study. All participants received a handout that listed several free psychological resources they could utilize in the event that feelings of discomfort or distress persisted beyond the study. The handout also contained contact information for the experimenter and research supervisor.

Analysis Strategy

Direct comparison between self-affirmation and control groups on outcome variables was conducted via independent samples *t*-tests (Hypotheses 1-3). Evaluation of mediation and moderation (Hypotheses 4-5) was performed using a PROCESS macro for SPSS developed by Hayes (2012). This approach holds important advantages over the causal steps approach to mediation popularized by Baron and Kenny (1986). As Hayes (2013) notes, the causal steps approach tends to be low in power, makes unnecessary assumptions such as requiring a significant direct X-Y effect for mediation analysis to proceed, and does not directly test or quantify the indirect effect. The PROCESS macro also permitted simultaneous analysis of mediation and moderation effects to determine whether mediation effects were, in turn,

moderated by other variables. Estimates of the indirect effect were generated based on an

analysis of a random sample with replacement from collected data. This resampling procedure

does not make assumptions about the shape of the distribution of the indirect effect unlike the

Sobel procedure that accompanies the causal steps approach (Hayes, 2013). The resulting

indirect effects were ranked in order of magnitude and the most extreme 2.5% on either tail are

removed from the analysis, thereby generating a 95% confidence interval for values of the

indirect effect. Confidence intervals that do not contain zero suggest that the null hypothesis can

be reasonably rejected in favour of a significant mediation effect. All analyses used 95% bias-

corrected estimates of the indirect effect based on 10,000 samples.

Potential mediators (level of construal, mood) and moderators (dispositional envy,

vulnerable and grandiose narcissism, self-esteem, self-compassion, entitlement, and sex) were

assessed separately, then in pairs in order to detect nuanced mediator or moderator effects.

Moreover, combinations involving one of each mediator and moderator variable were also

examined to assess for potential conditional process effects. These additional analyses were

intended to further illuminate how self-affirmation interventions may attenuate envy reactions

and determine with greater precision for whom the intervention was, or was not, effective. A

conceptual model illustrating this conditional process analysis is presented in Figure 1 and

corresponds to PROCESS model template 8 (Hayes, 2012; Hayes, 2013). The model depicts a

predictive relationship between experimental condition (X) and envy outcomes (Y) that is

mediated by a third variable (M). In turn, the direct (X-Y) and indirect (X-M) effects are

potentially moderated by another variable (W).
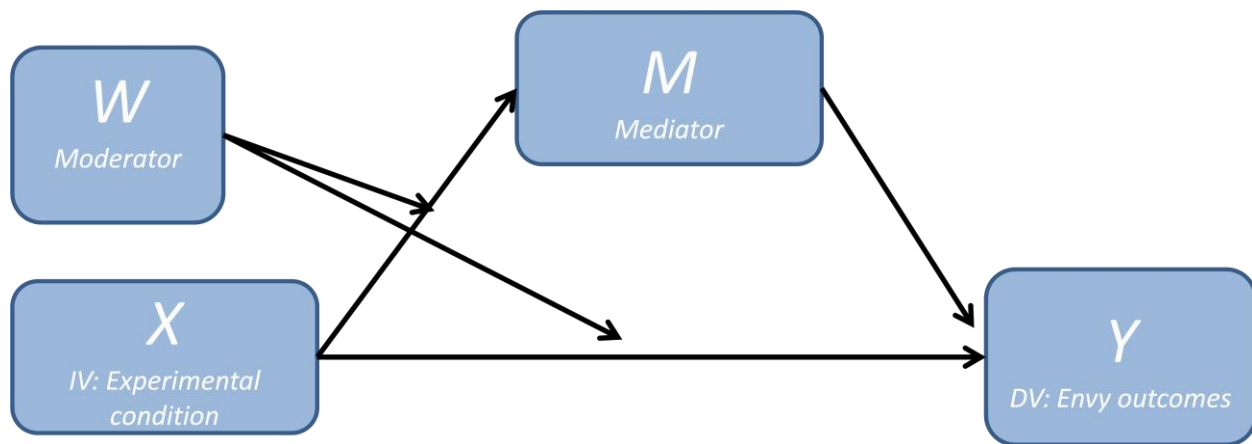
Figure 1. Conceptual model illustrating a conditional process model. X = Independent variable, Y = Dependent variable, M = Mediator, W = Moderator.

Pilot Test 1

An initial pilot test was conducted in order to determine whether: 1) the experimental design effectively induced feelings of envy among participants; 2) participants would be inclined to make relatively balanced choices ($.2 < M < .8$) on the Prisoner's Dilemma (between "cooperate" and "compete") and Ultimatum games (between "accept" and "reject"); 3) participants were suspicious of the study's true purpose or specific elements of its design; and 4) the debriefing procedure successfully ameliorated negative reactions on part of participants.

A total of 15 participants completed the first pilot study (8 control, 7 self-affirmation; randomly assigned). Participants reported experiencing moderately intense envy, as assessed by their ratings on the Episodic Envy scale ($M = 28.68$[10], $SD = 9.93$, observed range: 13-52, possible range: 9-63; item $M = 3.19$ on 7-point scale) and comments during individualized, extended debriefing conducted with each participant after the experiment was concluded. These results support the conclusion that the study design effectively elicited feelings of envy among student participants.

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[10] This mean score exceeds values reported elsewhere in the research literature. For comparison, Neufeld and Johnson (2016) report *M*s (*SDs*) of 23.61 (10.25; Study 1) and 18.71 (8.06; Study 2).

Examining participants' choices during the Prisoner's Dilemma and Ultimatum games suggested an adequate balance across both response options. In the Prisoner's Dilemma game, participants chose to cooperate in 44.35% of trials ($M = 8.68$ [across 20 rounds], $SD = 8.32$, observed and possible ranges: 0-20). In the Ultimatum game, 60% of participants chose to accept the unfair \$2 offer. These outcomes suggested that no modifications to the reward structure of either game were necessary.

Extensive, individualized debriefing sessions were conducted with participants, first by following the written debriefing script, and later by asking more detailed follow-up questions to examine participants' experience throughout the study. Participants' responses suggested that they believed their bogus failure feedback to be genuine and perceived the test to be surprisingly difficult, they experienced some degree of envy toward their ostensibly smarter opponent, and they were not suspicious about the purpose of the study or specific deceptive elements therein. Despite experiencing negative emotions during the course of the study, the vast majority of participants indicated that these feelings had dissipated during the debriefing session and noted that they found the study interesting and were pleased to have participated. No participants reported ongoing distress or discomfort or acknowledged these emotions when queried.

Mean comparisons across experimental conditions were also examined for central study variables (all mean comparisons involved standardized residuals that controlled for dispositional envy and importance of intelligence). Affirmed participants reported significantly higher envy toward their rival (Affirmed: $\bar{x} = 31.86$, Control: $\bar{x} = 25.86$; $t = -2.72$, $p = .017$) and a tendency to like themselves to a greater extent than their opponent on liking difference ratings (Affirmed: $\bar{x} = 1.41$, Control: $\bar{x} = -.50$; $t = -2.85$, $p = .014$), relative to control participants. While not statistically significant, affirmed participants were also somewhat less cooperative (Affirmed: $\bar{x} = 35.0\%$

cooperation, Control: $\bar{x}$ = 52.5% cooperation) and less likely to accept the ultimatum offer

(Affirmed: $\bar{x}$ = 57.1% acceptance; Control: $\bar{x}$ = 62.5% acceptance). While the pattern of findings

across experimental conditions is surprising, careful scrutiny of the data file confirmed that

variables were accurately entered and created (in the case of summary variables). Due to the

extremely small sample size of this pilot study, it is difficult to determine if these differences

were reliable and replicable, or reflect unique variance from the obtained sample.

Taken together, the results of the initial pilot study suggested that despite some surprising

patterns of results, the study design was successful in reliably eliciting participants' feelings of

envy without arousing undue suspicion or negatively impacting participants' wellbeing beyond a

brief and transitory negative emotional state.

Pilot Test 2

A second pilot test including all three phases of the study was conducted in order to

ensure quality control across the entire study, primarily via assessing the magnitude and direction

of associations between study variables. A total of 18 participants (9 control, 9 self-affirmation;

randomly assigned) completed all three phases of the study. No significant problems were

identified in each of the three phases in the study that necessitated modifications to the study. On

the whole, participants completed their Part 1 and Part 3 surveys within an appropriate amount of

time and appeared to provide honest and forthright responses. Specifically, screening of

participants' responses to questionnaires did not suggest obvious response patterns, participants

indicated that they provided honest responses, and the examples of past-month envy experiences

were appropriate (e.g., a sibling or friend's superior accomplishments; a friend's financial

security; a classmate's higher mark on a midterm; others' superior wealth or ease of success;

etc.).

The pilot study 2 sample was later combined with the full study data in order to expand

the sample size of the study and power to detect significant treatment effects. The lack of

substantive changes across all three studies indicate that participants in each group (pilot study 2,

full study) experienced identical procedures throughout the study. Means comparisons across

these groups suggested equivalence across most study measures,[11] justifying their merger into

one larger data set.

Preliminary Analyses and Data Inspection

Prior to data analyses, study variables were inspected for accuracy of data entry, missing

or out-of-range values, qualitative indicators that would warrant removal from analysis (e.g.,

failure to follow instructions, suspiciousness), and violations of the assumptions of t-test and

multivariate analyses. In total, 262 participants enrolled in the study (signing up for parts 1 and

2). Of these participants, 30 students either did not attend their Part 2 testing session or dropped

the study after completing the Part 1 survey; all were subsequently removed from the data set.

Additional participants were removed due to a high proportion of missing Part 1 data across

several scales ($n = 1$) or an unusually short Part 1 completion time (4 minutes; $n = 1$). Two

participants were removed from analyses as they had not completed the mass testing

questionnaires (containing the Dispositional Envy Scale and importance of intelligence items).

All participants indicated that they had answered the Part 1 questionnaires honestly (rating ≥ 3

on 5-point scale). See Table 2 for a summary of all participant removals by reason across both

control and treatment conditions.

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[11] Participants were sufficiently equivalent (non-significant p-values) on all central measures across parts 1-3 of the study (t-tests were conducted across 23 measures in total) except for the Behavior Identification Form (Part 1; $t =$ 2.73, $p < .05$) and the Intelligence difference rating ($t = -2.12$, $p < .05$). Specifically, participants in the full study exhibited a significantly more abstract level of self-construal and a greater discrepancy between self- and other-ratings for intelligence (favouring their opponent as more intelligent).

Table 2

Summary of Excluded Participants Listed by Reason for Removal

	Experimental condition		
Reason for removal	(Not yet assigned)	Control	Self-affirmation
No Part 2 data (30)	30		
Missing data - Part 1	1		
Short Part 1 completion time	1		
No mass testing data		0	2
Content of Part 2 essays		4	2
Discontinued participation - Part 2		0	1
Missing data - Part 2		0	1
Debriefing (suspiciousness, knew opponent)		4	4
Multivariate outliers		2	1
Total *n* deleted	32	10	11
Final *n* by condition		105	104

Note. Participants were randomly assigned to an experimental condition in Part 2 of the study.

Examining participants' Part 2 data, six participants were removed on the basis of the

content of their written essays (i.e., did not follow the essay instructions), while eight participants

were removed due to their responses during the debriefing[12]. One student discontinued

participation in the study during the Part 2 timeslot,[13] while a second participant was removed for

omitting several rating scales including self-reported envy ratings. Three participants were later

removed after being identified as multivariate outliers (discussed in the next section). Following

these removals, 209 participants were retained who had completed Parts 1 and 2 of the study.

Among the 209 participants who provided usable data for Parts 1 and 2, 174 completed

the Part 3 follow-up survey sent one month after the Part 2 in-person component. Three of these

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[12] Participants flagged for removal reported either suspicion that their opponent may have been given identical feedback to their own in a parallel procedure (*n* = 3), that their own score was bogus and predetermined (*n*=1), or that there was no opponent in the next room and that their rival's score was bogus (*n* = 2). An additional two participants who were later removed had indicated having signed up jointly for the study and stated that they were close friends (*n* = 2). While a sizeable proportion of the sample expressed skepticism about whether the intelligence test was valid (~10-15% of sample), they gave no indications that they did not believe the performance feedback to be accurate.

[13] This participant chose to terminate her participation in the study upon hearing her bogus performance feedback on the intelligence test. She was immediately debriefed by the experimenter, provided with a list of the recommended envy-reducing strategies and community mental health resources, and received $2 for her participation. This participant expressed that she felt quite relieved following the feedback received during the debriefing.

respondents had omitted significant portions of the Part 3 questionnaires and/or exhibited an

unusually fast response time suggestive of careless responding (<5 minutes); consequently, their

Part 3 data was deleted. Participants' most intense past-month envy-inducing experience recalled

were also reviewed for quality of responding. In general, participants appeared to provide

suitable examples of envy involving invidious comparisons to others.[14] One participant's Part 3

data were removed because the event he described did not involve an experience of envy and

explicitly denied feeling any envy-related affect. A small subset of participants ($n = 9$) selected

their experience during Part 2 of the study as their most intense past-month experience involving

envy. However, all but one participant described accounts that were consistent with an

experience of envy (e.g., indicating feelings of sadness or anger; believing their opponent was

more intelligent; expressing personal inferiority beliefs) and were retained in the analysis; the

remaining participant's Part 3 data were deleted. In total, 169 participants (87 self-affirmation, 82

control) provided usable Part 3 data - 80.9% of the sample of 209 participants retained in Parts 1

and 2.

<div align="center">

Results

</div>

Data Preparation

    Missing data.

    Next, total scores for each scale were created by summing all items in the scale. Missing

data points were computed within the total scale score using mean estimation (substituting in the

sample mean on a particular item in place of the missing value) in cases where participants

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[14] Participants' responses pertained to upward social comparisons across a variety of domains including academics
(typically a recent test or exam score), physical appearance (e.g., perceiving others as taller, thinner, more muscular,
or more attractive), possessions (e.g., a new car or phone; another person's superior finances or financial security), a
recent performance (e.g., losing a competitive sporting event), or abilities (e.g., a rival with better musical or athletic
ability).

answered at least 80% of all items. This procedure produced 11 unique data points. Scale totals

for which less than 80% of items were completed were not estimated.

Assessment of normality.

Normality was assessed by examining the descriptive statistics of each scale and

inspecting values of skewness and kurtosis. As Kline (2008) notes, absolute z-scores in excess of

3 for skewness, and 10 for kurtosis, may be considered extreme. Scales or items with skewness

statistics near or exceeding this threshold were square-root transformed to normalize their

distributions;[15] consequently, only one item (ultimatum decision) had skewness statistics, and

none had kurtosis statistics, exceeding these recommended maximums.

Univartiate outliers were examined separately within the self-affirmation and control

conditions by examining z-scores for each participant across all scale totals (including single-

item measures, such as the proportion of overall cooperation in the PD game). Following the

recommendations of Tabachnick and Fidell (2007), extreme outliers ($z > 3.29$) were identified

and their values were recoded to be one unit more extreme than the next-most extreme value,

thereby preserving each participant's rank position on a measure but reducing the impact of a

particular extreme univariate outlier. Four extreme ratings were identified for the Part 3 rating of

the number of past-month envy experiences in the control condition ($z = 3.75$). However, these

values were not changed due to the restricted range of this single-item measure and

meaningfulness of the responses.

Multivariate outliers were examined by calculating Mahalanobis distance values for each

case in a regression analysis using a conventional, but conservative, cut-off value of $p < .001$

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[15] Square-root transformed scales and items include the proportion of cooperation in Prisoner's Dilemma (PD) game, total earnings (self, opponent) in PD game, Episodic Envy Scale (second administration post-PD game), Schadenfreude scale, Post-ultimatum game rating items: calm/angry, fairness of ultimatum offer, intelligence of opponent; Strategy: Try Harder (extent of use; helpfulness); Hassles: Frequency, Unpleasantness, Dwelled.

(Tabachnick & Fidell, 2007).[16] Among controls, two multivariate outliers were identified and removed; one multivariate outlier was identified and removed in the self-affirmation condition.

Following these removals, the dataset was reduced to 209 participants who provided adequate and sufficient data through Parts 1 and 2 of the study (105 control, 104 self-affirmation), of whom 169 (82 control, 87 self-affirmation) provided usable Part 3 data. Demographic information for retained participants is presented in Table 1, including separate columns depending on whether or not participants completed Part 3 of the study (as dependent variables measured in Part 2 and Part 3 had different Ns).

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[16] Independent variables included: DES, Importance of Intelligence scale, SCS, PNI, PES, BIF (T1), BIF (T2), Episodic Envy Scale (T1 & T2), proportion of overall cooperation across PD game, Envy composite (Part 3), Number of past-month envy experiences, and Hassles Assessment Scale: Frequency, Unpleasantness, Dwelled.

Table 3

Participant Demographics

Demographic variable	Descriptor	Status across study	
		Parts 1 and 2 only	Completed entire study
N		209	169 (80.9%)
Age (Range)		19.31 (17-38)	19.40 (17-38)
Sex	Female	119 (56.9%)	98 (58.0%)
	Male	90 (43.1%)	71 (42.0%)
Year in university	1	165 (78.9%)	133 (78.7%)
	2	27 (12.9%)	22 (13.0%)
	3	13 (6.2%)	11 (6.5%)
	4	4 (1.9%)	3 (1.8%)
First Language	English	180 (86.1%)	145 (85.8%)
	French	1 (0.5%)	1 (0.6%)
	Other	28 (13.4%)	23 (13.6%)
Ethnicity	Aboriginal/First Nations	6 (2.9%)	4 (2.4%)
	Arab/West Asian	3 (1.4%)	2 (1.2%)
	Black (African)	7 (3.3%)	5 (3.0%)
	Chinese	7 (3.3%)	6 (3.6%)
	Filipino	25 (12.0%)	20 (11.8%)
	Japanese	1 (0.5%)	1 (0.6%)
	Korean	1 (0.5%)	0 (0%)
	Latin American	1 (0.5%)	1 (0.6%)
	Métis	12 (5.7%)	8 (4.7%)
	South Asian	9 (4.3%)	9 (5.3%)
	South East Asian	2 (1.0%)	1 (0.6%)
	White/European	129 (61.7%)	107 (63.3%)
	Other	6 (2.9%)	5 (3.0%)

Episodic envy manipulation checks.

Episodic envy scores were examined to provide information about the effectiveness of

the manipulation and determine whether cases who endorsed the minimum possible score on the

envy measure (*n* = 5) provided genuine responses. Overall, the mean envy score (*M* = 25.78, *SD*

= 9.79) was comparable or higher to values reported elsewhere (Neufeld & Johnson, 2016)

suggesting successful envy induction, with observed scores that spanned the entire possible

range. Participants who reported a minimum score were within two standard deviations of the

scale mean and were approximately evenly divided between experimental conditions (Self-

affirmation $n = 5$, Control $n = 4$). Independent mean comparisons between these participants' scores and the total sample across other Part 1 and 2 variables indicated that these individuals had significantly lower dispositional envy and higher self-esteem, and their overall mood was less affected by the upward comparison (all ps <.05). Moreover, excluding this participant subset did not alter the vast majority of findings for between-group comparisons but weakened most correlations, Consequently, these participants were retained in the data set.

Descriptive Statistics

Means, standard deviations, possible and observed ranges, and normality statistics (skewness, kurtosis) for all variables across the entire participant sample are presented in Tables 4 through 6. Square root transformations were used to normalize heavily skewed scale distributions that emerged across both experimental conditions.

Table 4 reports scale properties for measures administered during mass testing and Part 1. Consistent with intentions to recruit a more envy-prone undergraduate sample, the scale mean for the Dispositional Envy Scale ($M = 19.11$, $SD = 7.21$) was higher than reported elsewhere ($M = 16.98$, SD unknown; Smith et al., 1999). Observed scores spanned most of the total range of possible scores across the majority of measures, suggestive of a heterogeneous participant sample whose results may better generalize beyond the student sample.

Table 4

Means, Standard Deviations, Possible and Actual Range of Scores, and Assessment of Normality for Mass Testing and Part 1 Study Variables

Phase of Study	Variable	Items	Descriptive statistics		Range of scores		Normality statistics	
			M	*SD*	Observed	Possible	Skewness	Kurtosis
MT	Dispositional envy	8	19.11	7.21	8-37	8-40	.38	-.68
	Importance of intelligence	3	20.28	4.04	10-27	3-27	-.30	-.44
Part 1	Self-compassion	26	76.89	15.18	32-117	26-130	-.21	-.23
	Grandiose narcissism	18	60.05	11.13	27-88	18-90	-.35	.19
	Vulnerable narcissism	34	94.14	23.36	43-155	34-170	-.06	-.49
	Entitlement	9	29.52	10.21	9-56	9-63	.15	-.43
	Self-esteem	10	29.46	5.13	15-40	10-40	-.10	-.47
	Self-construal (Part 1 baseline)[a]	20	15.33	3.44	2-20	0-20	.41	.23

Note. MT = Mass testing phase. The standard errors for skewness and kurtosis vary slightly across variables due to missing data on some single-item measures. The standard errors of skewness range from .168 to .170, while the standard errors of kurtosis range from .335 to .338.

[a] Denotes scales or items that were square-root transformed to normalize their distributions (transformed skewness and kurtosis statistics are reported in the table). The means, standard deviations and observed ranges reflect the untransformed scales.

Scale properties for Part 2 measures are presented in Table 5. Total scores on the majority of scales spanned most of the range of possible scores. Variables related to the Prisoner's Dilemma game (overall percentage of cooperative choices, earnings for both players) and the schadenfreude measure were square-root transformed, which normalized their distributions in both experimental conditions. While the ultimatum decision was heavily skewed as most participants accepted the ultimatum offer, the item could not be transformed due to its dichotomous scoring. While originally intended to represent an alternative behavioural manifestation of envy, this item's heavily skewed distribution and dichotomous scoring precluded its use as a meaningful dependent variable.

Table 5

Means, Standard Deviations, Possible and Actual Range of Scores, and Assessment of Normality for Part 2 Variables

Variable	Condition	Items	Descriptive statistics		Range of scores		Normality statistics	
			M	*SD*	Observed	Possible	Skewness	Kurtosis
Self-construal (Part 2)	Control	20	13.70	3.36	4-20	0-20	-.35	.26
	Self-affirmation		13.31	3.91	2-20		-.44	.20
Change in self-construal (T1-T2)	Control	n/a	-1.45	2.61	(-8)-6	+/- 20	.17	.14
	Self-affirmation		-2.19	2.78	(-10)-4		-.18	-.18
Trivializing	Control	2	7.32	1.50	4-10	2-10	-.16	-.35
	Self-affirmation		7.43	1.65	4-10		-.03	-.94
Change in mood	Control	n/a	-4.28	2.57	(-11.4)-2	+/-12.9	-.51	.48
	Self-affirmation		-4.15	3.01	(-12.7)-1.8		-.56	.06
Episodic envy T1	Control	9	27.19	9.74	9-46	9-63	-.16	-.90
	Self-affirmation		24.36	9.68	9-49		.21	-.87
Percentage of cooperation (PD)[a]	Control	20	43.71	28.91	0-100	0-100	-.43	.16
	Self-affirmation		46.39	32.70	0-100		-.29	-.62
Episodic envy T2[a]	Control	9	21.46	9.35	9-44	9-63	.11	-1.00
	Self-affirmation		19.86	9.54	9-51		.49	-.48
Ultimatum decision	Control	n/a	.85	.35	0-1	0-1	-2.04	2.20
	Self-affirmation		.76	.43	0-1		-1.23	-.49
Schadenfreude[a]	Control	5	22.63	5.15	15-32	5-35	-.05	-.92
	Self-affirmation		21.04	5.38	11-35		.23	.50
Liking difference	Control	n/a	.58	1.77	(-4.0)-4.6	+/- 8.7	-.01	.18
	Self-affirmation		1.08	1.76	(-4.1)-4.7		-.25	.07
Intelligence difference	Control	n/a	-1.63	1.95	(-6.4)-3.5	+/- 8.7	-.33	-.23
	Self-affirmation		-1.70	2.48	(-7.5)-5.4		-.16	-.21

Note. The standard errors for skewness and kurtosis vary slightly across variables due to missing data on some single-item measures. The schadenfreude measure was only completed by participants who rejected the ultimatum offer ($n = 39$). The standard errors of skewness generally ranged from .236 to .238 (.481 for schadenfreude scale), while the standard errors of kurtosis generally ranged from .467 to .472 (.935 for schadenfreude scale).

[a] Denotes scales or items that were square-root transformed to normalize their distributions (transformed skewness and kurtosis statistics are reported in the table). The means, standard deviations and observed ranges reflect the untransformed scales.

Effectiveness of threat induction.

Several points of evidence suggested that students experienced the self-integrity threat in the domain of academics as threatening. Mass testing data indicated that students generally placed high importance on intelligence and viewed it as central to their self-concept.[17] Participants' worsened mood ratings from baseline to post-threat also supports this conclusion.[18] During the debriefing, participants invariably commented that the intelligence test was difficult and produced a negative reaction (e.g., self-doubt, disappointment, feeling "under pressure"), consistent with visible signs of stress observable to the experimenter during the test administration. Appropriate safeguards were put in place to protect participants' wellbeing, the specific elements of which were reviewed earlier in the Method section of this paper.

Envy induction manipulation check.

The available evidence also suggests that the envy induction was successful. The mean self-reported envy score across the total sample ($M = 25.78$, $SD = 9.79$) exceeds those reported by Neufeld and Johnson (2015)[19] using alternative, lower-intensity envy induction paradigms. In addition, participants frequently verified that the experiment elicited some degree of envy feelings when debriefed at the conclusion of Part 2. Suspiciousness probes during the debriefing, as noted earlier, confirmed that participants believed another student was present in the adjacent room and was in direct competition with them, while also being unaware of the study purpose.

Validity of self-affirmation manipulation.

Review of a range of manipulation checks suggested that the self-affirmation manipulation was effective. Relative to controls, affirmed participants were significantly more

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[17] Average item-level response on Importance of Intelligence questionnaire: $M = 6.76$ on a 1-9 point scale. Higher scores indicated greater importance.
[18] Baseline: $M = 9.18$, $SD = 2.03$; Post-threat: $M = 4.97$, $SD = 2.56$. Higher scores indicated a more positive mood.
[19] Study 1: $M = 23.61$, $SD = 10.25$; Study 2: $M = 18.71$, $SD = 8.06$.

likely to perceive the writing task as having affirmed personally important values ($t = 5.58$, $p <$ .001, $d = .77$ [95% CI: .49, 1.05]) on a standard self-affirmation manipulation check scale (Napper et al., 2009). Examining the content of participants' written essays across both experimental conditions further suggested that they followed instructions: affirmed participants generated self-relevant essays for their top-ranked value, whereas controls produced externalized essays involving a "typical" university student and why he/she might value the participant's ninth-ranked value. However, six participants' essays did not adhere to the instructions and were consequently removed from the dataset following this screening procedure. Four participants in the control condition were flagged for removal because their essays were focused on their personal experience with the identified value (as opposed to that of another University of Manitoba student, as per the essay instructions). Two participants in the self-affirmation condition were removed because they either wrote a self-disparaging essay about one's physical appearance ($n = 1$) or affirmed all 11 values ($n = 1$). The available evidence suggests that the remaining participants completed the writing task as intended, consistent with prior studies using the values essay paradigm, supporting the validity of the self-affirmation manipulation.

Scale properties for Part 3 measures are presented in Table 6. Total scores on the majority of scales spanned most of the range of possible scores. Square-root transformations normalized the distributions of selected single items and one subscale of the hassles scale.

Table 6

Means, Standard Deviations, Possible and Actual Range of Scores, and Assessment of Normality for Part 3 Variables

Variable	Condition	Items	Descriptive statistics		Range of scores		Normality statistics	
			M	*SD*	Observed	Possible	Skewness	Kurtosis
Envy composite	Control	6	4.76	2.54	0-10	0-12	.14	-.63
	Self-affirmation		4.54	2.91	0-11		.43	-.69
Angry	Control		.74	.62	(all 0-2)	(all 0-2)	.24	-.59
	Self-affirmation		.76	.70			.37	-.89
Admiring[a]	Control		1.29	.68			-.43	-.77
	Self-affirmation		1.13	.76			-.22	-1.22
Hostile[b]	Control		.40	.54			.57	-1.59
	Self-affirmation		.40	.58			.71	.31
Sad	Control		1.07	.77			-.13	-1.28
	Self-affirmation		1.05	.73			-.07	-1.35
Inferiority	Control		.88	.74			.20	-1.15
	Self-affirmation		.99	.77			.02	-1.09
Resentment	Control		.77	.73			.39	-1.01
	Self-affirmation		.62	.72			.72	-.74
Upset about unfairness	Control		.89	.74			.18	-1.12
	Self-affirmation		.72	.73			.48	-.97
Strategies: Extent of use		4						
EC: Anger	Control		2.20	1.06	(all 0-4)	(all 0-4)	-.47	-.08
	Self-affirmation		2.18	1.27			-.36	-.75
EC: Sad/Embarrassed	Control		2.17	1.13			-.35	-.62
	Self-affirmation		2.43	1.15			-.52	-.38
Perseverance[b]	Control		2.68	1.11			.43	-.94
	Self-affirmation		3.14	.99			-.18	-1.43
Learning from others	Control		1.83	1.15			.09	-.79
	Self-affirmation		2.20	1.27			-.16	-.93
Strategies: Helpfulness[c]		4						
EC: Anger	Control		2.31	1.03	(all 0-4)	(all 0-4)	.03	-.61
	Self-affirmation		2.45	1.04			-.32	-.30

Variable	Group	N	M	SD	Observed Range	Possible Range	Skewness	Kurtosis
EC: Sad/ Embarrassed	Control		2.22	1.13			.03	-.73
	Self-affirmation		2.35	1.21			-.36	-.61
Perseverance[b]	Control		2.62	1.12			.52	-.84
	Self-affirmation		2.96	1.13			-.08	-1.50
Learning from others	Control		2.01	1.12			.10	-.61
	Self-affirmation		2.34	1.20			-.08	-1.00
Number of past-month envy experiences[d]	Control	1	1.54	.98	0-5	0-5	2.01	4.15
	Self-affirmation		1.46	.82	0-4		1.44	2.49
Hassles: Frequency[b]	Control	54	94.57	34.30	17-187	0-270	-.37	.36
	Self-affirmation		101.19	33.37	33-204		.08	.01
Hassles: Unpleasantness[b]	Control	54	76.35	33.57	7-170	0-216	-.35	.44
	Self-affirmation		78.32	32.41	8-158		-.34	-.10
Hassles: Dwelled[b]	Control	54	109.96	35.56	54-208	54-270	.47	-.01
	Self-affirmation		116.26	37.07	59-223		.27	-.61
Envy-related hassles	Control	30	62.32	22.07	15-117	10-140	.29	-.12
	Self-affirmation		64.28	21.01	21-124		.29	-.37

Note. EC = Emotional control. The standard errors for skewness and kurtosis vary slightly across variables; the standard errors of skewness range from .255 to .281, while the standard errors of kurtosis range from .511 to .541.

[a] The Admiration item was reverse-scored and was excluded from the envy composite. [b] Denotes scales or items that were square-root transformed to normalize their distributions (transformed skewness and kurtosis statistics are reported in the table). The means, standard deviations and observed ranges reflect the untransformed scales. [c] Participants were asked to what extent they found each strategy helpful if they had indicated having used it in the past month. [d] 0 = none, 1 = 1-2 experiences, 2 = 3-4 experiences, 3 = 5-6 experiences, 4 = 7-8 experiences, 5 = 9+ experiences.

Comparisons Across Experimental Conditions

Determining group equivalence.

Mean comparisons across self-affirmation and control groups revealed no significant differences across the dispositional variables assessed during mass testing and Part 1, consistent with random assignment to experimental condition (see Table 7). These results suggest that both groups were sufficiently equivalent prior to the self-affirmation writing treatment intervention. Effect size calculations for all means comparisons were generated using an SPSS syntax file made available online by Wuensch (2012).

Table 7

Means Comparisons Across Mass Testing and Part 1 Variables to Determine Group Equivalence

		Experimental condition				Means comparison		Effect size	Confidence interval (95%)	
		Control		Self-affirmation						
Phase of Study	Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*	*Lower*	*Upper*
MT	Dispositional envy	19.39	7.13	18.94	7.32	-.55	.580	-.08	-.35	.20
	Importance of intelligence	19.91	4.30	20.57	4.02	1.13	.260	.16	-.12	.43
Part 1	Self-compassion	75.59	15.63	78.21	14.67	1.25	.212	.17	-.10	.45
	Grandiose narcissism	60.16	9.91	59.94	12.28	-.14	.888	-.02	-.29	.25
	Vulnerable narcissism	95.79	22.02	92.47	24.63	-1.03	.305	-.14	-.41	.13
	Entitlement	28.61	9.47	30.43	10.88	1.29	.198	.18	-.09	.45
	Self-esteem	29.20	5.13	29.72	5.14	.73	.464	.10	-.17	.37
	Self-construal (T1)[a,b]	15.15	3.26	15.50	3.62	1.12	.263	.10	-.17	.37

Note. MT = Mass testing phase.
[a] The self-construal measure was square-root transformed to normalize its distribution; however, the means and standard deviations reported reflect the untransformed scales. [b] Indicates that Levene's test for homogeneity of variance had $p < .05$, and *t*-tests do not assume equal variances across groups.

Means comparisons involving Part 2 measures are presented in Table 8. Selected comparisons of interest are discussed under separate headings.

Table 8

Means Comparisons Across Experimental Conditions for Part 2 Study Variables

	Experimental condition				Means comparison		Effect size	Confidence interval (95%)	
	Control		Self-affirmation						
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*	*Lower*	*Upper*
Self-construal (Part 2)	13.70	3.36	13.31	3.91	.79	.432	.11	-.16	.38
Change in self-construal (T1-T2)	-1.45	2.61	-2.19	2.78	-2.00	.047	-.28	-.55	.00
Defensive reactions	7.32	1.52	7.43	1.65	.50	.620	.07	-.20	.34
Change in mood	-4.28	2.57	-4.14	3.01	.34	.734	.05	-.23	.32
Episodic envy T1	27.19	9.74	24.36	9.68	-2.11	.036	-.29	-.56	-.02
Rate of cooperation (PD)[a,b]	43.71	28.91	46.39	32.70	.34	.734	.09	-.19	.36
Earnings - Self[a]	108.02	48.99	113.24	55.65	.53	.596	.07	-.20	.35
Earnings - Opponent[a]	200.29	104.20	208.64	116.22	.35	.728	.05	-.22	.32
Episodic envy T2[a]	21.46	9.35	19.86	9.54	-1.30	.194	-.17	-.44	.10
Ultimatum decision[b,c]	85.44	35.45	75.96	42.94	-1.73	.085	-.24	-.51	.03
Schadenfreude[a]	22.63	5.15	21.04	5.38	-.95	.348	-.31	-.95	.34
Liking difference	.58	1.77	1.08	1.76	2.00	.047	.28	.00	.60
Intelligence difference[b]	-1.63	1.95	-1.70	2.48	-.23	.817	-.03	-.31	.24

[a] Indicates that scales were square-root transformed (however, *M* and *SD* reflect the untransformed scales).
[b] Indicates that Levene's test for homogeneity of variance had $p < .05$, and t-tests do not assume equal variances across groups. [c] This proportion has been presented as a percentage of participants in each condition who chose to accept the ultimatum offer.

Self-Affirmation Effects on Manifestations of Envy

Given the exploratory and pioneering nature of the present research, the general analytic strategy across hypothesis testing prioritized the avoidance of Type II errors (i.e., failing to detect true effects). Elsewhere, researchers have suggested that Type II errors may be costlier than Type I errors in exploratory research designs, in part because the latter can be minimized in confirmatory research (e.g., Jaeger & Halliday, 1998). In this vein, some of the reported results do not always satisfy conventional significance levels (p < .05). For sake of consistency and ease of readability, the term 'marginally significant' is used for cases in which $.05 \leq p < .1$.

Hypothesis 1: Self-affirmation will curb self-reported envy feelings.

Consistent with the first hypothesis, affirmed participants reported feeling significantly less envy toward the ostensibly smarter and financially advantaged student (referred to as "X" on the Episodic Envy Scale) in the adjacent room ($t = -2.11$, $p = .036$). Using conventional interpretations of the magnitude of Cohen's *d* statistic, self-affirmation exerted a small-to-medium sized effect on self-reported envy ($d = -.29$, 95% CI: -.56, -.02).

A follow-up means comparison of individual scale items indicated that affirmed participants reported significantly lower ratings than controls on the following items (all $ps < .05$): "I feel bitter; I feel envious [of X]; I feel gall [irritated, annoyed]" and marginally lower ratings on the item: "I feel some hatred toward X" ($p =$ .068). These results suggest that self-affirmation may have curbed aspects of envy related to other-directed hostility and negative affective reactions, while not affecting participants' acknowledgement of their rival's superior position ("X has things going better for him/her than I do;" ns) or their current lack of and desire for the advantage held by their rival ("I lack some of the things X has; I want to have what X has;" both ns).

Hypothesis 2: Self-affirmation will reduce behavioural manifestations of envy.

An independent mean comparison showed that affirmed participants were slightly more likely to cooperate across the 20-round Prisoner's Dilemma (46.39% vs. 43.71%), although this difference was not statistically significant ($t = .34$, $p = .734$, $d = .09$, 95% CI: -.19, .36). Consistent with results reported by Parks et al. (2002), participants generally became less cooperative as the game progressed,[20] with cooperation rates in both groups dropping after the first 5 rounds. No significant mean differences emerged across each of the four blocks.

Participants' decisions during the ultimatum game, as noted earlier, were heavily skewed overall in favour of accepting an unfair $2 offer from a $10 prize ostensibly offered by the opponent (81% accepted). An independent means comparison revealed that, contrary to hypothesis, affirmed participants were marginally less likely to accept the offer than controls (75.96% vs. 85.44% acceptance; $t = -1.73$, $p = .085$, $d = -.24$; 95% CI: -.51, .03).

Hypothesis 3: Self-affirmation will protect against envy at 1-month follow-up.

As hypothesized, affirmed participants were less envious when recalling their most intense past-month episode involving envy relative to controls, although the difference was not significant ($t = -.51$, $p = .609$, $d = -$.08, 95% CI: -.38, .22). Closer inspection of individual items revealed that affirmed participants were slightly

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[20] Based on the analytical strategy used by Parks et al. (2002), cooperation was examined in four five-round blocks. Affirmed participants cooperated in 55.96% / 45.00% / 42.31% / 42.31% of trials, whereas controls cooperated in 53.90% / 42.48% / 38.48% / 40.00% of trials. Affirmed participants were slightly more cooperative than controls in each block, although no mean comparisons approached statistical significance.

less upset than controls about the unfairness of their deprivation[21] and reported slightly greater admiration for

the target of their envy,[22] although both comparisons only approached statistical significance. Affirmed

participants reported greater use of two of the four recommended strategies recommended in the

psychoeducational handout, relative to controls. Specifically, affirmed participants reported significantly greater

use of perseverance and learning strategies, both of which were self-improvement-oriented and intended to

foster benign (vs. malicious) envy. No differences between groups emerged for either emotional control

strategy. Among participants who reported having used each of these strategies, affirmed participants rated

perseverance as significantly, and learning as marginally significantly, more helpful than did controls.

Examining participants' experience over the past month revealed no significant differences between groups with

regard to the number of reported envy experiences or envy-related hassles, contrary to hypotheses.

 Means comparisons involving Part 3 measures are presented in Table 9. Selected comparisons of interest

will be discussed under separate headings.

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[21] Self-affirmation: $M = .72$ ($SD = .73$), Control: $M = .89$ ($SD = .74$), $t = 1.48$, $p = .14$, $d = .23$, 95% CI: -.08, .53.

[22] This item was not included in the envy composite measure due to weak scale loadings. Including the admiration item enlarged the difference between group means in the hypothesized direction but did not approach statistical significance ($t = .84$, $p = .40$). The higher levels of admiration among affirmed participants (lower scores indicate greater admiration due to reverse-scoring) may signal the presence of benign envy, a relatively adaptive and non-malicious variant of envy (Lange & Crusius, 2015). Self-affirmation: $M = 1.13$ ($SD = .76$), Control: $M = 1.29$ ($SD = .68$), $t = 1.50$, $p = .13$, $d = .23$, 95% CI: -.07, .53.

Table 9

Means Comparisons Across Part 3 Study Variables

	Experimental condition				Means comparison		Effect Size	Confidence interval (95%)	
	Control		Self-affirmation						
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*	*Lower*	*Upper*
Envy composite	4.76	2.54	4.54	2.91	-.51	.609	-.08	-.38	.22
# Past-month envy	1.54	.98	1.46	.82	-.55	.581	-.09	-.39	.22
Use of Strategies:									
EC: Anger[b]	2.20	1.06	2.18	1.27	-.06	.951	-.01	-.31	.29
EC: Sad/Embarrassed	2.17	1.13	2.43	1.15	1.45	.149	.22	-.08	.53
Perseverance[b]	2.68	1.11	3.14	.99	2.95	.005	.45	.15	.76
Learning from others[a]	1.83	1.15	2.21	1.27	2.03	.004	.31	.01	.62
Helpfulness of Strategies:									
EC: Anger	2.31	1.03	2.45	1.04	.83	.410	.14	-.18	.46
EC: Sad/Embarrassed	2.22	1.13	2.35	1.21	.71	.480	.11	-.20	.43
Perseverance[b]	2.62	1.12	2.96	1.13	2.36	.020	.37	.06	.68
Learning from others[a]	2.01	1.12	2.34	1.20	1.68	.094	.28	-.05	.60
Hassles assessment scale									
Frequency[a]	94.57	34.30	101.19	33.37	1.38	.169	.21	-.09	.52
Unpleasantness[a]	76.35	33.57	78.32	32.41	.45	.653	.07	-.23	.37
Dwelled[a]	109.96	35.56	116.26	37.07	1.13	.261	.17	-.13	.48
Envy-related hassles	62.32	22.07	64.28	21.01	.59	.557	.09	-.21	.40

Note. EC = Emotional control.
[a] Indicates that scales were square-root transformed (however, *M* and *SD* reflect the untransformed scales).
[b] Indicates that Levene's test for homogeneity of variance had $p < .05$, and t-test reflects the "equal variances not assumed" option.

Intercorrelations Among Main Study Variables by Experimental Condition

Table 10 provides the intercorrelation matrix for the main study variables across all study phases, with

separate zero-order correlation coefficients listed across each experimental condition. This matrix, while not

assessing any study hypotheses, is included to display the relations across main study variables and provide

further information for the reader. Defensive reactions and all variables thereafter were completed after random

assignment of participants to experimental conditions, whereas all prior variables were assessed in Mass Testing

and Part 1 prior to random assignment.

Table 10

Intercorrelation Matrix for Main Study Variables by Experimental Condition

	Condition	IQ	SCS	GN	VN	RSE	PES	Trivialize	SC	Mood	EE	Coop	Ultim	EnvyT3	#Envy	ERH
Dispositional	Affirm	.15	-.44***	.19*	.50***	-.54***	.12	-.21*	-.11	-.12	.11	.01	-.08	.24*	.21^m	.43***
Envy	Control	.11	-.49***	.19*	.57***	-.53***	.13	-.36***	.08	-.05	.35***	.18^m	-.18^m	.31**	.38***	.58***
Importance	Affirm		-.20*	.22*	.29**	-.00	.09	-.05	.02	-.06	-.07	-.08	-.02	.08	.00	.22*
of Intelligence	Control		-.14	.16^m	.13	.03	-.00	-.08	-.13	.09	-.03	.07	-.09	.02	-.11	-.03
Self-Compassion	Affirm			-.17^m	-.48***	.66***	.09	.03	.16	.15	-.09	-.02	.02	-.02	-.20^m	-.32**
Scale	Control			-.16	-.65***	.75***	.04	.39***	.14	.11	-.35***	.04	-.10	-.25*	-.24*	-.39***
Grandiose	Affirm				.65***	-.22*	.57***	-.12	.02	-.08	.09	.12	-.12	.03	-.01	.27*
Narcissism	Control				.51***	-.00	.37***	-.28**	.09	-.05	.12	-.05	-.10	.10	.18	.11
Vulnerable	Affirm					-.52***	.43***	-.18^m	-.04	-.16^m	.24*	.08	-.07	.16	.08	.43***
Narcissism	Control					-.52***	.30**	-.44***	.03	-.13	.40***	-.04	-.21*	.38***	.31**	.47***
Self-Esteem	Affirm						.06	.20*	.20*	.11	-.18^m	-.16	.03	-.04	-.13	-.33**
	Control						.06	.36***	.14	.12	-.26**	-.00	-.06	-.13	-.14	-.33**
Psychological	Affirm							-.01	.09	-.02	.12	-.05	-.26**	.19^m	.18^m	.19^m
Entitlement	Control							-.05	.09	.12	.07	-.01	-.26**	.28*	.07	.18
Trivializing Reactions	Affirm								.17^m	.29**	-.49***	-.19	.01	-.17	-.10	-.11
	Control								-.04	.10	-.38***	.02	.10	-.32**	-.17	-.30**
Self-Construal	Affirm									-.02	-.06	.07	-.07	-.08	.00	.05
	Control									-.01	-.00	.10	.05	-.14	.05	.07
Mood	Affirm										-.36***	.01	-.06	-.17	-.22*	-.13
	Control										-.27**	-.05	-.01	-.07	-.04	-.24*
Episodic Envy	Affirm											-.02	-.12	.19^m	.06	.05
	Control											.05	-.11	.27*	.11	.30**
Cooperation	Affirm												.15	.02	-.14	.02
	Control												.11	-.12	.01	-.11
Ultimatum	Affirm													-.17	-.06	-.09
Choice	Control													-.12	.06	-.09
Envy	Affirm														.28*	.20^m
Composite (T3)	Control														.32**	.43***
# Past-Month	Affirm															.24*
Envy Experiences	Control															.49***

Note. DES = Dispositional Envy Scale; IQ = Importance of Intelligence; SCS = Self-Compassion Scale; GN = Grandiose Narcissism; VN = Vulnerable Narcissism; RSE = Self-Esteem; PES = Psychological Entitlement; SC = Residualized self-construal score (controlling for baseline); Trivialize = Trivialization of test feedback; Mood = Residualized mood score (controlling for baseline); EE = Episodic Envy Scale; N-C = Proportion of cooperative choices in Prisoner's Dilemma game; Ultim = Ultimatum Choice (0 = Reject, 1 = Accept); EnvyT3 = Envy Composite for Part 3 recall of most intense past-month envy experience; #Envy = Number of envy experiences in past month; ERH = Envy-related hassles. Varying *N*s across correlations.
*** $p<.001$; ** $p<.01$; * $p<.05$; ^{m} $p<.1$.

Moderation, Mediation, and Conditional Process Analyses

Next, hypothesized models assessing the potential impact of moderators and mediators of an affirmation-envy effect were examined for primary dependent variables. These dependent variables included self-reported episodic envy, a potential behavioural manifestation of envy (proportion of non-cooperation), as well as the degree to which participants experienced envy when recalling their most intense episode from the past month. These analyses assessed both for whom the self-affirmation was most effective, as well as the extent to which hypothesized mechanisms explained how self-affirmation worked.

Separate analyses were conducted for each of the three dependent variables. Potential moderators of self-affirmation effects were examined separately in simple moderation analyses to directly test study hypotheses. Subsequent exploratory analyses examined all possible combinations of two moderator pairs as, given the inclusion of several prospective moderators and novel research domain, more complex relationships may exist that could qualify simple effects and further specify personality characteristics that make one most likely to benefit from self-affirmation interventions. Following Hayes' (2013) recommendations, these analyses initially focused on three-way interactions involving both moderators and the experimental condition by running a serial moderation model. For analyses that produced non-significant three-way interactions, moderator pairs were examined in parallel (i.e., no three-way interaction).

In the next series of analyses, potential mediators of the experimental manipulation - residualized[23] self-construal and mood scores - were examined separately, as well as jointly in parallel and serial mediation models to test Hypothesis 5. Finally, conditional process analyses

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[23] Residualized scores regressed post-intervention levels of self-construal and mood on baseline standing on each respective measure, creating a purified measure of each mediator. MacKinnon, Kisbu-Sakarya, and Gottschall (2013) note that residualized change scores are commonly used in mediation models as an alternative to analysis of covariance or difference scores, with results that are often indistinguishable from the former as both control for baseline measurement.

were conducted to assess whether any mediation effects were moderated. All analyses included

mean-centered variables to simplify interpretation of the results and controlled for the extent to

which participants viewed intelligence as important to their self-concept by including this

variable as a covariate.[24] Participants' importance of intelligence ratings were controlled in order

to assess purer reactions to objective outperformance that were not confounded by the centrality

of the threat domain to students' identity.[25]

Hypothesis 4: Self-affirmation effects on envy will be moderated by other

personality variables.

Self-affirmation's impact on envy and envy-related dependent variables was hypothesized

to be moderated by several variables, producing a beneficial envy-reducing effect solely or

preferentially among individuals who have fewer psychological resources to cope with self-

integrity threats and/or perceive an upward comparison threat to be especially aversive. On this

basis, individuals with elevated dispositional envy and vulnerable and/or grandiose narcissistic

traits, and low self-esteem, were hypothesized to benefit most from self-affirmation as they

would be most at-risk to experience envy. Individuals with low self-compassion and/or high

entitlement were also hypothesized to experience a greater reduction in envy, although the

available research evidence to support these hypotheses was less developed than for the

previously mentioned moderators. Sex was also assessed as a potential moderator with no

specified hypothesis.

Separate models were examined for each potential moderator, including dispositional

envy, vulnerable and grandiose narcissism, self-esteem, self-compassion, entitlement and sex,

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[24] Three participants omitted the importance of intelligence measure during mass testing but were retained in the analysis, having provided complete data on other study measures. Hence, the mediation and moderation analyses generally involve $N = 206$ participants from the total sample of $N = 209$.
[25] Importance of intelligence was also assessed as a potential mediator and moderator of self-affirmation effects but did not produce any significant findings.

across each of the primary dependent variables, controlling for importance of intelligence. Johnson-Neyman significance region statistics (Johnson & Fay, 1950) were used to identify levels of the moderator variable at which the treatment and control groups diverged with respect to the dependent variable ($p < .05$). Interactions were also probed using a pick-a-point approach based on the 10th (Low), 25th (Low-Moderate), 50th (Moderate), 75th (Moderate-High), and 90th (High) percentile values of each moderator (qualitatively, referring to low, low-to-moderate, moderate, moderate-to-high, and high levels of each trait, respectively). This additional analytical strategy was used in order to provide a more nuanced interpretation of the interaction spanning a range of moderator values, as well as to detect regions of marginal significance that would not be identified in a conventional Johnson-Neyman analysis to aid interpretation of the findings.

Episodic envy.

As hypothesized, affirmed participants reported significantly less episodic envy than controls at higher (vs. lower) levels of dispositional envy (interaction term: $t = -1.97$, $p = .049$, $d = .28$, 95% CI: .00, .55). A single Johnson-Neyman (J-N) critical value for the moderator was identified ($M = .19$), above which affirmed participants reported significantly less episodic envy than controls. Put another way, these findings indicate that, among individuals with moderate or greater dispositional envy (greater than 0.19 points above the Dispositional Envy Scale mean score, or approximately the 56th percentile), participants assigned to the self-affirmation condition reported feeling significantly less envious overall toward an advantaged rival student than control participants. Individuals with dispositional envy scores below this value did not significantly differ across experimental conditions. This significant moderator effect for dispositional envy qualifies the earlier finding of a main effect of affirmation condition on

episodic envy (Hypothesis 1). Examining the simple conditional effects, higher dispositional

envy scores predicted stronger episodic envy ($t = 3.81$, $p = .000$, $d = .53$, 95% CI: .25, .81), while

affirming a core value predicted marginally lower episodic envy ($t = -1.92$, $p = .056$, $d = .27$,

95% CI: -.01, .54). See Table 11 and Figure 2 for a detailed output of the moderation analysis

and a scatterplot illustrating the interaction.

Table 11

Simple Moderation Analyses with Dispositional Envy Moderating the Effect of Experimental Condition on Episodic Envy

| Antecedent | Y (Episodic Envy) | | | |
	(Symbol)	Coeff	SE	p
X (Condition)	b_1	-2.55	1.33	.056
C (Importance IQ)	u_1	-.12	.16	.443
M (Dispositional envy)	b_2	.51	.13	.000
X x M	b_3	-.37	.19	.049
Constant	i_1	1.11	.94	.236

$R^2 = .09$, $F(4, 201) = 6.54$, $p = .000$
ΔR^2 due to interaction = .018

Note. X = Independent variable (experimental condition), M = Moderator (dispositional envy), X x M = Interaction term, C = Covariate (importance of intelligence), Y = Dependent variable (episodic envy).
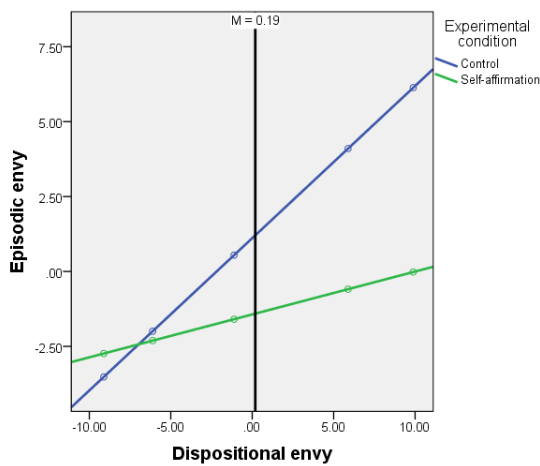
Figure 2. Scatterplot illustrating the effect of experimental condition on episodic envy at the 10th, 25th, 50th, 75th, and 90th percentile values of the moderator (dispositional envy). The analysis controlled for importance of intelligence. The significant J-N transition point is indicated with a vertical line. Variables were mean-centered prior to analysis.

Also consistent with the study hypothesis, the interaction of self-compassion and self-affirmation was marginally significant ($t = 1.74$, $p = .084$, $d = .24$, 95% CI: -.03, .52) and produced one significant J-N value (-1.13), indicating that individuals with low to moderate levels of self-compassion (1.13 points or more below the Self-Compassion Scale mean score, or approximately the 42nd percentile) experienced significantly less episodic envy in the affirmation (vs. control) condition. Individuals with self-compassion scores above this mark did not significantly differ across conditions (see Table 12 and Figure 3). This significant moderator effect for self-compassion qualifies the earlier finding of a main effect of affirmation condition on episodic envy (Hypothesis 1).Higher levels of self-compassion predicted lower episodic envy ($t = -3.69$, $p = .000$, $d = -.51$, 95% CI: -.79, .24), whereas self-affirming predicted marginally lower episodic envy ($t = -1.85$, $p = .066$, $d = -.26$, 95% CI: -.53, .02).

Table 12

Simple Moderation Analyses with Self-Compassion Moderating the Effect of Experimental Condition on Episodic Envy

Antecedent	Y (Episodic Envy)			
	(Symbol)	Coeff	SE	p
X (Condition)	b_1	-2.46	1.33	.066
C (Importance IQ)	u_1	-.14	.16	.390
M (Self-compassion)	b_2	-.22	.06	.000
X x M	b_3	.15	.09	.084
Constant	i_2	1.07	.94	.254

$R^2 = .09$, $F(4, 201) = 4.92$, $p = .001$
ΔR^2 due to interaction = .014

Note. X = Independent variable (experimental condition), M = Moderator (self-compassion), X x M = Interaction term, C = Covariate (importance of intelligence), Y = Dependent variable (episodic envy).
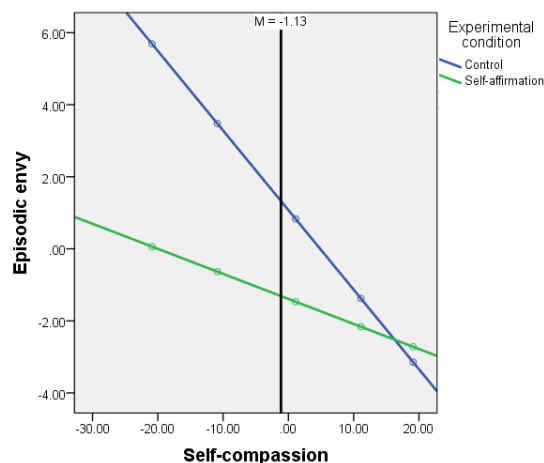
Figure 3. Scatterplot illustrating the effect of experimental condition on episodic envy at the 10th, 25th, 50th, 75th, and 90th percentile values of the moderator (self-compassion). The analysis controlled for importance of intelligence. The significant J-N transition point is indicated with a vertical line. Variables were mean-centered prior to analysis.

No other simple moderator analyses produced significant or near-significant ($p < .1$)

interaction terms.[26]

Next, moderation analyses involving pairs of moderators were examined, first in serial

(i.e., including a three-way interaction term) and then in parallel (i.e., with no three-way

interaction term). No analyses produced significant three-way interaction terms. Follow-up

parallel moderator analyses indicated that the two-way interactions of either dispositional envy

or self-compassion and experimental condition were significant or marginally significant across

several analyses, supporting the robustness of the simple moderator analyses even when

controlling for the effect of another potential moderator.[27]

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[26] The results of a simple moderator analysis examining vulnerable narcissism was in the hypothesized direction, although the interaction term was not significant ($t = -1.47$, $p = .143$, $\Delta R^2 = .009$, $d = -.20$, 95% CI: -.48, .07). The analysis produced a significant J-N value of 3.85 (corresponding to approximately the 50.5th percentile), indicating that participants with vulnerable envy scores above this mark reported significantly lower episodic envy in the self-affirmation (vs. control) condition.

[27] The two-way interaction of dispositional envy and experimental condition was significant when examined alongside entitlement as a moderator ($t = -1.99$, $p = .048$, $d = -.28$, 95% CI: -.55, .00) and near-significant when examined alongside grandiose narcissism ($t = -1.92$, $p = .056$, $d = -.26$, 95% CI: -.54, .01), and self-esteem ($t = -1.79$, $p = .074$, $d = -.25$, 95% CI: -.52, .02). The two-way interaction of self-compassion and experimental condition was marginally significant when examined alongside self-esteem ($t = 1.81$, $p = .072$, $d = .25$, 95% CI: -.02, .53), sex

Non-cooperation.

Simple moderation analyses separately examined each potential moderator of self-affirmation's effects on rate of cooperation across the 20-round Prisoner's Dilemma game and revealed that no interaction terms approached statistical significance. No significant J-N values were identified for any moderators. Subsequent examination of serial and parallel moderator analyses revealed no significant interactions.

Envy for recalled past-month episode.

As for non-cooperation, simple moderation analyses for each potential moderator of self-affirmation's effects on envy intensity when recalling their strongest past-month episode involving envy identified no interaction terms that approached statistical significance, although each of the two-way interaction terms were in the hypothesized direction. No significant J-N values were identified for any potential moderators.

When moderators were examined in pairs, only one analysis produced a significant three-way interaction term. When dispositional envy and vulnerable narcissism were examined jointly (shown in Table 13 and Figure 4), the interaction of both moderators with experimental condition produced a significant three-way interaction ($t = -2.40$, $p = .017$, $d = -.37$, 95% CI: -.67, -.06). Probing the interaction revealed that affirmed participants were generally more envious than controls at higher levels of dispositional envy, although this was contingent upon an individual's level of vulnerable narcissism. Among those with low or low-to-moderate levels of vulnerable narcissism, affirmed participants reported slightly lower envy than controls at low levels of dispositional envy, but reported stronger envy at higher levels of dispositional envy. At the highest levels of vulnerable narcissism this pattern was reversed. Two J-N values indicated

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($t = 1.79$, $p = .075$, $d = .25$, 95% CI: -.03, .52), grandiose narcissism ($t = 1.70$, $p = .090$, $d = .24$, 95% CI: -.04, .51), and entitlement ($t = 1.67$, $p = .096$, $d = .23$, 95% CI: -.04, .51).

that the interaction of dispositional envy and experimental condition was significant at

vulnerable narcissism levels below -19.86 and above 57.05 (mean-centered; approximately the

24th and 99th percentiles, respectively). No two-way interactions were statistically significant,

although vulnerable narcissism exerted a conditional direct effect with higher levels generally

predicting stronger envy ($t = 2.00$, $p = .047$, $d = .31$, 95% CI: .00, .61). These findings suggest

that affirmation may have intensified the experience of envy among envy-prone individuals with

low vulnerable narcissistic traits, contrary to the study hypothesis, but offered some protection

for those with the most prominent levels of vulnerable narcissism.[28]

Table 13

Serial Moderation Analyses with Dispositional Envy and Vulnerable Narcissism Moderating the Effect of Experimental Condition on Episodic Envy

Antecedent	Y (Past-month envy intensity)			
	(Symbol)	Coeff	SE	p
X (Condition)	b_1	.50	.48	.303
M (Dispositional envy)	b_2	.02	.06	.697
W (Vulnerable narcissism)	b_3	.04	.02	.047
X x M	b_4	.07	.07	.319
X x W	b_5	-.03	.02	.162
M x W	b_6	.00	.00	.201
X x M x W	b_7	-.01	.00	.017
C (Importance IQ)	u_1	-.02	.05	.713
Constant	i_1	-.25	.36	.497

$R^2 = .14$, $F(8, 158) = 3.17$, $p=.002$
ΔR^2 due to interaction $= .031$

Note. X = Independent variable (experimental condition), M = Moderator 1 (dispositional envy), W = Moderator 2 (vulnerable narcissism), C = Covariate (importance of intelligence), Y = Dependent variable (episodic envy).

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[28] Of note, a moderator analysis involving dispositional envy and grandiose narcissism produced a marginally significant three-way interaction term ($t = 1.90$, $p = .059$, $d = -.29$, 95% CI: -.60, .01) and displayed a similar pattern of findings as this analysis: participants with low grandiose narcissism traits were more envious in the affirmation condition at high levels of dispositional envy, but less envious at low levels; the opposite pattern was evident at high levels of grandiose narcissism. However, the analysis was considerably less robust as the two-way interaction of dispositional envy and experimental condition was not significant or marginally significant ($p < .1$) across any levels of grandiose narcissism. Consequently, the analysis is not discussed in-text.
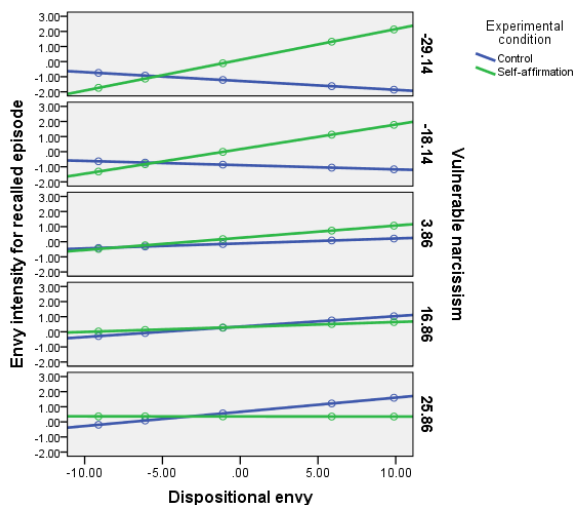
Figure 4. Scatterplot illustrating the interaction of experimental condition and dispositional envy at 10th, 25th, 50th, 75th, and 90th percentile values of the moderator (vulnerable narcissism). The analysis controlled for importance of intelligence. Variables were mean-centered prior to analysis.

In summary, the aforementioned moderator analyses provided some evidence for moderated treatment effects. While the self-affirmation intervention reduced self-reported episodic envy overall, it was particularly helpful for individuals with elevated dispositional envy and low trait self-compassion. However, the null findings with regard to affirmation effects on rate of cooperation and envy intensity for a recalled past-month episode were largely insensitive to dispositional moderators, with the exception of the three-way interaction noted earlier.

Hypothesis 5: Self-affirmation effects will be mediated by self-construal and/or mood.

Simple mediation models were examined with residualized self-construal and mood scores examined separately as mediators of the effect of experimental condition (self-affirmation = 1, control = 0) on each respective dependent variable, controlling for importance of intelligence.[29] Higher self-construal ratings (indicating a more abstract self-construal) were hypothesized to mediate any envy-reducing effects of the self-affirmation intervention. Mood

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[29] Residualized scores were obtained by regressing participants' self-construal or mood ratings in Part 2 on their baseline standing on each measure.

was included as a plausible alternative mediator based on limited support in prior studies

(McQueen & Klein, 2006) as well as to test whether self-affirmation's impact on envy goes

beyond simply attenuating negative emotional reactions.

Episodic envy.

A simple mediation analysis revealed that changes in self-construal had no indirect effect

in influencing how self-affirmation affected episodic envy (see Table 14 and Figure 5). A bias-

corrected 95% bootstrap confidence interval for the indirect effect ($ab = .07$ [.19]) based on

10,000 bootstrap samples[30] did not support claims of mediation as it included zero (-.21, .60).

Writing the self-affirmation essay predicted marginally more concrete self-construal relative to

controls ($a = -.60$, $p = .095$, $d = -.23$, 95% CI: -.51, .04), contrary to the hypothesis that

affirmation would promote a more abstract self-construal, and predicted a significant decrease in

episodic envy relative to controls ($c' = -2.96$, $p = .033$, $d = -.30$, 95% CI: -.57, -.02). However,

self-construal had no meaningful impact on self-reported episodic envy ($b = -.11$, ns).

Table 14

Simple Mediation Analysis Assessing Self-Construal as Mediating the Effect of Experimental Condition on Episodic Envy

	Consequent							
	M1 (Self-construal)				Y (Episodic envy)			
Antecedent	(Symbol)	Coeff	SE	p	(Symbol)	Coeff	SE	p
X (Condition)	A	-.60	.36	.095	c'	-2.96	1.38	.033
M1 (Self-construal)	-	-	-	-	b	-.11	.27	.669
C (Importance IQ)	f_1	-.03	.04	.477	g_1	-.06	.17	.723
Constant	i_1	.29	.25	.259	i_2	1.41	.97	.147
	$R^2 = .02$, $F(2, 203) = 1.77$, $p = .173$				$R^2 = .024$, $F(3, 202) = 1.63$, $p = .184$			

Note. X = Independent variable (experimental condition), M1 = Mediator (self-construal), C = Covariate (importance of intelligence), Y = Dependent variable (episodic envy).

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[30] Note: To avoid unnecessary duplication of information or confusion on part of the reader, any further references to estimates of indirect effects similarly involve bias-corrected 95% confidence intervals based on 10,000 bootstrap samples.
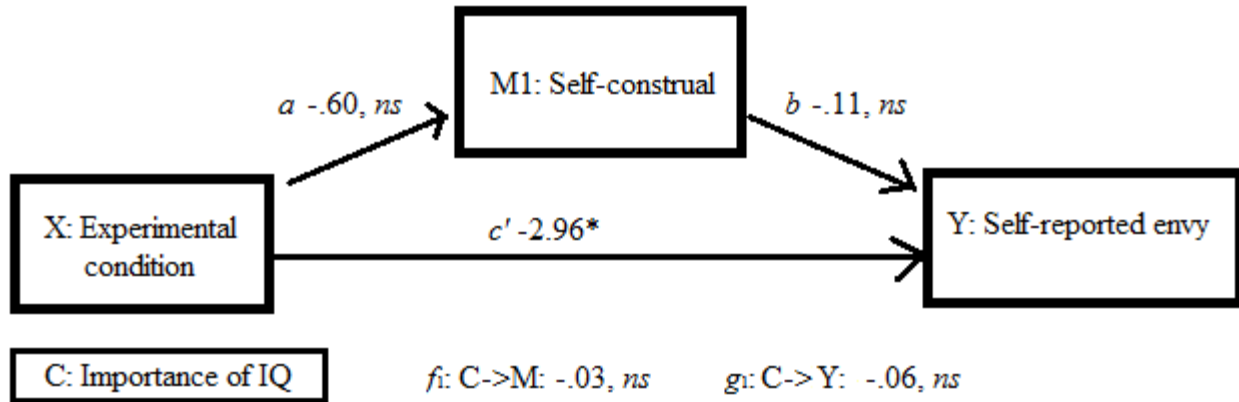
Figure 5. Simple mediation model examining residualized self-construal scores (M1) as mediating the effect of experimental condition (X; Affirmation = 1, Control = 0) on self-reported envy (Y). The analysis controlled for importance of intelligence (C).

Note. All beta coefficients are unstandardized. * $p < .05$

A simple mediation analysis similarly revealed that changes in mood had no indirect effect in influencing how self-affirmation affected episodic envy (see Table 15 and Figure 6). The estimate of the indirect effect ($ab = -.56$ [.43]) approached statistical significance, but the confidence interval included zero (-1.50, .21), indicating no significant mediation effect. Self-affirming during the writing exercise did not significantly affect participants' mood ($a = .44$, *ns*), although it predicted marginally lower episodic envy ($c' = -2.32$, $p = .077$, $d = -.25$, 95% CI: -.52, .03). Mood was a strong negative predictor of episodic envy ($b = -1.27$, $p = .000$, $d = -.65$, 95% CI: -.93, -.37).

Table 15

Simple Mediation Analysis Assessing Mood (M) as Mediating the Effect of Experimental Condition (X) on Episodic Envy (Y)

Antecedent		Consequent						
	M2 (Mood [- = worse])				Y (Episodic envy)			
	(Symbol)	Coeff	SE	p	(Symbol)	Coeff	SE	p
X (Condition)	a	.44	.33	.187	c'	-2.32	1.31	.077
M2 (Mood)	-	-	-	-	b	-1.27	.27	.000
C (Imp. IQ)	f_1	.01	.04	.795	g_1	-.04	.16	.790
Constant	i_1	-.20	.24	.391	i_2	1.12	.92	.225
	$R^2=.01$, $F(2, 203) = .94$, $p=.392$				$R^2=.12$, $F(3, 202) = 8.95$, $p=.000$			

Note. X = Independent variable (experimental condition), M2 = Mediator (mood), C = Covariate (importance of intelligence), Y = Dependent variable (episodic envy).
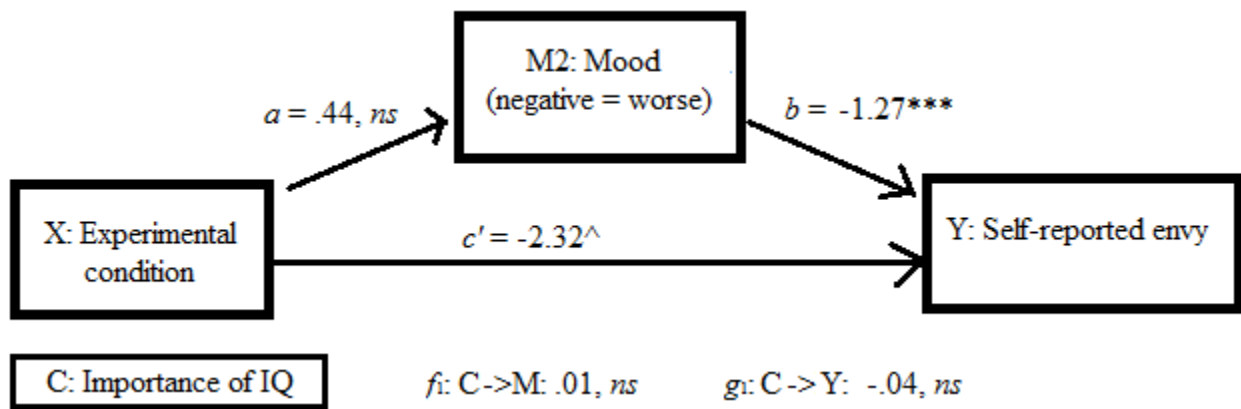
Figure 6. Simple mediation models separately examining residualized self-construal (M1) and mood (M2) scores as mediating the effect of experimental condition (X; Affirmation = 1, Control = 0) on self-reported envy (Y). The analysis controlled for importance of intelligence (C).

Note. All beta coefficients are unstandardized. ^ $p<.1$; * $p<.05$; ** $p<.01$; ***$p<.001$.

A parallel mediator model was also examined (not shown) that included both mediators; however, both the total indirect effect and specific indirect effects for each of the two mediators had confidence intervals that included zero and did not approach statistical significance.

Non-cooperation.

A simple mediation analysis revealed that changes in self-construal had no indirect effect in influencing how self-affirmation affected cooperation (ab = -.05 [.06], 95% CI: -.25, .02).

Cooperation was not predicted by either self-construal or experimental condition (b = .08, *ns*; c' = .16, *ns*).

Similarly, a simple mediation analysis indicated that mood had no indirect effect in influencing how self-affirmation affected cooperation (ab = -.01 [.05], 95% CI: -.16, .05). Cooperation was not predicted by either experimental condition (c' = .12, *ns*) or mood (b = -.03, *ns*).

A parallel mediator model including both mediators contained no significant predictors and produced non-significant total and specific indirect effects and specific indirect effects for each of the two mediators.

Envy for recalled past-month episode.

A simple mediation analysis revealed that self-construal had no indirect effect in influencing how self-affirmation affected envy for a past-month recalled envy episode (ab = .07 [.08], 95% CI: (-.02, .33). Neither experimental condition nor self-construal predicted intensity of envy for the recalled episode (c' = -.30, *ns*; b = -.11, *ns*).

Similarly, a simple mediation analysis indicated that mood had no indirect effect in influencing how self-affirmation affected envy for a past-month recalled envy episode (ab = -.06 [.07], 95% CI: -.28, .03). Envy intensity was not predicted by either experimental condition (c' = -.17, *ns*) or mood, although the latter approached marginal statistical significance (b = -.13, p = .131, d = -.23, 95% CI: -.54, .07).

A parallel mediator model including both mediators (not shown) contained no significant predictors and produced non-significant total and specific indirect effects and specific indirect effects for each of the two mediators.

Across each of the three analyses, neither self-construal nor mood accounted for the effects of self-affirmation on manifestations of envy. As self-affirmation was successful in significantly reducing self-reported envy toward an advantaged rival, the lack of evidence to support either mediator leaves unanswered the question of the mechanism(s) by which self-affirmation may help assuage at least some manifestations of envy.

Conditional process analyses: simultaneously examining moderators and mediators.

Although self-construal and mood did not mediate the affirmation-episodic envy linkage in a simple mediation model, conditional process models were examined to determine whether the nature of the mediation may be conditional upon certain levels of a particular moderator (see Figure 1 for a visual depiction)[31]. Distinct analyses were conducted for self-construal and mood that separately included each potential moderator and dependent variable (2 mediators x 7 moderators x 3 dependent variables = 42 total analyses) and provided bootstrap confidence intervals of the index of moderated mediation, as well as planned contrasts conducted at the 10th, 25th, 50th, 75th, and 90th percentile values of each moderator.

The analyses yielded non-significant bootstrap confidence intervals of the index of moderated mediation that included zero for each of the analyses, including those examining episodic envy, non-cooperation, and envy intensity for a recalled episode were examined as dependent variables. None of the planned percentile-based contrasts were statistically significant.

The collective results indicate that self-construal and mood do not account for self-affirmation's effects on envy. The results do not support Hypothesis 5 and suggest that self-affirmation may impact envy, particularly self-reported episodic envy, via some alternate, unmeasured mechanism(s).

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[31] The tested model corresponds to Model 8 in Hayes' (2012) PROCESS macro for SPSS.

Discussion

Coping with envy is a difficult prospect at the best of times. Yet daily life is full of unflattering social comparisons that threaten to undermine self-adequacy, particularly when they occur in highly important, self-relevant domains and involve others who are similar to ourselves in most respects (Tesser & Collins, 1988). Despite envy's painful and ubiquitous nature, no known published study to date had examined the efficacy of a brief intervention aimed at reducing envy, much less examined potential moderators or mediators of treatment effects. In addition, self-affirmation theory does not appear to have been discussed alongside or applied to the problem of envy. Consequently, the present study was novel in several important respects and also served to bridge two conceptually related fields of research involving envy and self-affirmation.

The present study was carefully designed to elicit the necessary aspects of envy by exposing undergraduate student participants to a highly threatening upward social comparison in the area of intelligence and academic performance. Eliciting envy is no easy task - it is a challenging emotion to manipulate and study due to both its socially undesirable quality that necessitates covert assessment, and its complex blend involving the desire for an advantage held by another coupled with feelings of personal inferiority, hostile ill will, and resentment regarding one's (subjectively) unfair situation (Smith et al., 1999; Smith & Kim, 2007).

Inferiority feelings were evoked via objective (though bogus) feedback that a fellow student had outperformed participants on an intelligence test ostensibly predictive of future academic success. Furthermore, each student learned that (s)he would soon compete at a considerable disadvantage against this student to potentially earn monetary payouts on the basis of one's inferior test scores. Although hostile feelings were not specifically targeted, they may be

a natural consequence of a threatening social comparison in a self-relevant domain; indeed, students were made acutely aware of their opponent's superior score and advantage in the upcoming game, while the competitive nature of the mutual decision game was emphasized. In addition, the rationale for students' disadvantage in the mutual decision game (lower intelligence test score) was intended to produce subjective injustice perceptions that typically characterize envy (Smith & Kim, 2007).[32] By all accounts, these study aspects contributed to a successful induction of envy reactions among the vast majority of student participants and provided an ideal controlled environment to assess whether self-affirming produced beneficial short- and/or long-term effects on envy, as well as moderating personality traits and mediating mechanisms of its effects.

Review of Main Findings

Self-affirmation curbed envy feelings.

Indirectly responding to the self-integrity threat via self-affirmation of an unrelated domain was successful in bolstering students against envy toward an advantaged rival student. While short written reflections on the importance of a parent's ongoing emotional support or one's passion for hockey, to provide two examples, have no overt connection to academics, undertaking this reflection appeared to have shored up participants' perceptions of personal adequacy and attenuated envy reactions toward a "smarter" student who had succeeded where one had failed. Importantly, this effect operated with a degree of specificity, reducing the intensity of self-reported envy while not significantly impacting other aspects of negative mood. In addition, self-affirmation appeared to selectively target envy items that tapped into invidious

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[32] The nature of students' disadvantage, being somewhat justifiable on the basis of their inferior test score (but without prior knowledge of this standard), is likely to produce private perceptions of injustice but unlikely to produce public complaints as such. As Smith and Kim (2007) note, objective unfairness would be more likely to produce righteous indignation than envy, such as if participants were awarded an advantage based on the position of their last name in the alphabet.

emotional reactions (e.g., hostility, resentment) to an unflattering comparison - items within a scale factor (Feeling) elsewhere viewed as thoroughly maladaptive and has been linked to other negative emotional reactions and behavioural reactions intended to harm others (Cohen-Charash, 2009). In contrast, self-affirmation did not impact cognitive appraisals as affirmed participants acknowledged their disadvantage and longing for the advantage possessed by a rival student. This pattern of results may suggest that affirmed participants realistically acknowledged an unflattering comparison while experiencing the self-integrity threat as less emotionally intense. The small-to-medium magnitude of the effect size ($d = .29$) for the affirmation manipulation is also in line with effect sizes for self-affirmation interventions involving health behaviour outcomes reported in recent meta-analyses (Epton, Harris, Kane, von Koningsbruggen, & Sheeran, 2015; Sweeney & Moyer, 2015), suggesting the intervention may be comparably effective when applied to problems in the social arena.

The success of the self-affirmation writing intervention in reducing self-reported envy feelings in the laboratory suggests a promising new avenue for self-affirmation theory and research. These findings are both consistent with and meaningfully extend the limited existing research examining self-affirmation's beneficial effects on coping with actual or potential failure experiences. Specifically, prior research has reported that self-affirmation may reduce concerns about the potential consequences of failure on an important academic exam (Sherman, Bunyan, et al., 2009), while also reducing tendencies to ruminate following failure (Koole et al., 1999) or make downward comparisons to restore self-integrity (Spencer, Fein, & Lomore, 2001). Taken together, these results support Sherman's (2013) assertion that self-affirmation decouples evaluations of threat from self-evaluation and reduce their impact on the self, and reveals that this decoupling effect may also extend to the painful and socially toxic emotion of envy.

Self-affirmation was most effective among those most psychologically vulnerable.

As hypothesized, self-affirmations were also found to be most beneficial for individuals who were most psychologically vulnerable to the self-integrity threat. Students who generally experienced more frequent and intense episodes of envy and exhibited tendencies toward self-judgment and self-criticism in face of failure (i.e., had low self-compassion) experienced a stronger benefit from the self-affirmation intervention. These findings articulate two key personality traits that may be used to screen and identify individuals most likely to benefit from self-affirmation. Moreover, these findings reinforce an emerging consensus that self-affirmation does not bestow equivalent benefits for all, but instead preferentially - or, in some cases, solely - aids those individuals most at-risk to a particular self-integrity threat (e.g., Fielden, Sillence, Little, & Harris, 2016; Jaremka et al., 2011; Sherman, Bunyan, et al., 2009; Sherman et al., 2013).

Discussion of Null Findings

While self-affirmation was successful in attenuating self-reported envy in the laboratory, the null findings with respect to cooperation and envy intensity for a recalled past-month episode suggest some important boundary conditions on self-affirmation effects. Self-affirmation did not promote greater cooperation - a behavioural proxy for less envy - nor did it reduce the intensity of envy experienced when recalling one's most prominent past-month episode of envy. In addition, the proposed mechanisms hypothesized to mediate self-affirmation effects on envy were not supported. Discussion of each of these points will follow in turn.

Why did self-affirmation fail to promote cooperation?

Self-affirmation was anticipated to promote greater cooperation with an advantaged rival (relative to controls) in light of its beneficial effects in the research literature, such as reducing

aggressive behaviour (Thomaes et al., 2009) and fostering prosocial emotions (Thomaes et al.,

2012). However, self-affirmation failed to influence participants' rate of cooperation, a puzzling

finding that could reflect a variety of factors. One possibility is that students' feelings of envy

and/or the benefits of self-affirmation may have been relatively transient. Episodic envy was

assessed both following the failure feedback on the intelligence test and awareness of one's

upcoming disadvantage in the mutual decision game, as well as following the final round of the

Prisoner's Dilemma scenario. Although affirmed participants reported feeling significantly less

envious than controls at the first measurement, episodic envy scores markedly decreased within

both groups by the time episodic envy was re-assessed and, while affirmed participants again

reported lower episodic envy than controls, the independent means comparison was no longer

statistically significant.[33] The erosion of episodic envy scores suggests that the Prisoner's

Dilemma scenario may have been less envy-inducing than the failure feedback on the

intelligence test, although still sufficient to produce some degree of envy in the vast majority of

participants. Alternatively, envy scores may have been reduced by repeated measurement or

intervening behaviour (e.g., decision-making), which may erase internal state differences across

conditions (cf., Quattrone, 1985). The significant negative correlations between initial episodic

envy and mood throughout the Prisoner's Dilemma game also suggest some degree of envy is

present, although the intensity of participants' episodic envy was unrelated to their decision-

making throughout the game.

       Another possibility is that envy - a complex and multifaceted emotion - may promote

competing behavioural motives. As Wobker and Kenning (2013) observed, certain aspects of

envy may diverge with respect to their relations to subsequent destructive interpersonal

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[33] Episodic envy after IQ test: Control $M = 27.19$ ($SD = 0.74$), Self-affirmation $M = 24.36$ ($SD = 9.68$), $t = 2.11$, $p = .036$. Episodic envy after 20-round PD game: Control $M = 21.46$ ($SD = 9.35$), Self-affirmation $M = 19.86$ ($SD = 9.54$), $t = 1.30$, $p = .194$.

behaviours. Specifically, they reported that persistence of envy feelings and desire for another's held advantage predicted less, and perceptions that another's advantage was undeserved and inferiority feelings predicted more, destructive behaviours. A supplementary analysis in the present study, however, found that cooperation was unrelated to each of the episodic envy items in the total sample and control condition, although stronger feelings of gall and bitterness were associated with lower cooperation among affirmed participants (both ps $<.05$). That envy and its constituent parts (e.g,. hostility, interiority) were generally unrelated to cooperation raises the possibility that cooperation may be a poor behavioural representation of envy.

An important consideration involving any behavioural indicator of envy is that an aggressive or uncooperative action may be influenced by a variety of factors. Envy may serve as a motivational spark for an aggressive act, although it need not be the only (or even one) precipitant. This disconnect between priming motivations and measuring actions may help to account for the null linkage between envy and non-cooperation in the present study.

Also surprising is the finding that affirmed participants were marginally less likely to accept their opponent's ultimatum offer, contrary to the study hypothesis. Accepting a paltry offer of $2 (from $10), though considerably unfair, is an economically rational decision that bestows a small financial advantage, whereas rejecting the offer deprives one of this benefit. The fact that one's opponent receives a larger payout in this or similar zero-sum games should not matter, if not for envy (cf. Parks et al., 2002). A recent article by Gu and colleagues (2016) suggests this result may be reliable, reporting that self-affirmed participants rejected imbalanced (8:2 or 9:1 ratios) ultimatum offers at higher rates than controls, although both groups virtually always accepted fair offers. However, these authors contend that rejecting an unfair offer is an adaptive response that enforces a fair social norm at personal financial cost (i.e., altruistic

fairness), and that this decision requires greater psychological resources in order to tolerate the negative effects of rejecting another participant's offer. Further exploration into participants' motives in similar imbalanced ultimatum games may be necessary to determine whether rejection decisions are driven by adaptive, altruistic motives or maladaptive, envious ones.

Why did self-affirmation not protect against envy feelings at one-month follow-up?

Self-affirmation did not appear to offer any protection against envy feelings when participants were asked to recall their most intense episode, or total number of envy-related episodes, over the past month. These findings run contrary to those reported elsewhere documenting durable self-affirmation effects over time most commonly lasting for up to one week (e.g., Cooke, Trebaczyk, Harris, & Wright, 2014; Thomaes et al., 2009) up to periods lasting one month or more (Armitage, Harris, & Arden, 2011; Logel & Cohen, 2012), and to as long as three years (Sherman et al., 2013).

Cohen and Sherman (2014) offer three inter-related explanations for the persistence of self-affirmation effects over time: recursion, interaction, and subjective construal. As they note, positive outcomes flowing from self-affirmation may, in turn, perpetuate additional positive outcomes through a recursive processes, as well as interact with other aspects of the environment to enhance outcomes or create additional opportunities. In addition, Cohen and Sherman (2014) suggest that self-affirmation may trigger a shift in how individuals construe, filter and narrate events in their lives, strengthening a narrative of personal adequacy and enhancing coping with adversity.

Envy is particularly challenging to cope with because it can be aroused quickly, without apparent warning, and can occur across myriad situations and domains (Smith & Kim, 2007). For individuals with a chronic propensity to experience frequent and intense envy, the social

comparison landscape may be dotted with potential landmines to be triggered at the slightest

provocation. Smith and colleagues (1999) suggest that envy reactions may accumulate over time

and accentuate feelings of inferiority and ill will resulting from upward comparisons, prompt

vigilance to potential upward comparison threats, and even impede adaptive coping. These

factors would appear to create a negative recursive cycle fuelling dispositional envy over time.

Consequently, it is conceivable that a self-affirmation intervention might need to be bolstered

and/or supplemented with specific coping strategies in order to interrupt prototypical responses

to envy and initiate a positive recursive cycle of the kind discussed by Cohen and Sherman

(2014).

One silver lining is that self-affirmation appeared to promote greater use of perseverance

and learning strategies, as well as perceptions that these strategies are more helpful, relative to

controls. These strategies are consistent with a leveling-up motive focused on improving one's

position and outcomes that is characteristic of benign envy (van de Ven et al., 2009). This result

builds on the finding of Spencer et al. (2001) that affirmed participants preferred to make upward

(vs. downward) comparisons following self-integrity threat, suggestive of a self-improvement

(vs. self-protection) motive, while controls displayed the opposite preference. Affirmed

participants may not only prefer comparisons that foster self-improvement in the laboratory, but

may actively try to make these comparisons in daily life when encouraged to do so. Notably,

affirmed participants found these strategies to be more helpful than did controls, despite each

group reporting similar number of past-month envy-inducing situations and comparable intensity

envy feelings when recalling a particular instance. Although speculative, this discrepancy may

suggest that self-affirmation may not necessarily alter participants' perceptions of events (e.g.,

how many times one experienced envy), but may colour their subsequent interpretations of these past events (e.g., how one tried to cope with envy and the effectiveness of this effort).

Additionally, affirmed participants' greater use and perceived helpfulness of self-improvement motivated strategies are partially in line with results obtained by O'Brien (2016). She found that affirmed socially anxious individuals reported greater willingness than controls to approach threatening social situations and were less fearful and avoidant of these settings at one-month follow-up. As in the present study, all participants were given a short justification for engaging in alternative behaviours and encouraged to do so in their daily lives. Although self-affirmation did not produce tangible reductions in envy at one-month follow-up relative to controls, in contrast to O'Brien's (2016) findings that affirmed participants were less distressed when engaging in social behaviours, participants' greater use of strategies that may promote self-improvement over time in the present study suggests some potential for self-affirmation to promote adaptive reactions to threatening emotional states and improve coping in daily life.

How do self-affirmation interventions work?

A final question addressed by the present study concerned the mechanism(s) by which self-affirmation works and how it might reduce envy. Self-affirmation was hypothesized to help individuals broaden their self-construal beyond an immediate threat, thereby reducing its impact on self-integrity (c.f. Cohen & Sherman, 2014). This relatively abstract self-construal, relative to a more concrete self-construal for unaffirmed participants, was hypothesized to mediate self-affirmation's effects in curbing feelings and behavioural manifestations of envy. However, participants in both conditions - and affirmed participants in particular - became more concrete over time, although self-construal did not mediate self-affirmation effects. Participants' mood, likewise, did not account for self-affirmation effects. As a result, the mechanism(s) to explain

why self-affirmation curbed envy in the laboratory - and was most helpful for participants who were most psychologically vulnerable to envy - remain unexplained.

One possible explanation concerns the meaning and measurement of self-construal. Self-affirmation has been shown to promote high-level construal orientation in prior research, suggested in part by affirmed individuals' general preference for abstract, superordinate end-states vs. concrete, subordinate means-states (e.g., Schmeichel & Vohs, 2009; Sherman et al., 2013; Wakslak & Trope, 2009) when characterizing an array of common tasks on the Behavior Identification Form (BIF; Vallacher & Wegner, 1989) or variants thereof. A careful reader may wonder, though, why self-affirmation might influence such mundane tasks such as brushing one's teeth or mowing the lawn by promoting descriptions focused on their end-states (e.g., preventing dental decay; keeping the yard neat) over their mean-states (e.g., moving a brush against one's teeth; cutting the grass), and why these explanations should be linked to processing important self-threats. As Critcher and Dunning (2015) note, this explanation suggests that self-affirmation causes individuals to view all stimuli in abstract terms. Although the present study found that participants' construal of these and other common tasks did not mediate self-affirmation effects on envy, these findings do not preclude the possibility that self-affirmation's influence may have been more constrained to participants' perceptions of self-threat. Indeed, affirmed participants may well have viewed the threat of failure and outperformance on a diagnostic intelligence test as less menacing and consequential (in the bigger picture), relative to controls, while not exhibiting a preference for abstract task construals.

The premise that self-affirmations broaden perspective and constrict the impact of threats on the self has received support in the research literature. Critcher and Dunning (2015) provide compelling evidence that self-affirmations offer individuals perspective, broadening their

working self-concepts beyond a narrow threat to be more closely aligned with global self-views. Moreover, this broadened perspective mediated self-affirmation's effect of reducing defensiveness to threatening personality feedback. This explanation is in line with Cohen and Sherman's (2014) explanation that self-affirmation makes salient psychological resources beyond a given threat, reducing the threat's potency and fostering adaptive responses to threat.

Distilling this higher-order explanation of self-affirmation effects down to a single mediator may prove impossible. Prior research has identified several potential mediators of self-affirmation effect, none of which have been consistently observed (McQueen & Klein, 2006; Sherman & Cohen, 2006). In addition, Sherman (2013) has suggested that self-affirmation interventions may be subject to mediational heterogeneity, where different mediators of self-affirmation effects may emerge across different problem domains and individuals, leading to inconsistent results. Envy may be no exception, as self-affirmation might plausibly increase self-resources and/or attenuate aggression among psychologically vulnerable individuals, but broaden the perspective of other, less susceptible individuals (e.g., Sherman, 2013). As a result, including potential mediator variables in studies assessing self-affirmation's impact on envy remains an important consideration to determine how this intervention helps individuals cope with this emotion, while acknowledging that this mechanism may not necessarily be in effect for other self-integrity threats.

Challenges to Behaviour Change

Researchers have occasionally remarked on the failure of self-affirmation to produce behavioural change, despite its success in changing behavioural intentions or attitudes (e.g., Harris et al., 2014; McQueen & Klein, 2006). This pattern is surprising considering that intentions are often viewed as a preliminary step en route to behavioural change (e.g., Ajzen, 1991). While a recent meta-analysis by Sweeney and Moyer (2015) demonstrated that self-affirmation has produced small, though significant effect sizes on both intentions and behaviour, they noted that the effect size for intentions did not significantly predict the effect size for behaviour effects. Moreover, they also compared the two most commonly used self-affirmation manipulations: the values essay self-affirmation intervention (used in the present study) and an alternative kindness-based intervention involving recalling and describing past acts of kindness (Reed & Aspinwall, 1998). Although Sweeney and Moyer (2015) reported that the effect of type of manipulation did not moderate self-affirmation effects on intentions or behaviour, they observed that only the values essay produced a significant small effect size on intentions,[34] while only the kindness manipulation produced a significant small-to-medium effect size on behaviour.[35] Taken together, this apparent mismatch between attitudinal/cognitive and behavioural changes resulting from self-affirmation manipulation may help to explain why the intervention reduced participants' feelings of envy but did not affect the extent to which they cooperated with their envied rival.

It is worth noting that the majority of studies assessing behavioural changes resulting from self-affirmation interventions have involved health behaviour outcomes, such as decreasing alcohol consumption (Armitage et al., 2011) and over-eating (Logel & Cohen, 2012), as well as

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[34] Intentions: Values essay $d = .32$, 95% CI = .01, .63, $p = .05$. Kindness $d = .19$, 95% CI = -.16, .53, $p = .29$.
[35] Behaviour: Values essay $d = .17$, 95% CI = -.06, .40, $p = .16$. Kindness $d = .35$, 95% CI = .14, .56, $p < .01$.

promoting greater physical activity (Cooke et al., 2014) and fruit and vegetable consumption

(Harris et al., 2014), among others. As a result, extant meta-analyses focus on health-behaviour

change (Epton et al., 2015; Sweeney & Moyer, 2015), so it is unknown how generalizable these

patterns of findings are to envy and related phenomena (e.g., increasing prosocial behaviours:

Lindsay & Creswell, 2014; Thomaes et al., 2012).

A related (although untested) possibility is that self-affirmation effects may vary for

individuals across different stages of change (Ehret, LaBrie, Santerre, & Sherman, 2015). As

these authors imply, self-affirmation interventions among pre-contemplative individuals who

have not considered making behavioural changes and are likely to resist efforts to initiate

changes may reduce resistance and increase intentions to change behaviour - but perhaps fall

short of producing behavioural change. For other individuals further along the readiness to

change continuum, however, self-affirmation may help to initiate meaningful behavioural

change.

These findings suggest that researchers should consider whether the nature of the

dependent variables for which their self-affirmation interventions are best designed to change,

whether attitudinal/cognitive or behavioural in nature. In the case of envy, this may involve

testing whether a kindness self-affirmation manipulation produces significant behavioural

changes that would suggest reduced envy, while also assessing its impact on self-reported envy

feelings. Assessing readiness for change may prove more difficult in the context of envy than for

other, often health-related concerns, such as alcohol abuse, particularly due to the strong social

undesirability of admitting to envy or lack of awareness or recognition of this emotion (Smith et

al., 1999). Nonetheless, assessing the extent to which individuals view envy as a problem in their

lives and are motivated to take action to improve their coping may be an important moderator of self-affirmation's effectiveness.

Limitations of the Present Study

Although the present study provided a novel and important test of self-affirmation theory and its application to envy, several potential limitations should be noted. First, the use of an undergraduate student sample may limit generalizability of the findings. Although the participant sample was relatively homogeneous with respect to age and program year, the purposeful over-recruitment of individuals with elevated dispositional envy more closely approximated a clinical sample than it might have otherwise. In addition, the self-integrity threat in the domain of academics used in the present study would appear to have been an ideal match to the undergraduate university participant sample, as the threat may have proven less effective among individuals who are not enrolled in university.

Secondly, the psychoeducational handout - while encouraging several courses of action (e.g., learning from advantaged others) along with a brief rationale for each strategy - contained some inherent weaknesses when considered in retrospect. The handout was presented at the conclusion of a 80-90 minute timeslot when participants were likely fatigued and eager to exit the study, and may have been less likely to attend to its recommendations. In addition, the descriptions of the strategies were brief and somewhat non-specific, suggesting that participants might have experienced difficulty applying an abstract idea (e.g., try not to feel too angry) into concrete action across a variety of settings. Finally, the present study included no indicators of how students evaluated this information (e.g., helpful or unhelpful, positive vs. negative or neutral) or whether they formed intentions to incorporate any or all of the strategies into their daily lives.

A third issue concerns the length of the time interval between the intervention and follow-up. A one-month follow-up period was selected over a more conventional one-week interval because several studies have documented treatment effects lasting for up to a month, several months, and even as long as three years (e.g., Sherman et al., 2013). In addition, the longer time interval was intended to allow students more opportunities to adaptively cope with envy feelings and thereby initiate a positive recursive cycle, perhaps reducing the frequency and/or intensity of envy experiences over time. As no data was collected at a one-week follow-up, it is impossible to determine whether a treatment effect would have been evident at this shorter interval. It is worth noting that most self-affirmation studies documenting treatment effects lasting longer than one week have included multiple interventions (although the intervals between interventions vary), suggesting that repeated doses of self-affirmation may be required to, or may simply facilitate, the extended benefits reported in the research literature. Studies that have included repeated self-affirmation interventions have tended to vary the specific intervention delivered to participants by varying the wording and structure of self-affirmation tasks (Sherman et al., 2013) or providing a briefer intervention (Wileman et al., 2016) at subsequent intervals.

Future Directions

The following section discusses four primary considerations for future research involving self-affirmation and envy. First, I review promising alternatives to non-cooperation that may assess likely behavioural manifestations of envy. Second, I discuss how self-affirmation intervention studies may be enhanced to promote longer-term benefits to coping with envy. Third, I consider how self-affirmation interventions can be selectively applied to at-risk individuals and social contexts where envy is most likely to arise. Finally, I note several clinical

applications of self-affirmation and discuss the importance of extending research on envy into this domain.

Alternative measures of envy-related behaviour.

In light of the problems with non-cooperation as a measure of aggression noted earlier, are there alternative, viable behavioural proxies for malicious envy? Laboratory-based measures that assess interpersonal aggression such as "burning" (Zizzo & Oswald, 2001) or noise blasts (Bushman & Baumeister, 1998) may have potential. The former assesses the extent to which participants are willing to engage in spiteful behaviour, sacrificing some portion of their monetary earnings in a research study in order to sabotage an advantaged (and presumably envied) participant. While Zizzo and Oswald (2001) did not include a measure of envy to provide a measure of convergent validity, the self-destructive and irrational nature of burning would appear to be closely linked to the characteristics of malicious envy (e.g., Klein, 1957/1975). Subsequent studies that included measures of burning and envy yielded inconsistent results, with one each reporting positive (Wobker, 2015), mixed (Wobker & Kenning, 2013), and null (Neufeld & Johnson, 2016) relations between these variables.

Noise blasts involve delivering a burst of sound to an opponent by pressing a button; delivering more blasts of greater intensity and/or duration have been operationalized as a behavioural measure of interpersonal aggression (Bushman & Baumeister, 1998). While noise blasts have not been directly linked to envy, individuals with prominent grandiose narcissism - a trait with important theoretical[36] links to envy (e.g., Kernberg, 2007) - appear to be characteristically provoked to deliver stronger noise blasts under conditions involving ego threat (Bushman et al., 2009). Prior research has found that higher grandiose narcissism scores

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[36] Recent research suggests that grandiose narcissism aspects related to fear of failure predict greater malicious envy, providing the first empirical linkage between grandiose narcissism and envy (Lange, Crusius, & Hagemeyer, 2016).

predicted that individuals would deliver longer and louder noise blasts against others following insult or humiliation, but did not broadly predict aggression against those who delivered praise or against neutral third parties (Bushman & Baumeister, 1998; Bushman et al., 1999). Elsewhere, grandiose narcissism predicted greater intensity noise blasts against an opponent after being publicly shamed for their loss, but not after simply losing (Thomaes et al., 2008). While self-affirmation failed to impact the intensity of noise blasts in the sole study that investigated this relationship (Tang & Schmeichel, 2015), the authors did observe that self-affirmation facilitated faster cardiovascular recovery after receiving insulting feedback on the quality of one's essay writing. Whether self-affirmation attenuates noise blasts (i.e., interpersonal aggression) in a situation where envy feelings are manipulated, however, remains to be seen. Moreover, evaluations of decisions in a noise blast paradigm could be combined with measures of disparagement - another common form of aggressive behaviour (Rentzsch, Schröeder-Abé, & Schütz, 2015) that may be particularly pronounced toward an advantaged or high-status rival (Horton & Sedikides, 2009) and is linked to grandiose narcissism (Vaillancourt, 2013).

Alternatively, researchers may consider assessing behaviour outside of the artificial context of the laboratory - an approach that may confer an additional advantage of examining behaviour change over time. Indeed, two real-world self-affirmation studies have been shown to reduce aggression among older children and adolescents. Thomaes and colleagues (2009) observed that self-affirmation reduced peer-reported aggressive behaviour among individuals with elevated narcissistic traits for a one-week period (though not at 4-6 week follow-up). More recently, Armitage and Rowe (2016) found that affirmed participants engaged in significantly less relational aggression at one-month follow-up than controls according to self-report data, a medium-sized effect ($d = .50$). Importantly, the latter study included a psychoeducation

component that described examples of relational aggression (e.g., spreading gossip, leaving others out of activities) and outlined the destructive consequences for others (e.g., feeling anxious or depressed) and self (e.g., feeling guilt), similar to the present study. One key difference may have been their use of a kindness self-affirmation manipulation (Reed & Aspinwall, 1998) in place of the values essay, further suggesting that this alternate form of the intervention may be better suited to behavioural outcomes (cf. Sweeney & Moyer, 2015).

Establishing links between covert envy states and overt behavioural manifestations of this emotion are likely to prove difficult, not least because of the myriad factors that influence behaviour. Utilizing thorough pilot testing for prospective behavioural indicators as well as other measures to establish convergent and divergent validity may prove useful in identifying and validating good candidates. For example, a behavioural indicator might be reasonably understood as being highly influenced by envy feelings if the frequency or intensity of the behaviour is sensitive to the degree of fairness in the situation[37] or after establishing and controlling for a baseline of aggressive behaviour. Alternatively, these behavioural indicators could be assessed alongside participants' stated (or rated) motives for engaging in aggressive behaviour in order to determine its convergence with envy-consistent motivation (i.e., inferiority, hostility, resentment) and consequences (e.g., schadenfreude), while being less influenced by envy-inconsistent or more distantly related motives (e.g., revenge, curiosity, competitiveness) or outcomes (e.g., regret, prosocial feelings toward rival).

Producing a lasting self-affirmation effect on envy.

Enacting durable cognitive and behavioural changes to reduce the impact of envy over time requires that individuals recognize envy as problematic and accept that alternative action

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[37] For example, pilot testing could assess whether participants engage in more frequent or intense aggression at high (vs. low) levels of unfairness, and whether this pattern is consistent at intermediate anchor points (e.g., moderate unfairness).

may be beneficial[38] Yet even when individuals are motivated to act, goal-directed action may

often prove difficult (c.f. Gollwitzer & Sheeran, 2006). One promising solution involves helping

participants to specify implementation intentions - planned behavioural responses that one

wishes to perform in the future in response to a specific stimuli that often take the form of if-then

plans, such as "when situation x arises, I will perform response y" (Gollwitzer, 1999, p. 494).

Implementation intentions have been used both as a supplement to, or replacement for, existing

self-affirmation interventions.

Subsequent research has confirmed that implementation intentions predict greater goal

striving and perseverance despite unwanted influences, while increasing the accessibility of

target situations and ease or automaticity with which the intended behavioural response can be

initiated (Gollwitzer & Sheeran, 2006). Implementation intentions have also produced promising

results in several health promotion domains (although see Jessop, Sparks, Buckland, Harris, &

Churchill, 2014, for an exception involving physical exercise). Forming implementation

intentions have been shown to reduce alcohol consumption in both adults (Armitage et al., 2011;

Armitage & Arden, 2016; Norman & Wrona-Clarke, 2016) and adolescents (Armitage, Rowe,

Arden, & Harris, 2014), increase fruit and vegetable consumption over a 7-day period (Harris et

al., 2014), and even reduce employee's job-related anxiety and improve self-efficacy over a 3-

week period (Morgan & Harris, 2015).

Although standard self-affirmation and implementation intention interventions may

perform comparably (Armitage et al., 2011), there may be good reason to utilize both strategies.

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[38]This is, of course, a rather large assumption. Individuals may be unaware of their envious tendencies, unwilling to acknowledge them, and/or commonly transmute these emotions into more socially and personally acceptable forms (cf. Smith et al., 1999; Smith & Kim, 2007). However, most individuals could be reasonably expected to endorse having had at least some instances of envy and view these experiences as undesirable and even painful. Moreover, self-affirmations have been repeatedly shown to help individuals make less biased and defensive judgments while also feeling less threatened by the self-evaluative implications of social experiences (Sherman & Cohen, 2006), suggesting that affirmed individuals may be more aware of and willing to admit existing envy feelings.

Some research suggests that self-affirmation may help to facilitate the formation of more specific

and comprehensive implementation intentions (Ferrer, Shmueli, Bergman, Harris, & Klein,

2012), suggesting that it may promote adaptive behaviour change if participants are encouraged

to formulate such plans. In addition, implementation intentions may exert an additive effect and

produce more adaptive behavioural outcomes than standard self-affirmation interventions alone

(Armitage et al., 2011; Norman & Wrona-Clarke, 2016).

Forming implementation intentions may help to address both the null findings of self-

affirmation on behavioural manifestations of envy (i.e., non-cooperation) and envy intensity at

one-month follow-up. This adjunct component could follow a psychoeducational intervention

similar to the one provided in the present study, focused on conceptualizing envy and why

malicious (but not benign) envy is problematic, and recommending concrete strategies to cope

with the emotion - including both cognitive strategies involving self-talk and behavioural

strategies encouraging adaptive actions or discouraging maladaptive ones. Harris and colleagues'

(2014) approach to helping participants form implementation intentions to increase fruit and

vegetable consumption provides a valuable template that could be readily applied with some

adaptation. In their study, participants completed the *then* portion of an "*if..., then...*" plan,

completing both action plans intended to promote behaviours leading to greater consumption, as

well as coping plans to target excuses to avoid fruit and vegetable consumption.

Applied to envy, participants could select several situations or settings in which they are

likely to experience envy from a list containing many common envy-inducing options (e.g., an

upcoming exam or class presentation; musical or athletic competition; a conversation with a

more talented friend, etc.). For each selected setting, participants could complete two "*if...,*

then..." sentence stems in order to form implementation intentions, with one statement each

focused on cognitive and behavioural strategies to promote better coping.[39] Such an approach

would encourage participants to anticipate high-risk situations where envy is likely and help

them develop a plan for how to respond if and when the situation arises. A simpler alternative,

akin to that used by Armitage and colleagues (Armitage et al., 2011; Armitage et al., 2014),

would be to provide a statement such as, "If I feel envious of someone else, I will..." and have

participants choose a preferred coping strategy from among several options and re-write the

sentence in its entirety.

Self-affirmation as a selective social psychology intervention for envy.

Certain interventions to improve health and wellbeing are most effective when delivered

as widely as possible (e.g., vaccinations), while others may be most successful if targeted

selectively to at-risk individuals (e.g., genetic testing). The bulk of extant research suggests that

self-affirmation interventions may be best understood as part of this latter group (Cohen &

Sherman, 2014). Indeed, the present study found that individuals most likely to experience envy

benefitted most from the intervention, in line with research elsewhere suggesting individuals

who are most psychologically vulnerable to a particular threat are most helped by self-

affirmation (Sherman, Bunyan, et al., 2009). The present study illuminates certain characteristics

that might be screened and identified in determining at-risk individuals for strong envy reactions

- namely, elevated dispositional envy and vulnerable narcissism, as well as low self-compassion.

These at-risk traits - particularly dispositional envy - may be important to screen for when

designing future studies assessing self-affirmation's impact on envy.

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[39] For instance, if a participant had selected "Upcoming exam " as an important setting, (s)he could be provided with the prompt, "If I notice that a classmate scores higher than me on an important exam, then I will..." This participant could then complete the two following prompts in parentheses: "(write in what you will say or think to yourself to help you cope effectively); (write in an action you will take, or not take, to help yourself cope better now and/or in the future)." Following Harris et al's (2014) procedure, several examples of filled-in statements would be provided.

What other factors might be important considerations for research design? Envy has primarily been studied among university students in the context of upward social comparisons with ostensibly smarter and/or more successful hypothetical or real peers. As a result, the focus of envy has been narrowly focused on intelligence and academic proficiency. However, strong feelings of envy can arise in a variety of contexts (e.g., Smith & Kim, 2007) and have been studied in contexts ranging from organizations and workplaces (Dogan & Vecchio, 2001; Duffy, Shaw, & Schaubroeck, 2008), to intergroup relations (in which it may foster prejudice; Smith & Kim, 2007), and consumerism (Belk, 2008). Each of these domains provide potential opportunities to examine self-affirmation effects on envy.

The potential for an upward comparison to elicit envy in a given domain may be subject to some important sex differences. In line with evolutionary hypotheses, DelPriore, Hill, and Buss (2012) noted that undergraduate women reported stronger envy relative to men with regard to domains involved in attracting a mate, including physical attractiveness, their romantic partner's financial prospects, and virginity. In contrast, undergraduate men reported stronger envy than women for comparisons relating to obtaining and maintaining a desirable romantic partner, including involving having an attractive romantic partner, possessing greater athletic talent, or superior status or prestige. However, men and women were comparably envious with respect to other advantages, such as talent in an important self-domain or intelligence.[40] These findings indicate that sex differences in envy may be largely irrelevant in academic contexts where it is typically studied, but may play an important role in other settings where envy may be evoked.

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[40] DelPriore et al. (2012) reported that intelligence was among the most envy-eliciting domains for both women and men, further suggesting that the self-integrity threat to intelligence used in the present study was particularly salient and important for this population.

Another important factor in designing self-affirmation studies, both in general and in the context of envy, is the timing of the intervention. As Sherman et al. (2013) emphasize, self-affirmation interventions may be most potent if delivered during difficult transition points or times of high stress. These authors further contend that timing may be more important than the number of self-affirmation interventions delivered.

Weaving together these considerations of personality dynamics, environment, sex differences, and intervention timing would grant creative researchers ample opportunities to design and implement laboratory- and real-world-based experiments assessing self-affirmation's impact on envy. Competitive sports, as an example, involve zero-sum competition in which the success or failure of a given athlete is readily apparent and highly visible against similar others who likewise place high value on their athletic performance - factors that are likely to fuel feelings of envy (Alicke & Zell, 2008). For elite athletes in particular, the external consequences of underperformance may be severe, costing athletes opportunities to compete in future high-profile games, as well as possible sponsorships, athletic scholarships, or other financial gains. In this context, a self-affirmation manipulation might plausibly be delivered prior to an athletic competition or team try-out. Self-affirmation might plausibly improve athletic performance, as might be suggested by tangentially related studies demonstrating improved academic performance over time (Sherman et al., 2013) and improved problem-solving (Creswell, Dutcher, Klein, Harris, & Levine, 2013) among those at risk to underperform. More likely, self-affirmation might be hypothesized to attenuate stress response during the competition (Creswell et al., 2005) and decrease envy feelings and envy-motivated behaviour (e.g., gossip, sabotage) toward advantaged rivals following non-optimal performance, as these upward social comparisons might be perceived as less threatening due to preserved self-integrity. Other

alternative contexts might include coping with coworker promotions in the workplace, inferior performance at an adjudicated music festival or competition, or even comparing one's romantic relationship, financial situation, and/or vocational prospects (or lack thereof) to similar peers, to list a few possibilities.

Self-affirmation and envy in clinical contexts.

Self-affirmation has primarily been conceptualized and discussed as a social psychology intervention, one that has proven particularly adept in domains involving health messages and stereotype threat (e.g., Cohen & Sherman, 2014). However, a growing body of research suggests that self-affirmation may have a valuable role to play in addressing a variety of clinical problems. For example, self-affirmation interventions have been shown to reduce rumination (Koole et al., 1999) and paranoia (Kingston & Ellett, 2014), albeit both in nonclinical contexts, but have most commonly been linked to interpersonal behaviours. Affirmed participants may be less likely to engage in behaviours that undermine relationships, both romantic (Jaremka et al., 2011) and with peers (e.g., Thomaes et al., 2009), as well as offer better apologies when they do transgress (Schumann, 2014), suggesting a greater likelihood of repairing (vs. exacerbating) relationship rifts. Longitudinal research has shown that self-affirmation may help insecure individuals to feel more secure in close relationships and promote an objectively friendlier, less tense social demeanour - expressions likely to maintain or enhance these relationships - for up to two months post-intervention (Stinson, Logel, Shepherd, & Zanna, 2011). Indeed, self-affirmation may promote both greater self-compassion and outwardly prosocial behaviours (Lindsay & Creswell, 2014).

Ehret and colleagues (2015) provide the most comprehensive attempt to outline how self-affirmation might be integrated into a clinical context. Their paper describes how values essays

might be effectively utilized within a Motivational Interviewing (MI; Miller & Rollnick, 1991)

framework to reduce problematic alcohol use. In particular, these authors suggest that

completing a self-affirmation intervention at the outset of therapy may help to reduce initial

defensiveness to accepting threatening health behaviour messages and personal risk perceptions.

They further note that the content of values essays may be a valuable motivational "fulcrum for

change" (p. 96), as therapists could draw upon important self-domains to both bolster self-

integrity and to illustrate how drinking affects other values in one's life (e.g., important

relationships).

Although envy is not a diagnosable clinical disorder, this emotion may accompany a

range of clinical presentations. Envy is a diagnostic symptom of Narcissistic Personality

Disorder (APA, 2013) and chronic envy is also significantly and positively correlated with

symptoms of depression and anxiety, obsessive-compulsive tendencies, and paranoid ideation

(Gold, 1996). Moreover, a tendency to experience frequent and intense envy is associated with a

range of other negative indicators, including lower self-esteem, life satisfaction, and happiness,

and greater resentment and hostility (Smith et al., 1999). Envy is unlikely to lead an individual to

seek clinical services, but its associations with indicators of maladjustment suggest it may erode

wellbeing and contribute to a need for intervention (Smith & Kim, 2007) and undermine the

effectiveness of therapy if left unchecked (Kernberg, 2007). A paucity of research has focused on

clinical interventions to reduce envy and promote adaptive coping, suggesting that there is much

work yet to do in this area such as testing out the recommendations of envy researchers (e.g.,

Exline & Zell, 2008; Harris & Salovey, 2008; Salovey & Rodin, 1988).

Utilizing self-affirmation interventions in a clinical context may require a slightly

modified delivery from social psychology contexts including greater transparency as to the

intervention's purpose. Providing greater awareness of the affirmation intervention and its purpose is potentially problematic; while consistent with ethical imperatives to seek informed consent from clients (e.g., Canadian Psychological Association, 2000), doing so can undermine the intervention's effectiveness (Sherman, Cohen, et al., 2009). However, subsequent research has shown that this attenuation effect only applies when self-affirmation interventions are externally imposed; the intervention remains effective when participants are permitted a degree of choice (e.g., whether or not to affirm, or which value to affirm; Silverman et al., 2013). That self-affirmation interventions can prove effective even with awareness suggests that individuals may be trained to use this process as a deliberate coping strategy (Silverman et al., 2013). While the difficulty of this task is as of yet unknown, recent research has suggested that individuals who spontaneously self-affirm in the face of threats experience a range of beneficial outcomes (Ferrer et al., 2015; Persoskie et al., 2015; Taber et al., 2016).

Conclusion

The present study is the first to examine whether self-affirmation may be a viable antidote to malicious envy. Certain results from the laboratory supported this possibility, as affirmed participants reported feeling less envious of an ostensibly smarter and financially advantaged rival student. Moreover, the results provided some insight as to for whom the intervention may be most helpful, as participants who were most psychologically vulnerable - dispositionally envy-prone and low in self-compassion - benefitted most. However, there were also apparent limits to the intervention's effectiveness as it did not facilitate greater cooperation nor protect against envy at one-month follow-up. Overall, the results provide a promising extension of self-affirmation theory into a problem domain with few obvious - and no tested - solutions. In addition, this manuscript highlights several important challenges facing envy

researchers with respect to measuring behavioural manifestations of envy and promoting

effective coping over time, potential adaptations that may improve the efficacy of self-

affirmation interventions for envy, and the importance of expanding this research question into

other contexts where experiences of envy are likely to arise.

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Appendix A: Mass Testing Measures

Dispositional Envy Scale (Smith, Parrott, Diener, Hoyle, & Kim, 1999)

Instructions: Please rate your agreement with each of the following statements.

Strongly Disagree	Moderately Disagree	Neither agree nor disagree	Moderately Agree	Strongly Agree
1	2	3	4	5

1. I feel envy every day.

    1   2   3   4   5

2. The bitter truth is that I generally feel inferior to others.

    1   2   3   4   5

3. Feelings of envy constantly torment me.

    1   2   3   4   5

4. It is so frustrating to see some people succeed so easily.

    1   2   3   4   5

5. No matter what I do, envy always plagues me.

    1   2   3   4   5

6. I am troubled by feelings of inadequacy.

    1   2   3   4   5

7. It somehow doesn't seem fair that some people seem to have all the talent.

    1   2   3   4   5

8. Frankly, the success of my neighbours makes me resent them.

    1   2   3   4   5

Importance of Intelligence items (modified items based on Sedikides & Skowronski, 1993)

1. How important is intelligence to your self-concept?

Not at all central   Neutral   Extremely central
to my self-concept   to my self-concept

       1   2   3   4   5   6   7   8   9

2. How often do considerations of your intelligence influence your behaviour?

       Never   Occasionally   Sometimes   Often   Always

       1   2   3   4   5   6   7   8   9

3. How badly would you feel if you were forced to conclude that, based on a review of the
    evidence, you did not possess as much intelligence as you thought you did?

    Not at all bad   Somewhat bad   Very bad

       1   2   3   4   5   6   7   8   9

Appendix B: Part 1 Measures

Consent Form - Part 1

Study Title: Personality, values, intelligence and decision-making during a competitive task.

Principal Investigator: Mr. Darren Neufeld, Department of Psychology
                              (Phone and email contact provided here)

Research Supervisor: Dr. Ed Johnson, Associate Professor, Psychology
                              (Phone and email contact provided here)

Sponsors: University of Manitoba
                              Social Sciences and Humanities Research Council of Canada

This consent form, a copy of which you may print for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Purpose and eligibility. Darren Neufeld is conducting his Doctoral dissertation under the supervision of Dr. Ed Johnson. The purpose of this study is to examine how people's personality styles, personal values, and intelligence may influence their decision-making during a competitive multi-round mutual decision task. If you are 18 years of age or older you are eligible to participate in this study.

Procedures. If you agree to participate in this portion of this study, you will be asked to complete a number of online personality questionnaires and demographic measures. The self-report personality measures include a total of 120 items assessing qualities such as self-esteem, self-compassion, and self-confidence. You will also be asked to provide demographic information about your age, gender, education level and ethnicity. This portion of the study is completed online; while you will sign up for a physical timeslot, this only determines when the link will be sent to your UM email address. You will have 24 hours to complete the survey from this time. The survey is anticipated to take 25-30 minutes to complete.

Benefits of participation. A direct benefit that you may obtain by participating in this study is a greater awareness of your own personality, values, and intellectual abilities through the process of reflecting on your answers to the questions in this study. An indirect benefit of your participation is that by participating you are contributing to the advancement of scientific

knowledge concerning the relationship of personality, values, and intelligence to decision-making.

Risks of participation. This portion of the study involves completing a variety of personality measures. It is possible you may identify personality qualities or traits that surprise or concern you during this process. If you do, remember that you are free to discontinue your participation in the study at any point without any negative consequences. If you do experience any kind of emotional upset or distress as a result of participating in this study and you wish to speak to a trained counselor about your experience, you may access any of the following free resources (below). These resources will also be distributed at a later point in the study for your convenience.

- University of Manitoba Student Counselling and Career Centre: 474 Univ. Ctr. 474-8592
- University of Manitoba Psychological Services Centre: 162A Dafoe Bldg. 474-9222
- Klinic 24-hour crisis line: 786-8686

Data anonymity and storage. The data you provide in this study is linked only by your UM email address. The online data will be stored in a password-protected file accessible only to the Principal Investigator and Research Supervisor. Once all data has been collected, the paper copies will be securely destroyed and the identifying aspect (UM email) will be stripped from the data file, rendering it anonymous. This means that no one, including the research assistant and principal investigator, will be able to link you with your data. Both processes are anticipated to occur by March/April 2015. Once the study data has been made anonymous, it will be maintained indefinitely on the Principal Investigator's research computer.

Participation credit. In exchange for your participating in Part 1 of this study, you will receive **one (1) credit** toward your research-participation requirement for your Introduction to Psychology class. If you participate in the subsequent parts of this study, you will receive three (3) credits for Part 2, one (1) for Part 3, and one (1) for completing all 3 parts of the study. Credits will generally be forwarded to the Study Pool Coordinator for processing within two business days of participation. Please contact the Principal Investigator if you have any concerns related to receiving credit for your participation.

How to withdraw from the study. You may cease to participate altogether in the study at any time. Alternatively, you may also choose to not answer any question or complete any of the study measures that you choose. Neither of these actions will result in any negative consequences. To cease your participation in the study simply contact the Principal Investigator by email or phone and simply explain that you wish to be excused and provide him with your study materials. If you are in any way upset by the study procedures please discuss this with the Principal Investigator. The Principal Investigator will help ensure you receive any assistance you may require and will also ensure you receive credit for participation.

Debriefing. There is no debriefing following Part 1 of this study. However, the Principal Investigator will provide a debriefing for all aspects in Parts 1 and 2 of the study at the conclusion of Part 2. You will have the opportunity to discuss your experiences and ask the Principal Investigator any questions you may have. The counselling resources mentioned earlier in this consent form will be re-distributed at this point as well. A short written debriefing will follow your participation in Part 3 of the study that will provide a summary of all aspects of this study. You will be encouraged to contact the Principal Investigator to answer any questions you may have.

Dissemination of findings. The findings from this research will be presented in aggregate (group) form to psychology researchers and practitioners at psychology conferences and in a scientific peer-reviewed journal to researchers and other interested persons. Presentation of the study findings will not jeopardize the anonymity of your data.

Study feedback. A brief (1-3 page) summary of the study results in aggregate form will be provided to you approximately 4 to 6 weeks after the completion of data collection via email (approximately May 2015). If you would like to receive feedback, please click the box "YES, I would like to receive a summary of the results" below.

_____ YES, I would like to receive a summary of the results

Signed Consent. By clicking "YES, I consent" below on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. If you do choose to withdraw from this study, we will destroy any data that you have provided and not include it in the analysis. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

_____ YES, I consent   _____ NO, I do not consent (exit)

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

If you have any questions about this research, feel free to phone or email the Principal Investigator (see above). This research has been approved by the Psychology/Sociology Fort Garry Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator (HEC) at 474-7122. You are encouraged to print a copy of this consent form for your records and reference; it will not be available later except by request.

Demographic Questionnaire

1. What is your age: ___

2. What is your sex: _____ Female; _____Male;

3. What year are you completing in university: ___ first; ___ second; ___ third; ___ fourth or higher;

4. First language: ___ English ___ French ___ Other

If English is not first language: How many years have you: ___ spoken English ___ read English

5. Ethnicity: Please select the *one* ethnicity that best fits you:

___Aboriginal/First Nations
___Arab/West Asian (e.g., Armenian, Egyptian, Iranian, Lebanese, Morroccan)
___Black (African)
___Chinese
___Filipino
___Japanese
___Korean
___Latin American
___Métis
___South Asian (e.g., East Indian, Pakistani, Punjabi, Sri Lankan)
___South East Asian (e.g., Cambodian, Indonesian, Laotian, Vietnamese)
___White/European (e.g., English, French, Scottish, Irish)
___Other

Pathological Narcissism Scale

(Pincus, Ansell, Pimentel, Cain, Wright, & Levy, 2009)

Instructions: Please respond to the following statements by selecting the number that best reflects your own beliefs.

Not Like Me At All					Very Much Like Me
0	1	2	3	4	5

1. I often fantasize about being admired and respected.

   0   1   2   3   4   5

2. My self-esteem fluctuates a lot.

   0   1   2   3   4   5

3. I sometimes feel ashamed about my expectations of others when they disappoint me.

   0   1   2   3   4   5

4. I can usually talk my way out of anything.

   0   1   2   3   4   5

5. It's hard to feel good about myself when I'm alone.

   0   1   2   3   4   5

6. I can make myself feel good by caring for others.

   0   1   2   3   4   5

7. I hate asking for help.

   0   1   2   3   4   5

8. When people don't notice me, I start to feel bad about myself.

   0   1   2   3   4   5

9. I often hide my needs for fear that others will see me as needy and dependent.

   0   1   2   3   4   5

10. I can make anyone believe anything I want them to.

   0   1   2   3   4   5

11. I get mad when people don't notice all that I do for them.

   0   1   2   3   4   5

12. I get annoyed by people who are not interested in what I say or do.

   0   1   2   3   4   5

13. I wouldn't disclose all my intimate thoughts and feelings to someone I didn't admire.

    0   1   2   3   4   5

14. I often fantasize about having a huge impact on the world around me.

    0   1   2   3   4   5

15. I find it easy to manipulate people.

    0   1   2   3   4   5

16. When others don't notice me, I start to feel worthless.

    0   1   2   3   4   5

17. Sometimes I avoid people because I'm concerned that they'll disappoint me.

    0   1   2   3   4   5

18. I typically get very angry when I'm unable to get what I want from others.

    0   1   2   3   4   5

19. I sometimes need important others in my life to reassure me of my self-worth.

    0   1   2   3   4   5

20. When I do things for other people, I expect them to do things for me.

    0   1   2   3   4   5

21. When others don't meet my expectations, I often feel ashamed about what I wanted.

    0   1   2   3   4   5

22. I feel important when others rely on me.

    0   1   2   3   4   5

23. I can read people like a book.

    0   1   2   3   4   5

24. When others disappoint me, I often get angry at myself.

    0   1   2   3   4   5

25. Sacrificing for others makes me the better person.

    0   1   2   3   4   5

26. I often fantasize about accomplishing things that are probably beyond my means.

    0   1   2   3   4   5

27. Sometimes I avoid people because I'm afraid they won't do what I want them to.

    0   1   2   3   4   5

28. It's hard to show others the weaknesses I fell inside.

    0   1   2   3   4   5

29. I get angry when criticized.

    0   1   2   3   4   5

30. It's hard to feel good about myself unless I know other people admire me.

    0   1   2   3   4   5

31. I often fantasize about being rewarded for my efforts.

    0   1   2   3   4   5

32. I am preoccupied with thoughts and concerns that most people are not interested in me.

    0   1   2   3   4   5

33. I like to have friends who rely on me because it makes me feel important.

    0   1   2   3   4   5

34. Sometimes I avoid people because I'm concerned they won't acknowledge what I do for them.

    0   1   2   3   4   5

35. Everybody likes to hear my stories.

    0   1   2   3   4   5

36. It's hard for me to feel good about myself unless I know other people like me.

    0   1   2   3   4   5

37. It irritates me when people don't notice how good a person I am.

    0   1   2   3   4   5

38. I will never be satisfied until I get all that I deserve.

    0   1   2   3   4   5

39. I try to show what a good person I am through my sacrifices.

    0   1   2   3   4   5

40. I am disappointed when people don't notice me.

    0   1   2   3   4   5

41. I often find myself envying others' accomplishments.

    0   1   2   3   4   5

42. I often fantasize about performing heroic deeds.

    0   1   2   3   4   5

43. I help others in order to prove I'm a good person.

    0   1   2   3   4   5

44. It's important to show people I can do it on my own, even if I have some doubts inside.

    0   1   2   3   4   5

45. I often fantasize about being recognized for my accomplishments.

    0   1   2   3   4   5

46. I can't stand relying on other people because it makes me feel weak.

    0   1   2   3   4   5

47. When others don't respond to me the way that I would like them to, it is hard for me to still feel ok with myself.

    0   1   2   3   4   5

48. I need others to acknowledge me.

    0   1   2   3   4   5

49. I want to amount to something in the eyes of the world.

    0   1   2   3   4   5

50. When others get a glimpse of my needs, I feel anxious and ashamed.

    0   1   2   3   4   5

51. Sometimes it's easier to be alone than to face not getting everything I want from other people.

    0   1   2   3   4   5

52. I can get pretty angry when others disagree with me.

    0   1   2   3   4   5

Rosenberg Self-Esteem Scale (Rosenberg, 1965)

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, write "1". If you agree with the statement, write "2". If you disagree, write "3". If you strongly disagree, write "4".

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

_____ 1. On the whole, I am satisfied with myself.

_____ 2. At times, I think I am no good at all. (R)

_____ 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. (R)

_____ 6. I certainly feel useless at times. (R)

_____ 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. (R)

_____ 9. All in all, I am inclined to feel that I am a failure. (R)

_____ 10. I take a positive attitude toward myself.

Note. (R) indicates reverse scoring.

Psychological Entitlement Scale

(Campbell, Bonacci, Shelton, Exline, & Bushman, 2004)

Instructions: Please respond to the following statements by selecting the number that best reflects your own beliefs.

Strong Disagreement			Neutral		Strong Agreement	
1	2	3	4	5	6	7

_____ 1. I honestly feel I'm just more deserving than others.

_____ 2. Great things should come to me.

_____ 3. If I were on the Titanic, I would deserve to be in the *first* lifeboat!

_____ 4. I demand the best because I'm worth it.

_____ 5. I do not necessarily deserve special treatment. (R)

_____ 6. I deserve more things in my life.

_____ 7. People like me deserve an extra break now and then.

_____ 8. Things should go my way.

_____ 9. I feel entitled to more of everything.

Note. (R) indicates reverse scoring.

Self-Compassion Scale (Neff, 2003)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost Never				Almost Always
1	2	3	4	5

_____ 1. I'm disapproving and judgmental about my own flaws and inadequacies. (R)

_____ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong. (R)

_____ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.

_____ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world. (R)

_____ 5. I try to be loving towards myself when I'm feeling emotional pain.

_____ 6. When I fail at something important to me I become consumed by feelings of inadequacy. (R)

_____ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.

_____ 8. When times are really difficult, I tend to be tough on myself. (R)

_____ 9. When something upsets me I try to keep my emotions in balance.

_____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____ 11. I'm intolerant and impatient towards those aspects of my personality I don't like. (R)

_____ 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.

_____ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am. (R)

_____ 14. When something painful happens I try to take a balanced view of the situation.

_____ 15. I try to see my failings as part of the human condition.

_____ 16. When I see aspects of myself that I don't like, I get down on myself. (R)

_____ 17. When I fail at something important to me I try to keep things in perspective.

_____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it. (R)

_____ 19. I'm kind to myself when I'm experiencing suffering.

_____ 20. When something upsets me I get carried away with my feelings. (R)

_____ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering. (R)

_____ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.

_____ 23. I'm tolerant of my own flaws and inadequacies. (R)

_____ 24. When something painful happens I tend to blow the incident out of proportion. (R)

_____ 25. When I fail at something that's important to me, I tend to feel alone in my failure. (R)

_____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

Note. (R) indicates reverse scoring.

Validity Manipulation Check

Not at all	Not very	Somewhat	Very	Completely
1	2	3	4	5

1. Please rate how *attentive* you were while completing this study.

2. Please rate how *honest* you were while completing this study.

3. Please rate how *distracted* you were while completing this study.

Appendix C: Part 2 Measures

Consent Form - Part 2

UNIVERSITY OF MANITOBA

Study Title: Personality, values, intelligence and decision-making during a competitive task.

Principal Investigator: Mr. Darren Neufeld, Department of Psychology
(Phone and email contact provided here)

Research Supervisor: Dr. Ed Johnson, Associate Professor, Psychology
(Phone and email contact provided here)

Sponsors: University of Manitoba
Social Sciences and Humanities Research Council of Canada

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Purpose and eligibility. Darren Neufeld is conducting his Doctoral dissertation under the supervision of Dr. Ed Johnson. The purpose of this study is to examine how people's personality styles, personal values, and intelligence may influence their decision-making during a competitive multi-round mutual decision task. If you are 18 years of age or older you are eligible to participate in this study.

Procedures. If you agree to participate in this portion of the study, you will meet in-person to complete measures assessing personal values, a brief intelligence test involving verbal and non-verbal problem solving, and participate in a competitive multi-round mutual decision game. All participants will be entered in a random drawing for monetary payouts corresponding to the amount of points earned during the game; three participants will receive this payout (approximately $15 to $20) at a later date once data collection has been concluded. You will also be asked to provide ratings of your current mood and emotions throughout this phase of the study, which is expected to take 75-90 minutes to complete.

Benefits of participation. A direct benefit that you may obtain by participating in this study is a greater awareness of your own personality, values, and intellectual abilities through the process of reflecting on your answers to the questions in this study. An indirect benefit of your participation is that by participating you are contributing to the advancement of scientific

knowledge concerning the relationship of personality, values, and intelligence to decision-making.

Risks of participation. This portion of the study involves rating and writing about personal values, completing a brief test of cognitive ability, and competing in a multi-round mutual decision game. Regarding the test of cognitive abilities, you may find taking these tests somewhat stressful, frustrating, or disappointing insofar as there is time-pressure and your performance may not be as high as expected. You may also experience the multi-round mutual decision task may be similarly stressful, frustrating, or disappointing insofar as your outcomes depend on the actions of an opponent and the task is competitive. If you encounter any of these reactions or any other response that concerns you, remember that you are free to discontinue your participation in the study at any point without any negative consequences. If you do experience any kind of emotional upset or distress as a result of participating in this study and you wish to speak to a trained counselor about your experience, you may access any of the following free resources (below). These resources will also be distributed at a later point in the study for your convenience.
- University of Manitoba Student Counselling and Career Centre: 474 Univ. Ctr. 474-8592
- University of Manitoba Psychological Services Centre: 162A Dafoe Bldg. 474-9222
- Klinic 24-hour crisis line: 786-8686

Data anonymity and storage. The data you provide in this study is linked only by your UM email address. We need to keep your contact information (UM email) with the data until the end of the study so that we can invite you to the third part of the study and pair your responses across the three phases. The online data will be stored in a password-protected file accessible only to the Principal Investigator and Research Supervisor. The paper records will be kept under lock and key in the Research Supervisor's locked research laboratory. Once all data has been collected, the paper copies will be securely destroyed and the identifying aspect (UM email) will be stripped from the data file, rendering it anonymous. This means that no one, including the research assistant and principal investigator, will be able to link you with your data. Both processes are anticipated to occur by March/April 2015. Once the study data has been made anonymous, it will be maintained indefinitely on the Principal Investigator's research computer.

Participation credit. In exchange for your participating in this part of the study, you will receive **three (3) credits** toward your research-participation requirement for your Introduction to Psychology class. Credits will generally be forwarded to the Study Pool Coordinator for processing within two business days of participation. Please contact the Principal Investigator if you have any concerns related to receiving credit for your participation.

How to withdraw from the study. You may cease to participate altogether in the study at any time. Alternatively, you may also choose to not answer any question or complete any of the study measures that you choose. Neither of these actions will result in any negative

consequences. To cease your participation in the study simply inform the Principal Investigator and explain that you wish to be excused and provide him with your study materials. If you are in any way upset by the study procedures please discuss this with the Principal Investigator. The Principal Investigator will help ensure you receive any assistance you may require and will also ensure you receive credit for participation.

Debriefing. Once you have finished this study, the Principal Investigator will provide a debriefing. You will have the opportunity to discuss your experiences and ask the Principal Investigator any questions you may have. The counselling resources mentioned earlier in this consent form will be re-distributed at this point as well.

Dissemination of findings. The findings from this research will be presented in aggregate (group) form to psychology researchers and practitioners at psychology conferences and in a scientific peer-reviewed journal to researchers and other interested persons. Presentation of the study findings will not jeopardize the anonymity of your data.

Signed Consent. By checking "YES, I consent" below on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. If you do choose to withdraw from this study, we will destroy any data that you have provided and not include it in the analysis. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

_____ YES, I consent	_____ NO, I do not consent
Participant's signature: _____	Date: _____
Researcher and/or Delegate's signature: _____	Date: _____

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

If you have any questions about this research, feel free to phone or email the Principal Investigator (see above). This research has been approved by the Psychology/Sociology Fort Garry Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator (HEC) at 474-7122. A copy of this consent form has been given to you to keep for your records and reference.

Please provide your UM email address below. This will allow us to link participants' data across the three parts of this study. Thank you.

UM email address: _____

Sample Payout Matrix

Instructions: You are competing with another student in a multi-round mutual decision task. You and your opponent will earn points depending on each of your decisions to cooperate or compete. The payoff matrix for Players 1 and 2 is presented below. The four possible outcomes and payouts for each player is listed below the matrix.

Try to earn as many points as you can. All students will be entered in a draw following the study in which three students will receive a cash prize corresponding to how many points they earned (1 point = $0.10). For example, earning 250 points would correspond to a $25 cash prize. Good luck!

		Player 2	
		Cooperate	Compete
Player 1	Cooperate	10 points / 10 points	0 points / 12 points
	Compete	12 points / 0 points	1 point / 1 point

Outcome 1:

Both players cooperate ------------------------> Player 1: 10 points;   Player 2: 10 points

($1.00)   ($1.00)

Outcome 2:

Both players compete ------------------------> Player 1: 1 point;   Player 2: 1 points

($0.10)   ($0.10)

Outcome 3:

Player 1 cooperates ------------------------> Player 1: 0 points;   Player 2: 12 points

Player 2 competes ($0.00)   ($1.20)

Outcome 4:

Player 1 competes ------------------------> Player 1: 12 points;   Player 2: 0 points

Player 2 cooperates ($1.20)   ($0.00)

Writing Exercise (*Self-affirmation instructions*)

1. Using your ranked list, in the space provided below please write about why your **first-ranked** value or characteristic is important **to you**. If you require more space, please use the extra paper that is provided.

2. Please describe a couple of examples from your life when this value has proved meaningful. If you require more space, please use the extra paper that is provided.

Writing Exercise (*Control instructions*)

1. Using your ranked list, in the space provided below please write about why your **ninth-ranked** value or characteristic may be important **to the typical University of Manitoba student**. If you require more space, please use the extra paper that is provided.

2. Please describe a couple of examples when this value might have proved meaningful for a typical University of Manitoba student. If you require more space, please use the extra paper that is provided.

3. Please describe in detail how you got to the university today, including any streets or bus stops you may have used.

Self-Affirmation Manipulation Check

(Napper, Epton, & Harris, 2009)

Please complete the following questions based on your experience during this writing task.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5

_____ 1.   This exercise made me think about positive aspects of myself.

_____ 2.   This exercise made me focus my attention on who I am.

_____ 3.   This exercise made me aware of things I value about myself.

_____ 4.   This exercise made me think about things personally important to me.

_____ 5.   This exercise made me think about my values.

Mood Rating

Think about how you are feeling at this moment. Please make one vertical mark along the line

below to represent how you feel.

Terrible I--I Delighted

Note: Each visual analog scale will be separated on its own slip of paper so participants receive

only one at a time. Participants will complete mood measures at several points throughout phase

2 of the study.

Brief Intelligence Test (Johnson, 1991)

Numeric Sequences   Answer

No.						
1.	2	12	15	32	35	(___)
2.	36	28	24	22		(21)
3.	8	10	14	18	26	(___)
4.	5	12	23	40	71	(___)
5.	2	13	22	29	34	(37)
6.	9	15	22	39	46	(___)
7.	4	11	20	28	31	(___)
8.	4	6	9	14	23	(40)
9.	38	31	22	15	9	(___)
10.	14	17	23	38	49	(___)

Find the Odd-one-out Problems

No.						
1.	July	August	September	October	November	(___)
2.	house	igloo	bungalow	office	hut	(office)
3.	chariot	car	bus	wagon	truck	(___)
4.	herring	haddock	shark	barracuda	cod	(___)
5.	Byron	Shelley	Keats	Chamberlin	Wordsworth	(Chamberlin)
6.	dog	lion	tiger	fox	cat	(___)
7.	butterfly	wasp	bee	moth	housefly	(___)
8.	Jupiter	Apollo	Mars	Neptune	Mercury	(Apollo)
9.	canoe	rowboat	yacht	barque	junk	(___)
10.	Mozart	Bach	Chopin	Handel	Beethoven	(___)

Note. Correct answers for solvable questions are indicated in parentheses.

Post-test Estimate (on reverse side of Brief Intelligence Test)

1. How many items do you think you answered correctly (out of 20)? _____

Think about how you are feeling at this moment. Please make one vertical mark along the line below to represent how you feel.

Terrible I--I Delighted

Reactions to Test Feedback

Regarding your performance on the intelligence test, please complete the following questions.

_____ 1.   My test score accurately reflects my intellectual abilities.

_____ 2.   The results of this test are pretty important to me.

Note: Lower scores are thought to reflect greater defensiveness.

Think about how you are feeling at this moment. Please make one vertical mark along the line below to represent how you feel.

Terrible I---I Delighted

Payout Matrix

Instructions: You are competing with another student in a multi-round mutual decision task. You and your opponent will earn points depending on each of your decisions to cooperate or compete. The payoff matrix for Players 1 and 2 is presented below. The four possible outcomes and payouts for each player is listed below the matrix.

Try to earn as many points as you can. All students will be entered in a draw following the study in which three students will receive a cash prize corresponding to how many points they earned (1 point = $0.10). For example, earning 250 points would correspond to a $25 cash prize. Good luck!

		Player 2	
		Cooperate	Compete
Player 1	Cooperate	10 points / 20 points	0 points / 24 points
	Compete	12 points / 0 points	1 point / 2 points

Outcome 1:

Both players cooperate ------------------------> Player 1: 10 points;   Player 2: 20 points

($1.00)   ($2.00)

Outcome 2:

Both players compete ------------------------> Player 1: 1 point;   Player 2: 2 points

($0.10)   ($0.20)

Outcome 3:

Player 1 cooperates, 2 competes --------------------> Player 1: 0 points;   Player 2: 24 points

($0.00)   ($2.40)

Outcome 4:

Player 1 competes, 2 cooperates --------------------> Player 1: 12 points;   Player 2: 0 points

($1.20)   ($0.00)

Interpersonal Perceptions

This form is to be completed by the participant with the **lower** score:

Please rate each item as to the extent to which it accurately describes your feelings toward your opponent (X) after learning that he/she scored higher than you on the intelligence test.

Not Characteristic at All			Neutral		Extremely Characteristic	
1	2	3	4	5	6	7

_____ 1. <u>I lack some of the things X has.</u>

_____ 2. I feel admiration toward X.

_____ 3. I feel happy.

_____ 4. <u>I feel bitter.</u>

_____ 5. <u>I feel envious (of X).</u>

_____ 6. I feel a positive connection with X.

_____ 7. I feel ambivalent (*uncertain, hesitant*) toward X

_____ 8. <u>I have a grudge *(resentment, bitterness)* against X.</u>

_____ 9. I feel anxious

_____ 10. <u>I want to have what X has.</u>

_____ 11. <u>X has things going for him/her better than I do.</u>

_____ 12. I want to get to know X better as a person.

_____ 13. <u>I feel gall *(irritated, annoyed).*</u>

_____ 14. I feel trusting toward X.

_____ 15. <u>I feel some hatred toward X.</u>

_____ 16. <u>I feel rancor *(resentment, ill will)* toward X.</u>

_____ 17. I feel sanguine (*happy, optimistic*) toward X.

Note: Underlined items are from the Episodic Envy Scale (Cohen-Charash, 2009). The remaining filler items were created by the author to disguise the questionnaire's purpose.

Gift Distribution Questionnaire - Accept

Your opponent has proposed the following distribution for the $10 gift.

Player 1: _____($2.00)_____

Player 2: _____($8.00)_____

Why did you accept the offer? (Please answer in one sentence):

_____

_____

Do you have any comments for your opponent about his/her proposal for sharing

the $10 gift?

_____

_____

_____

Think about how you are feeling at this moment. Please make one vertical mark along the line

below to represent how you feel.

Terrible I---I Delighted

Please turn over page and complete questions on the reverse side.

How fair was your opponent's offer?

Very Unfair I---I Very Fair

At this moment, how do you feel about your opponent?

Strongly Dislike I---I Strongly Like

At this moment, how do you feel about yourself?

Strongly Dislike I---I Strongly Like

How intelligent is your opponent, as compared to the average U of M student?

Inferior I---I Superior

How intelligent are you, as compared to the average U of M student?

Inferior I---I Superior

Gift Distribution Questionnaire - Reject

Your opponent has proposed the following distribution for the $10 gift.

Player 1: _____($2.00)_____

Player 2: _____($8.00)_____

Why did you reject the offer? (Please answer in one sentence):

_____

_____

Do you have any comments for your opponent about his/her proposal for sharing

the $10 gift?

_____

_____

_____

Think about how you are feeling at this moment. Please make one vertical mark along the line below to represent how you feel. Terrible I--I Delighted

Please turn over page and complete questions on the reverse side.

Please rate each item as to the extent to which it accurately describes your feelings toward your opponent (X) after **rejecting** his/her gift offer.

Strongly Disagree			Neutral		Strongly Agree	
1	2	3	4	5	6	7

1. I was offended by X's offer .

     1   2   3   4   5   6   7

2. I felt good knowing that X had been 'brought down a level'.

     1   2   3   4   5   6   7

3. I resented X for his/her puny offer.

     1   2   3   4   5   6   7

4. I smiled a little, knowing that X wouldn't get his/her money.

     1   2   3   4   5   6   7

5. I secretly hoped to give X an experience of failure.

     1   2   3   4   5   6   7

How fair was your opponent's offer?

> Very Unfair I---I Very Fair

At this moment, how do you feel about your opponent?

> Strongly Dislike I---I Strongly Like

At this moment, how do you feel about yourself?

> Strongly Dislike I---I Strongly Like

How intelligent is your opponent, as compared to the average U of M student?

> Inferior I---I Superior

How intelligent are you, as compared to the average U of M student?

> Inferior I---I Superior

Coping with Challenging Situations

Experiences of envy can be among the most challenging situations we face in daily life. This emotion occurs when we feel at a disadvantage relative to others and lack something important. This might involve lacking a certain object (e.g., smartphone, Xbox One, expensive vehicle or clothing) attribute (e.g., intelligence, popularity), or accomplishment (e.g., academic or athletic award). These situations can often lead to feelings of anger, sadness, and perceptions that others' advantages are unfair. Certain strategies can be very effective in helping us cope, including:

1. **Try not to feel (too) angry**. While feeling angry is normal, too much anger can lead us to harm others or make bad decisions that end up hurting ourselves.

2. **Try not to feel sad or embarrassed.** Feeling sad or embarrassed are also normal, but too much of either can lead us to give up on important goals and feel even worse about ourselves.

3. **Keep at it!** The best goals are ones that we have to work at. You might not get what you want the first time, but you will probably get better with practice. You will often reach your goals if you are persistent.

4. **Learn from the best.** Someone else's success doesn't have to feel like your failure. Watching others who are more successful can help you learn new skills/techniques so you can improve your performance and do better next time. This is the opposite of what most people do in these situations - comparing ourselves to others who are worse off in order to feel better about ourselves - even though doing so doesn't actually help you improve.

*** *The next time you find yourself in a similar situation, consider using these strategies.***

Appendix D: Part 3 Measures

Consent Form - Part 3

UNIVERSITY OF MANITOBA

Study Title: Personality, values, intelligence and decision-making during a competitive task.

Principal Investigator: Mr. Darren Neufeld, Department of Psychology
                             (Phone and email contact provided here)

Research Supervisor: Dr. Ed Johnson, Associate Professor, Psychology
                          (Phone and email contact provided here)

Sponsors: University of Manitoba
                        Social Sciences and Humanities Research Council of Canada

This consent form, a copy of which you may print for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Purpose and eligibility. Darren Neufeld is conducting his Doctoral dissertation under the supervision of Dr. Ed Johnson. The purpose of this study is to examine how people's personality styles, personal values, and intelligence may influence their decision-making during a competitive multi-round mutual decision task. If you are 18 years of age or older you are eligible to participate in this study.

Procedures. If you agree to participate in this portion of the study, you will complete online ratings pertaining to your emotional and interpersonal experiences during the past month. This survey is anticipated to take 15-20 minutes to complete.

Benefits of participation. A direct benefit that you may obtain by participating in this study is a greater awareness of your cognitive and emotional experiences during the past month through the process of reflecting on your answers to the questions in this study. An indirect benefit of your participation is that by participating you are contributing to the advancement of scientific knowledge concerning the relationship of personality, values, and intelligence to decision-making.

Risks of participation. This portion of the study involves completing a variety of questions pertaining to interpersonal hassles and other negative emotional experiences over the past month. It is possible that reflecting on these circumstances may produce feelings of discomfort and stress and may be surprising or concerning. If you encounter any of these reactions or any other response that concerns you, remember that you are free to discontinue your participation in the study at any point without any negative consequences. If you do experience any kind of emotional upset or distress as a result of participating in this study and you wish to speak to a trained counselor about your experience, you may access any of the following free resources (below).

- University of Manitoba Student Counselling and Career Centre: 474 Univ. Ctr. 474-8592
- University of Manitoba Psychological Services Centre: 162A Dafoe Bldg. 474-9222
- Klinic 24-hour crisis line: 786-8686

Data anonymity and storage. The data you provide in this study is linked only by your UM email address. The online data will be stored in a password-protected file accessible only to the Principal Investigator and Research Supervisor. The paper records will be kept under lock and key in the Research Supervisor's locked research laboratory. Once all data has been collected, the paper copies will be securely destroyed and the identifying aspect (UM email) will be stripped from the data file, rendering it anonymous. This means that no one, including the research assistant and principal investigator, will be able to link you with your data. Both processes are anticipated to occur by March/April 2015. Once the study data has been made anonymous, it will be maintained indefinitely on the Principal Investigator's research computer.

Participation credit. In exchange for your participating in this part of the study, you will receive **two (2) credits** toward your research-participation requirement for your Introduction to Psychology class: one (1) credit for completing Part 3, and one (1) credit for completing all parts of this study. Credits will generally be forwarded to the Study Pool Coordinator for processing within two business days of participation. Please contact the Principal Investigator if you have any concerns related to receiving credit for your participation.

How to withdraw from the study. You may cease to participate altogether in the study at any time. Alternatively, you may also choose to not answer any question or complete any of the study measures that you choose. Neither of these actions will result in any negative consequences. To cease your participation in the study simply contact the Principal Investigator by email or phone and simply explain that you wish to be excused and provide him with your study materials. If you are in any way upset by the study procedures please discuss this with the Principal Investigator. The Principal Investigator will help ensure you receive any assistance you may require and will also ensure you receive credit for participation.

Debriefing. A short written debriefing will follow your participation in this portion of the study and will provide a summary of all aspects of this study. You will be encouraged to contact the Principal Investigator to answer any questions you may have.

Dissemination of findings. The findings from this research will be presented in aggregate (group) form to psychology researchers and practitioners at psychology conferences and in a scientific peer-reviewed journal to researchers and other interested persons. Presentation of the study findings will not jeopardize the anonymity of your data.

Study feedback. A brief (1-3 page) summary of the study results in aggregate form will be provided to you approximately 4 to 6 weeks after the completion of data collection via email (approximately May 2015). If you would like to receive feedback, please click the box "YES, I would like to receive a summary of the results" below.

_____ YES, I would like to receive a summary of the results

Signed Consent. By clicking "YES, I consent" below on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. If you do choose to withdraw from this study, we will destroy any data that you have provided and not include it in the analysis. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

_____ YES, I consent   _____ NO, I do not consent (exit)

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

If you have any questions about this research, feel free to phone or email the Principal Investigator (see above).   This research has been approved by the Psychology/Sociology Fort Garry Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator (HEC) at 474-7122. You are encouraged to print a copy of this consent form for your records and reference; it will not be available later except by request.

Please provide your UM email address below. This will allow us to link participants' data across the three parts of this study. Thank you.

UM email address: _____

Experiences Over the Past Month

Approximately one month ago, you participated in a study looking at how people manage difficult situations involving envy where one feels disadvantaged relative to someone else. Everyone experiences this emotion from time to time. These situations can often lead to feelings of anger, sadness, and perceptions that others' advantages are unfair. These emotions arise when someone has something that want, but don't possess ourselves.

There is a wide range of things we might feel envious about. For example, you may feel envious because someone else has a newer or more expensive smartphone, vehicle, or clothing. Alternatively, you may feel envy toward another person who is more attractive or intelligent than you. You may also feel envy toward someone who has accomplished something that you didn't, such as a higher exam grade or an award.

With this in mind, please complete the following questions.

1.   Thinking back to the most intense situation involving envy over the past month, please provide a brief description of a) what happened, b) who you compared yourself to, c) how you were disadvantaged, and d) how you felt about it.

A) What happened:
_____
_____
_____

B) Who did you compare yourself to?
_____
_____
_____

C) How you were disadvantaged?
_____
_____
_____

D) How did you feel about it?
_____
_____
_____

2.   In this same situation, how intensely did you feel each of the following emotions relative to whoever had this important advantage?

Not at all		Somewhat intensely		Very intensely
0	1	2	3	4

A.   Angry

    0   1   2   3   4

B.   Admiring

    0   1   2   3   4

C.   Hostile

    0   1   2   3   4

D.   Sad

    0   1   2   3   4

E.   Inferiority

    0   1   2   3   4

F.   Resentment

    0   1   2   3   4

G.   Upset because the situation was unfair

    0   1   2   3   4

3.   To what extent did you use any of the following strategies to cope with these feelings?

Not at all	Very little	Somewhat	Quite a bit	Very much
0	1	2	3	4

A.   Try not to feel too angry

    0   1   2   3   4

B.   Try not to feel sad or embarrassed

    0   1   2   3   4

C.   Keep working toward your goals and improving (increasing your motivation/effort)

    0   1   2   3   4

D.   Learning from others who are better off

    0   1   2   3   4

4.   (For any items answered "1" or higher): To what extent was each strategy effective in helping you cope with these feelings?

Not at all	Very little	Somewhat	Quite a bit	Very much
0	1	2	3	4

A.   Try not to feel too angry

    0   1   2   3   4

B.   Try not to feel sad or embarrassed

    0   1   2   3   4

C.   Keep working toward your goals and improving (increasing your motivation/effort)

    0   1   2   3   4

D.   Learning from others who are better off

    0   1   2   3   4

5.   Did you use any other strategies to manage feelings of envy? If so, please describe the strategy/strategies below:

_____
_____
_____
_____

6. In the past month, how many of these types of situations have you experienced (circle)?

    A. 0   B. 1-2   C. 3-4   D. 5-6   E. 7-8   F. 9+

Hassles Assessment Scale for Students in College (Sarafino & Ewing, 1999)

Instructions: The items below describe circumstances you may sometimes find unpleasant if they make you frustrated, irritated, or anxious. Think of them as events - they happen and end. Consider your experiences in the **past month.** For each event, provide a rating to describe its **frequency,** the **degree of unpleasantness** it usually produced for you, and the extent to which you **dwelled** on or were bothered by it when the actual event was not present (before or after). **Use all three** rating scales which are defined below.

Rating Scale Definitions:

FREQUENCY: Rate **how often** in the **past month or so** the event occurred, using a scale that ranges from **0** = "never" to **5** = "extremely often."

UNPLEASANTNESS: Rate **how unpleasant** the event usually was when it actually happened, using a scale that ranges from **0** = "not at all" to **4** = "extremely" unpleasant. Mark **0** if the event didn't occur.

DWELLED: Rate the **extent to which you usually were bothered** by each event when it was not actually present, before or after it occurred. Use a scale from **1** to **5**, where **1** means you dwelled on it either *not at all* or *very little* (thinking about it *briefly* for *less than an hour*) and **5** means you dwelled on it *very often and for more than a week*. Mark **1** if the event didn't occur.

Frequency:

Never	Rarely	Occasionally	Often	Very Often	Extremely Often
0	1	2	3	4	5

Unpleasantness:

Not at all	Mildly	Moderately	Very	Extremely
0	1	2	3	4

Dwelled:

Very little/ not at all	Somewhat	Moderately	A lot	A great deal
1	2	3	4	5

1. Annoying social behavior of others (e.g., rude, inconsiderate, sexist/racist)

2. Annoying behavior of self (e.g., habits, temper)

3. Appearance of self (e.g., noticing unattractive features, grooming)

4. Accidents/clumsiness/mistakes of self (e.g., spilling beverage, tripping)

5. Athletic activities of self (e.g., aspects of own performance, time demand)

6. Bills/overspending: seeing evidence of

7. Boredom (e.g., nothing to do, current activity uninteresting)

8. Car problems (e.g., breaking down, repairs)

9. Crowds/large social groups (e.g., at parties, while shopping)

10. Dating (e..g, noticing lack of, uninteresting partner)

11. Environment (e.g., noticing physical living or waking conditions)

12. Extracurricular groups (e.g., activities, responsibilities)

13. Exams (e.g., preparing for, taking)

14. Exercising (e.g., unpleasant routines, time to do)

15. Facilities/resources unavailable (e.g., library materials, computers)

16. Family: obligations or activities

17. Family: relationship issues, annoyances

18. Fears of physical safety (e.g., while walking alone, being on a plane or in a car)

19. Fitness: noticing inadequate physical condition

20. Food (e.g., unappealing or unhealthful meals)

21. Forgetting to do things (e.g., to tape TV shows, send cards, do homework)

22. Friends/peers: relationship issues, annoyances

23. Future plans (e.g., career or marital decisions)

24. Getting up early (e.g., for class or work)

25. Girl/boy-friend: relationship issues, annoyances

26. Goals/tasks: not completing enough

27. Grades (e.g., getting a low grade)

28. Health/physical symptoms of self (e.g., flu, PMS, allergies, headache)

29. Schoolwork (e.g., working on term papers, reading tedious/hard material, low motivation)

30. Housing: finding/getting or moving

31. Injustice: seeing examples or being a victim of

32. Job: searching for or interviews

33. Job/work issues (e.g., demands or annoying aspects of)

34. Lateness of self (e.g., for appointment or class)

35. Losing or misplacing things (e.g., keys, books)

36. Medical/dental treatment (e.g., unpleasant, time demands)

37. Money: noticing lack of

38. New experiences or challenges: engaging in

39. Noise of other people or animals

40. Oral presentations/public speaking

41. Parking problems (e.g., on campus, at work, at home)

42. Privacy: noticing lack of

43. Professors/coaches (e.g., unfairness, demands of, unavailability)

44. Registering for or selecting classes to take

45. Roommate(s)/housemate(s): relationship issues, annoyances

46. Sexually transmitted diseases (e.g., concerns about, efforts to reduce risk of STDs/HIV)

47. Sports team/celebrity performance (e.g., favorite athlete or team losing)

48. Tedious everyday chores (e.g., shopping, cleaning apartment)

49. Time demands/deadlines

50. Traffic problems (e.g., inconsiderate or careless drivers, traffic jams)

51. Traffic tickets: getting (e.g., for moving or parking violations)

52. Waiting (e.g., for appointments, in line)

53. Weather problems (e..g, snow, heat/humidity, storms)

54. Weight/dietary management (e.g., not sticking to plans)

Appendix E: Experimental Script

(Note: nonverbal directions are italicized).

Both participants will enter the lab room. They will be seated on either side of a partition, intended to minimize communication.

"Welcome to the (study name) study on the relationship between personality, intelligence, values, and mutual decisions. In a short time you will both be participating in a mutual decision game in which you can earn points across multiple rounds. The number of points you earn in each round is determined by the collective decisions made by you and your opponent. Try to earn as many points as you can because when the study is finished, three randomly chosen participants will be contacted to receive a cash payout corresponding to the number of points they earned during the game. Each point is worth $0.10. As an example, earning 250 points would correspond to a $25 cash prize."

*Pass out **Sample Payout Matrix***

"Here is a sample payout matrix for the game. As you can see on this sheet, you have the choice to cooperate with your opponent, or to try to "take" some extra earnings from them in each round. Be aware that your opponent may do the same thing to you. Looking at the examples below, if both players choose to cooperate, Player A and Player B both earn 10 points (worth $1). If neither player cooperates, both earn only one point each (worth $0.10).

Now let's imagine that Player A cooperates but Player B "takes." If this happens, Player A receives nothing but Player B receives 12 points (worth $1.20). If Player A "takes" and Player B cooperates, these payouts are reversed.

Any questions so far?

As we are interested in your experience throughout this study, I will regularly ask you to make a rating of your mood."

*Pass out **Mood Rating** paper slip.*

"As you can see, the mood rating scale ranges from "terrible" to "delighted" at opposite ends of a line. Please mark a tick somewhere along that line corresponding to how you feel at this moment. Don't give it too much thought, just rate how you're feeling right now. Please make your first rating now."

*Separate participants by moving one student to the adjacent lab room. Give this participant an envelope containing the **Ranking of Personal Characteristics and Values** and a **Writing Exercise (self-affirmation or control).***

"Please complete the following writing task. Once you are finished, please place the papers back in the envelope and open the door to the hallway to let me know you are finished."

Return to Room A, give participant an envelope of containing the essay instructions (self-affirmation or control) and repeat instructions (above). While participants complete the value essay, wait in the hallway between the two rooms. Record completion times for both participants. When the first participant has finished, collect the envelope.

(Note: If a participant has not completed the essay in 15 minutes, enter the room and say:

"Please start wrapping up your essay in the next minute or two.")

"Thanks. Now please complete these forms." (*Distribute **Self-affirmation Manipulation Check** and **Behavior Identification Form [Part 2]** in a second envelope).*

"Once you are finished, please place the papers in the envelope and open the door to the hallway to let me know you are finished. The next part of the study will begin shortly."

*Enter room of participant who finished these forms **first** (hereafter referred to as Room 1) and say the following:*

"Before we get started, I would like you to complete a brief intelligence test. This test is able to accurately estimate individuals' intelligence and their likely academic performance in university, based on their performance on two tasks. That is, the better a person does on this test, the more likely he or she is to achieve higher grades in university. This test has been extensively researched and validated in numerous studies. The purpose of our present research is to collect data on how intelligence relates to aspects of personality, values, and success in mutual decision tasks.

In the first task, you will be given a set of 10 numerical problems. You will be required to complete the sequence by identifying the number that correctly follows the numbers listed. For example, if the sequence is '1...3...5...7...9' the next number would be 11 because the sequence increases by 2 each time. *Hold up card to illustrate this example.*

The second task involves 10 'find-the-odd-one-out' word problems. You will be required to identify one word which does not fit in with the rest (e.g., cake, carrot, potato, celery, radish). *Hold up card to illustrate this example.* The correct answer for this would be cake, as it is the only word that is not a vegetable.

The items vary in difficulty, with some being very easy and some being quite difficult. Every question has a correct response. If you have any questions, please ask them now. You will have up to 30 seconds to complete each item. I will let you know when you have 10 seconds remaining.

*Distribute **Intelligence Test** and writing utensil; administer test.*

(When time is up): Please turn the test over and estimate how many items you answered correctly and make a mood rating (**Post-test Estimate**)."

Collect and quickly score the participant's test. Be familiar with the correct answers (there are 6 items that can be answered correctly) and put a checkmark by these items; at least 3 items will receive checkmarks. If less than 3 of the solvable items were answered correctly, mark up to 3 of the unsolvable ones as correct. The participant will not view the page, but will be able to see the experimenter scoring the test.

Any questions about correct answers to particular items or suspicions about unsolvable items will be redirected (e.g., "I'm sorry, I'm not able to provide any feedback on the test items; All items on this test are solvable; some items are quite difficult").

"Your performance was X (insert # of correct responses from 3-6 correct) places you in the 45th %ile, which is just below average. Meanwhile, your opponent scored 24 out of 30 correct which is 85th percentile and well above average. Because your opponent scored higher than you on the intelligence test, (s)he will have an advantage in the upcoming mutual decision game. We are going to be using the following payoff matrix, which is different from the one I showed you earlier as an example."

*Pass out **Payoff Matrix.***

"Since your score was lower, you will play as Player A and your opponent will play as Player B. As you can see from the matrix, your opponent will earn more points than you in most of the possible outcomes. For instance, if you both cooperate, you earn 10 points while your opponent earns 20. I will keep track of points for you and your opponent on the white board in front of you. We will start the game in a few minutes; in the meantime, please complete the following

questionnaire. As the lower scorer on the intelligence test, you will complete this version of the test."

*Distribute **Interpersonal Perceptions** form; the payoff matrix will remain in front of the participant.*

*Go to Room 2 and repeat the instructions/procedure with the second participant: administer the intelligence test, provide the false performance feedback, have the participant complete the **Post-Test Estimate** items, and introduce and distribute the **Payoff Matrix, Interpersonal Perceptions** and **Post-test Estimate**. Return to Room 1.*

"Thank you for your patience."

Collect the Interpersonal Perceptions and Post-test Estimate forms.

"We are going to start the first round now. We will proceed by you deciding whether to cooperate or take, and then I will go to the next room to record your opponent's choice. Both of your earnings will be determined by the combination of your choices, and I will record your scores on the white board. We will repeat this process for each round. What is your decision for Round 1?"

*Go to Room 2 and repeat instructions for participant; collect the **Intelligence Test/Post-Test Estimate** and **Interpersonal Perceptions** forms.. Return to Room 1.*

"Your opponent chose to cooperate in Round 1. As a result, you will earn (insert # of points) points while your opponent will earn (insert # of points)." *Record points on white board.*

"What is your decision for (Round 2, Round 3, Round 4, ...Round 20)?"

*Alternate between the two lab rooms until 20 rounds have been completed, updating the scores on the white board after each round. Distribute a **Mood rating** slip of paper* ("Please make a mood rating now"*) and ask each participant to make a rating following rounds 5, 10, and 15.*

*After round 20, distribute **Interpersonal Perceptions** questionnaire to the participant in Room 1*

"Please complete this form." *Distribute form to participant in Room 2.*

Collect form once participant in Room 1 is finished.

"In addition to the chance you have to win your points as a cash payout - you have X points and would earn $(X/10) - we want to thank you both for participating in this study by offering a $10 cash gift that you and your opponent will share. Because your opponent has the higher score, (s)he will get to decide how to divide the $10 and you will get to decide whether to accept or reject the offer. If you accept, you each get the amount of money that he/she proposed. If you reject, neither of you receive anything. Any questions?"

Go to the Room 2 and repeat this procedure. Return to Room 1.

"Your opponent has proposed that he/she keep $8 and has offered you $2. If you accept the offer, each of you will receive the amount of money he/she proposed. If you reject the offer, neither of you receives any money. What is your decision?"

(*If offer is accepted*: "Ok, you and your opponent will receive your share of the $10 gift at the conclusion of the study. Now please complete the following form." *Distribute **Gift Distribution Questionnaire - Accept**).*

(*If offer is rejected:* "Ok, you and your opponent will not receive a share of the $10 gift. Now please complete the following form." *Distribute **Gift Distribution Questionnaire - Reject**).*

Return to Room 2 and repeat this procedure. In addition, say the following:

"Once you have completed this form, please place it in the envelope in front of you and work on these materials until I return."

Distribute a package containing a Sudoku and crossword puzzle to the participant in Room 2.

This is intended to reduce boredom while the participant waits for the participant in Room 1 to

be debriefed.

Return to Room 1. Collect the completed questionnaire. Debrief the participant using the

debriefing script. Thank and pay the participant $2.

"There is one last thing I'm going to ask you to do before you leave. My advisor and I are soon

going to be looking how high school students handle difficult interpersonal situations in a future

study. We have prepared a short write-up outlining some strategies that we think may prove

helpful. Please take two minutes to review this write-up and providing a couple of ratings on the

quality of the information. Once you have read through and made your ratings, you are free to

go. Thanks again for your participation. You will receive an emailed link to participate in Part 3

in approximately one month's time.

*Distribute **Coping with Difficult Situations** form.*

*Return to Room 2. Repeat the debriefing and payment. Distribute **Coping with Difficult***

***Situations** form.*

Appendix F: Debriefing Script

Thank you for participating in today's study. We have now finished the formal part of the testing and I would like to know more about your experience throughout this study. Feel free to say as much or as little as you would like.

Funneled debriefing questions (Responses were recorded by the experimenter):

- What do you think the purpose of the experiment was?

- How did you find the writing task? The intelligence test? The mutual decision game?

- Did you think that any of the tasks you did were related in any way?

    o If "yes": In what way were they related?

- Did anything you did on one task affect what you did on any other task?

    o If "yes": How exactly did it affect you?

- When you were completing the intelligence test, did you notice anything unusual about the items?

    o If "yes": What did you notice?

- Did you notice any particular pattern in the responses that your opponent made during the mutual decision task?

    o If "yes": What pattern did you notice?

- What were you trying to do during the mutual decision task? Did you have any particular goal or strategy?

    o If "yes": What goal/strategy did you use?

        As you may have suspected, there was more to this study than you have been told so far. The main hypothesis in this study was that writing about an important personal value would help

participants cope with an important self-threat - negative feedback about one's intelligence - and experience less envy toward an advantaged opponent. This process of writing about or reflecting on important personal values is known as self-affirmation. Elsewhere, it has been shown to make people less defensive toward a variety of threats and more likely to make beneficial changes in their lives.

In the present study, we hypothesized that self-affirmation would lead participants to report lower feelings of envy, play more cooperatively during the mutual decision task, make more balanced judgments toward oneself and the opponent, and exhibit less defensiveness toward feedback on the test.

You may have noticed that the intelligence test was very difficult. In fact, the test does not predict intelligence or academic success and was designed so that every participant would feel as if he/she had done very poorly. Seventy percent of the items in the test are unsolvable. Also, I did not score either of your tests. Instead, I told each of you that you scored below average, while your opponent in the next room supposedly scored well above average. I want to assure you that this test in no way reflects your actual intelligence. You should be aware that some participants may feel bad about themselves even after learning that negative feedback about their performance isn't true. If this occurs, I encourage you to remind yourself that the test does not really measure intelligence and that the unsolvable items were meant to make participants believe they had performed poorly, even though there is no correct answer. I apologize for misleading you; this was necessary because we needed to create a situation where you might feel envious toward an advantaged opponent - one who you were led to believe is smarter than you and would receive more points than you.

Questions:

- How did you find the intelligence test? Did you experience any strong emotions while

  writing the test?

- How did you feel toward your opponent when you learned he/she scored higher than you?

Because both of you were told that you scored lower than your opponent on the intelligence test, you didn't actually play against each other during the mutual decision task. In fact, you played against a pre-set strategy: your "opponent" repeated whatever decision you made in the previous round. If you cooperated, the strategy cooperated. If you defected, the strategy defected. We used this game because participants tend to play differently when they feel envy toward an opponent, tending to defect often and cooperate very little. Nearly everyone who plays the game tends to cooperate and defect to some degree. Regardless of the decisions you made during the game, you need to know that you participated in a game that was set up to be somewhat unfair (as you received fewer points than your opponent) so as to encourage feelings of envy toward your opponent.

Questions:

- How did you find the mutual decision game? Did you experience any strong emotions while

  playing the game?

- How did you feel about your opponent during the game?

Regarding the gift distribution at the end of the game, both of you were told that your opponent proposed that he/she keep $8 and offered you only $2. The offer wasn't made by your opponent in the opposite room. In fact, your opponent was told that you had offered him/her $2. We added this decision to the study as we thought that self-affirmation may help participants accept an offer that gives them some small benefit, even if an opponent benefits far more. We

also asked you some questions about why you made the decision you did, as well as how you felt

about yourself and your opponent.

Regardless of whether you accepted or rejected the offer, each of you will receive $2

upon leaving today's study. You will also be entered in a drawing to win a cash prize

corresponding to the number of points you earned in today's study.

Questions:

- What was your experience like when you learned about the offer supposedly proposed by

  your opponent? What did you think about your opponent or of his/her offer?

In addition to seeing whether self-affirmation reduces participants' experience of envy,

we were also interested in finding out why self-affirmation may reduce envy as well as who may

be most likely to benefit from self-affirmation. In the first regard, we looked at whether writing

about an important (versus unimportant) value helps people make a mental shift from viewing

events in a concrete, detail-oriented way to a more abstract, big-picture perspective. A threat

such as another student's superior intelligence or monetary earnings might not matter so much if

one considers a value that is really important in one's life. In the second regard, there is some

research suggesting that individuals with lower levels of self-esteem or who have higher levels of

narcissistic traits might be more likely to benefit from self-affirmation, since they might have

fewer psychological resources to draw upon when faced with threat.

In summary, many of the feelings and reactions you may have experienced toward

yourself and your opponent in this study were created by the way the study was set up. We tried

to create a situation where you would feel envious of a smarter, advantaged student, although in

fact you never competed with this student during the experiment. I want to sincerely apologize

for the use of deception in this study. I hope that after explaining the full purpose of today's study

you can see why this was necessary: if participants knew that the intelligence test was bogus and they weren't competing against another student, they would likely behave very differently in the study and the results would be invalid. We wanted our experiment to induce strong feelings of envy since we want to know whether self-affirmation may be an effective treatment strategy in helping individuals who regularly experience envy. Additionally, I hope that by spending the time to explain the study's purpose and giving you the opportunity to share your experience throughout that this has been an opportunity for you to learn more about experimental research and resolve any feelings of discomfort or distress. I want you to feel positive about yourself and your participation in this study. If you notice that you continue to feel discomfort or distress arising as a result of your participation in this study, I have compiled a list of some free community resources that you can contact. Additionally, I encourage you to contact either myself or my research supervisor, Dr. Ed Johnson, if you have any concerns.

Final Question:

- Do you have any thoughts about how this study could be improved? Is there anything else you would like to share about your experience during this study?

Finally, I would please ask you to not mention anything about this study to other students who may participate in this study because this would likely affect how they behave during this study. Thanks again for participating, and here is your $2. *Pay participants $2.*