EMBODIED CAPITAL, ENVY, AND RELATIVE DEPRIVATION

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Abstract

Inequality causes feelings of relative deprivation and envy. Inequality has almost exclusively been examined as an environmental variable, characterized by skewed distribution of resources; however, inequality can also manifest through individual differences in traits such as intelligence, strength, and attractiveness. These innate qualities aid in successful social competition and are collectively referred to as embodied capital. Mishra, Barclay, and Sparks (2017) posit that both environmental and embodied factors influence an individual’s relative state – their assessment of their competitive (dis)advantage. This study examined whether low embodied capital is associated with feelings of relative deprivation and envy. Participants (n = 198) attending a lab session completed several self-report measures indicating feelings of personal relative deprivation and envy, as well as self-perceptions of embodied capital and self-efficacy. Additionally, participants had their strength, intelligence, body fat percentage, muscle percentage, coordination, and height assessed through objective measurements. The results indicate that objective and subjective indices of embodied capital are intermittently significant predictors of feelings of envy and personal relative deprivation. Moreover, the effects of objective and perceived embodied capital generally lost their significance once measures of self-efficacy were introduced to predictive models. In summary, the results of this study indicate a significant impact of embodied capital on feelings of disadvantage, with a substantial portion of this effect being subsumed under self-efficacy. Future research on inequality, competition, and feelings of disadvantage will likely benefit from considerations of individuals’ embodied capital and the psychology of relative state more broadly.
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1.0 Literature Review

The consequences of envy and personal relative deprivation are nearly uniformly negative. The costs imposed by such feelings on individuals, organizations, and societies suggest that we must understand their underlying causal mechanisms. Envy and feelings of personal relative deprivation can most accurately be described as responses to victimization by inequality. Inequality has historically been defined as a skewed distribution of desired outcomes or resources such as money, prestige, or romantic partners; however, inequality can manifest in forms beyond these extrinsic outcomes. Humans differ significantly in traits and abilities that facilitate effective social competition; for example, there is inequality in who is smart, strong, attractive, and charming. Traits and abilities influencing successful social competition, referred to as embodied capital, are important predictors of who will gain access to contested outcomes and resources (Bourdieu, 2011; Kaplan, 1996; Kaplan & Gangestad, 2005; Kaplan, Gurven, & Winking, 2009; Lalumière, Harris, Quinsey, & Rice, 2005; von Rueden, Lukaszewski, & Gurven, 2015). Given the importance of embodied capital in attaining envy-inducing outcomes, social comparisons should be attuned to one’s own competitive ability relative to others. The current study will test the hypothesis that individuals with low embodied capital will experience more envy and relative deprivation.

Research evidence to date suggests humans generally have adverse reactions to perceived victimization by inequality. Individuals are more likely to report lower life satisfaction if they made less money than their co-workers (Frank, 1999). Half of individuals prefer less purchasing power in order to have more money relative to peers (Solnick & Hemenway, 1998). Experimental evidence also demonstrates that victims of
inequality engage in more gambling and spiteful behaviours (Callan, Ellard, Shead, & Hodgins, 2008; Mishra, Son Hing, & Lalumière, 2015; Wobker, 2015). Even children resort to spiteful behaviours when they are worse off than their peers (Steinbeis & Singer, 2013).

1.1 Relative Deprivation Theory

Relative deprivation theory (Stouffer et al., 1949) is a key framework for describing and predicting how people react to inequality and disadvantage. An experience of relative deprivation has three steps. First, an individual makes a comparison (to either their past/future state, other individuals, or other groups). Second, the individual in question to perceives that they are at a disadvantage. Third, the perceived disadvantage is viewed as unfair, leading to angry resentment (Smith, Pettigrew, Pippin, & Bialoseiwicz, 2012). Relative deprivation theory has challenged the conventional wisdom that absolute deprivation (i.e., poverty) is of prime importance for understanding social functioning.

Relative deprivation was conceived as a post-hoc explanation for anomalies in soldier behaviours and preferences during World War II. For example, researchers found evidence that Military Police were more satisfied despite their slow promotions than Air Corpsmen were with their rapid promotions (Stouffer et al., 1949). The researchers speculated the discrepancy was due to the immediacy of comparisons; specifically, Military Police were satisfied with their promotion speed because Military Police members compared within their own ranks, instead of making comparisons with the Air Corpsmen whom the Military Police rarely encountered. The dissatisfaction of objectively privileged individuals reveals that relative deprivation is a subjective, not objective, experience. Satisfaction can be relative to available and salient comparisons;
even individuals in the highest ranks of society can experience relative deprivation depending on their reference groups (Smith et al., 2012).

Attributions of deservingness are also central to the experience of relative deprivation. Deservingness is based on a balance principle: positive actions deserve positive results and negative actions deserve negative results (Feather, 1999). Reminiscent of equity theory (Adams, 1965), a discrepancy between an individual’s actions and their outcomes is interpreted as undeserved (e.g., someone’s payment not adequately compensating their time and effort). Overall, perceptions of deservingness are inversely associated with anger, resentment, and schadenfreude – the feeling of pleasure at someone else’s expense (reviewed in Feather, 2006, 2015).

Judgments of deservingness are heavily informed by the perception of control; thus, attributions of control are central to relative deprivation theory. Crosby (1976) asserted that feelings of relative deprivation can only occur when the individual does not blame him/herself for their undesirable position. However, Beshai, Mishra, Meadows, Parmar, and Huang (2017) found that the relationship between feelings of personal relative deprivation and depressive symptoms were fully mediated by automatic negative thoughts about the self. These results indicate that individuals who feel personal relative deprivation can attribute their disadvantage to personal shortcomings, rather than solely blaming external forces, contradicting Crosby’s (1976) assertion. Since its conception, relative deprivation theory has been, and continues to be, expanded.

Runciman (1966) posited that relative deprivation can be experienced both as an individual and as a member of a social group. The distinction between personal and group-level relative deprivation produced two lines of research: 1) how individual-level
relative deprivation is associated to internal states (e.g., stress, depression, health) and
individual behaviour (e.g., absenteeism, bullying, drug use); and 2) how group-level
relative deprivation is linked to intergroup attitudes (e.g., stereotyping, nationalism, in-
group identification) and collective behaviours (e.g., approving violent politics, signing
petitions, joining strikes; Smith et al., 2012). The effects of relative deprivation can be
pervasive. Group relative deprivation has been associated with racist voting behaviours in
the United States (Vanneman & Pettigrew, 1972) and prejudice against individuals
immigrating into Europe (Pettigrew et al. 2008; Pettigrew & Meertens, 1995). Individual
feelings of relative deprivation have also been associated with poorer mental and physical
health, stress, a widespread pattern of risk-acceptance, lower reported conscientiousness,
extraversion, agreeableness, emotional stability, honesty/humility, self-control, and
higher impulsivity and sensation-seeking (Callan, Kim, & Matthews, 2015b; Mishra &
Carleton, 2015; Mishra & Novakowski, 2015; Novakowski & Mishra, under review).
Relative deprivation has predicted other social psychological outcomes such as social
protest, prejudice, and delinquency (Smith et al., 2012).

1.2 Envy

Relative deprivation has substantial convergence with theoretical work
surrounding envy. Envy is broadly defined as a painful feeling of inferiority, hostility,
and resentment when another person or group has a desired advantage (reviewed in Smith
& Kim, 2007). Envy is an unpleasant experience, being associated with neural activation
of the anterior cingulated cortex, which processes cognitive conflict and social pain
(Eisenberger, Lieberman, & Williams, 2003; Kerns et al., 2004; Singer et al., 2004).
Until recently, envy has been formally studied as a unitary construct, known as *envy proper*. However, the unitary conceptualization of envy cannot account for instances where envious individuals do not experience hostility, and are instead motivated to improve their own standing (e.g., van de Ven, 2017). A dual pathway model of envy has largely resolved these issues surrounding envy proper; malicious and benign envy describe two diverse ways in which people react to their feelings of envy. Benign and malicious envy are both rated as highly unpleasant experiences (van de Ven, Zeelenberg, & Pieters, 2009), but can be distinguished by underlying motivational and affective tendencies. *Malicious envy* includes hostility towards the envied individual and action tendencies designed to damage their position. *Benign envy* consists of positive regard for the advantaged individual and attempts to improve one’s own position. Lange and Crusius (2015) have found that envy proper is strongly positively correlated with dispositional malicious envy, but has no relationship with dispositional benign envy. These results suggest that what has been traditionally studied as envy proper approximates malicious envy more so than benign envy, with benign envy being a relatively novel reaction to disadvantage.

Deservingness plays a key role in distinguishing malicious from benign envy. Malicious envy is more likely to occur in situations where the advantaged person’s position is perceived as undeserved; conversely, benign envy is more likely to occur when the advantaged person’s position is perceived as highly deserved. Perceptions that one has control over their disadvantage can also lead to more benign envy, but only when the envied person’s advantage is deserved (van de Ven, Zeelenberg, & Pieters, 2012). Malicious and benign envy can also be distinguished from resentment and admiration,
two other social comparison reactions. Malicious envy is produced by perceptions of an unfair environment, whereas resentment is elicited when unfairness is the product of an individual’s willful behavior (van de Ven et al., 2012). Admiration, as opposed to benign envy, occurs when a social comparison does not reflect poorly on the observer. Benign envy can be further distinguished from admiration by a sense of control; individuals are more likely to feel benign envy than admiration when they feel they can control their situation (van de Ven et al., 2012). The extant evidence is suggestive that benign and malicious envy are distinct constructs from each other as well as other social comparison reactions.

Envy, like relative deprivation, is associated with a wide range of outcomes. Envy proper has been associated with spiteful behaviours (Wobker, 2015) and deviant workplace behaviours (Kim, Jung, & Lee, 2013). Malicious envy has been associated with less cooperation (Parks, Rumble, & Posey, 2002), greater fear of failing, avoidance in goal-setting (Lange & Crusius, 2015), an attentional bias towards an envied person rather than an envied object (Crusius & Lange, 2014), an intention to harm an envied individual (van de Ven et al., 2012), and avoidance of normative envy-inducing consumer products (van de Ven, Zeelenberg, & Pieters, 2011a). Benign envy is associated with greater hope for success, more ambitious goal-setting (Lange & Crusius, 2015), an attentional bias towards means to improve (Crusius & Lange, 2014), increased persistence and performance (van de Ven, Zeelenberg, & Pieters, 2011b), and an increased willingness to pay for envy-inducing consumer products (van de Ven et al., 2011b). The extant research suggests that envy has a substantial influence on individual outcomes.
1.3 Relative Deprivation and Envy as Social Comparison Reactions

Relative deprivation and envy come from very different fields. Relative deprivation was originally conceived as a sociological construct, whereas envy was conceived as a purely psychological construct. The segregation of psychology and sociology has resulted in the absence of investigations testing the overlap between envy and personal relative deprivation. Envy is seldom discussed as a factor influencing societal outcomes and there has not been an investigation concerning the psychological mechanisms of relative deprivation. Envy and relative deprivation have another key conceptual difference in that envy appears to have distinct malicious and benign forms, while relative deprivation has only been considered as a unitary construct (Crusius & Lange, 2015; Smith et al. 2012; van de Ven et al., 2009). The role of deservingness is also different for envy and relative deprivation. Relative deprivation must derive from perceptions of unfairness (Smith et al., 2012). Envy proper might not require perceptions of undeservingness, but instead motivate individuals to fabricate or exaggerate evidence of unfairness to justify their envy to themselves and, more importantly, to third party observers (Smith & Kim, 2007). A perception of another’s deservingness is a positive predictor of benign envy, but a negative predictor of malicious envy (van de Ven et al., 2009). No empirical work exists testing whether feelings of relative deprivation are associated with any form of envy, but relative deprivation may be analogous to envy proper or malicious envy.

Despite differences in origins, number of factors, and the role of deservingness, feelings of individual relative deprivation and envy both appear to be important social comparison- and justice-related reactions. No study to date has tested the overlap or
distinctiveness of these two constructs. At their core, feelings of proper, benign, and malicious envy and relative deprivation are all reactions to perceived disadvantage: when people perceive that they are worse off than others, negative emotions ensue and they attempt to reduce the inequality. For instance, both envy and relative deprivation have been associated with schadenfreude (e.g., Feather, 2015; Smith et al., 1996). Relative deprivation and envy are both associated with outcomes such as poorer health, risk-taking, and deviance (Callan et al., 2008; Callan et al., 2015b; Kim et al., 2013; Mishra & Carleton, 2015; Mishra & Novakowski, 2016). Crucially, societal inequality is also associated with these outcomes (reviewed by Wilkinson & Pickett, 2006, 2007, 2009).

Sensitivity to relative disadvantage reflects the positional bias: the tendency to judge success by making comparisons to others (Hill & Buss, 2006). When trying to maximize one’s relative position, there are two ways to be more “successful”: 1) improve one’s own standing; or 2) degrade the standing of others. People tend to envy others who are better off than themselves, and envious individuals are more likely to pay a cost if the spiteful strategy causes more damage to the envied person (Wobker, 2015). Furthermore, schadenfreude, pleasure at someone else’s failure, is experienced more when the individual suffering a failure is/was envied for being higher in achievement or status (Smith et al., 1996). The positional bias is unexpected given rational choice models of behaviour; specifically, why would someone be so affected by relative disadvantage that they would make more risky decisions, be more spiteful, and experience poorer health? Objectively, the utility of someone’s possessions should be unaffected by what peers possess; enjoyment of a $60,000 car should be unaffected by a neighbor having a
$100,000 car. The functional basis for relative deprivation and envy, and the positional bias more broadly are detailed below.

1.4 Importance of Relative Position

Concerns about relative position are intimately tied to competition, which describes any instance where “one party’s possession or use of a mutually desired resource precludes the other party’s possession or use of the same” (Daly & Wilson, 1988, p. 83). Competition is ubiquitous throughout the animal kingdom. Individuals compete for limited access to sexual partners, resources, territory, and positions of high social standing. Regardless of domain, obtaining desired goods is dependent on the environment (e.g., whether desired goods are scarce or plentiful) and an individual’s ability to acquire resources compared to rivals (Milinski & Parker, 1991). Some have argued that competitive tendencies in humans are due to psychopathology and political structures such as capitalism (e.g., Bhurga, 1993); however, several studies suggest the motivation to outperform others is an evolved psychological design that helps meet goals in competitive environments (reviewed in Hill & Buss, 2006).

A central tenet of evolutionary theory is that present-day behaviours exist because those behaviors historically enhanced, or at least did not hinder, an organism’s ability to survive and/or reproduce (Cosmides & Tooby, 2000). Outcompeting opponents for resources is a critical predictor of fitness in the animal kingdom. Male elephant seals, for example, fight to gain access to harems of females. Successful males become part of the four percent of breeding-age males responsible for 90% of that season’s offspring (Le Boeuf, 1974). As such, successful competitors pass more of their genes onto future generations, meaning that fitness must be considered relative to competitors (Hamilton,
1964). In competitive environments, organisms that fail to notice or counter their own disadvantage (i.e., those that lack a positional bias) should be less likely to have their genes spread across future generations (Garay & Móri, 2011). For example, during times of famine in human society, there is always some quantity of food; however, Sen (1981) argues that those who have the largest relative wealth holdings outcompete others for food. Even in a contemporary society, relative position can be a matter of survival.

The importance of relative position highlights the tension between conflict and cooperation in social species. Helping someone else (e.g., sharing food) can improve the other individual’s chances of producing viable offspring. Since other organisms (apart from identical twins) increase the frequency of competing alleles in the population, helping other people can decrease the relative representation of one’s own genes. However, social behaviour must be considered with its direct and indirect fitness consequences to the actor (Hamilton, 1964). Direct fitness refers to the actor’s immediate gain or loss in reproduction (e.g., reciprocal cooperation). Indirect fitness refers to the reproduction of alleles identical to the actors’, but with these identical alleles being present within individuals other than the actor or the actor’s descendants (e.g., reproductive success of a sibling). The importance of indirect fitness can be best exemplified by altruism, whereby the actor incurs a cost for the benefit of the recipient. Altruistic acts, such as saving another from a physical threat, can reduce the agent’s personal fitness (i.e., number of viable offspring for the agent). However, inclusive fitness theory posits that by selectively targeting altruism towards genetically related individuals (i.e., kin), agents can (in certain environments) propagate shared altruistic genes (Hamilton, 1963). In summary, cooperative behaviours (and indeed any social
action) should be favored when “the sum of its direct and indirect fitness consequences are greater than the mean population fitness” (Krupp, DeBruine, Jones, 2011; reviewed in Lehmann & Keller, 2006). The fitness consequences of social behaviours are thus determined by factors such as resource scarcity, genetic relatedness, mobility of agents, and likelihood of reciprocation. These factors should in turn influence the costs of benefits of competing or cooperating with other individuals.

The implications of inclusive fitness theory must be considered carefully. Although kin members are overall more genetically related than non-kin, relatedness does not ensure cooperative and mutualistic interactions among related individuals. Consider siblings: an agent carries 100% of their own genes, whereas a sibling will carry approximately 50% of the agent’s genes. Although a sibling will generally be more likely to carry the agent’s alleles than the rest of the population, contested resources in shared developmental environments force siblings into conflict (as an agent’s fitness will be most increased if they, instead of their sibling, survive and attain reproductive success). Although sibling presence can aid in food collection and territorial defense in later life stages, contested access to resources necessary for growth and survival can lead to begging behaviours, aggression, and even fratricide across taxa (reviewed in Hudson & Trillmich, 2007).

1.4.1 Relative State Model

The relative state model is the only existing framework of decision-making that incorporates environmental and ability-based factors with relative position (Mishra, Barclay, & Sparks, 2017). The relative state model focuses on risk-taking behaviour; however, the model suggests that both situational and individual-level factors interact to
produce a perception of one’s own relative state, which is the broad assessment of competitive advantage or disadvantage relative to others in the environment.

The relative state model posits that individuals who are disadvantaged will seek to take risks in accordance with risk-sensitivity theory. Specifically, if organisms cannot meet a goal through reliable strategies (a condition of need), they will resort to risky behaviours that are more variable in their outcome (e.g., choosing a 10% chance of $50 over $5 guaranteed). A risk-accepting strategy allows in-need individuals to meet goals that would have been inaccessible otherwise, whether due to environmental or embodied factors. Seeing others better off than one’s self can lead to greater expectations for one’s own possible outcomes (Collins, 1996). Therefore, disadvantaged individuals should engage in greater risk-taking because they have not reached the position of more privileged others.

1.4.2 Proximate Mechanisms Leading from Competitive Disadvantage

The relative state model primarily describes the functional role and antecedents of risk-taking, but also posits that proximate systems (i.e., mechanisms within the individual that generate behaviour) at the hormonal, cognitive, or emotional level must exist to motivate individuals to engage in functional behaviours. Cosmides and Tooby (2000) argue that emotions developed to automatically motivate organisms to resolve recurring adaptive problems. Competitive disadvantage can be categorized as such a challenge. Unfavorable relative states should activate proximate mechanisms that help individuals reduce their perceived disadvantage. Social psychological emotions and hormones should be effective barometers and motivators in response to changes in relative state.
In primates, relative advantage and disadvantage has been linked to behavioural and hormonal changes. Across taxa, most famously baboons, subordinate individuals exhibit substantially higher levels of stress hormones than those that are dominant. However, in unstable hierarchies, dominant individuals experience the greatest amounts of psychological and physiological stress until the social structure is solidified. Hierarchy-driven stress responses are most pronounced when resource access is most highly skewed in favor of dominant individuals (i.e., high environmental inequality; reviewed in Sapolsky, 2005), demonstrating that the psychology of relative state is most pronounced in stratified environments. The generalizability of the primate-stress literature to humans may be limited because an individual’s dominance or subordination is not as important for humans compared to other primates (reviewed in Cheng, Tracy, & Henrich, 2010). However, the literature is suggestive that proximate systems exist across a wide variety of taxa that respond to relative social positioning.

Feelings of relative deprivation and envy, as well as schaudenfreude, likely have developed as psychological systems that detect and respond to competitive disadvantage. From an evolutionary point of view, humans should not have developed visceral reactions to disadvantage to maintain self-esteem. Instead, feelings of envy and personal relative deprivation are part of a functional system to effectively compete for mates, status, and resources (Hill & Buss, 2006). By integrating theories of envy and relative deprivation with evolutionary theory, two key testable hypotheses can be posited: (1) feelings of envy and relative deprivation should be highest when at a relative disadvantage in any domain that is a proxy of biological fitness (e.g., access to desired mates, money); and (2) feelings of envy and relative deprivation should lead individuals
to try to improve their relative state, either by trying to strive upwards or attempting to
damage others. As predicted, feelings of envy and relative deprivation increase in
situations of perceived disadvantage (Callan et al., 2008; Wobker, 2015). Furthermore,
when individuals report feelings of envy and personal relative deprivation, they are more
likely to use higher risk strategies that can improve their personal relative standing, such
as gambling or spiteful behaviours (Callan et al., 2008; Mishra et al., 2015; Wobker,
2015). Overall, feelings of envy and personal relative deprivation motivate individuals to
improve their relative access to proxies of fitness.

**1.5 Sensitivity to Competitive Ability**

The relative state model posits that an individual’s relative state is determined by
both the situation and their own abilities. There has only been limited research examining
whether humans assess their abilities compared to others, and how their relative ability
influences their thoughts, feelings, and behaviours. In contrast, research on animal-
fighting suggests a deeply ingrained sensitivity to relative competitive ability.

There is substantial variability in size, weaponry access, and health within and
between species. Traits that affect fighting ability are broadly referred to as *resource-
holding potential* (Parker, 1974). Fighting for limited resources costs time and risks
injury or death (e.g., Glass & Huntingford, 1988; Kelly & Godin, 2001; Briffa & Elwood,
2004). Due to the immediate and potential costs of fighting, organisms should only fight
when they are likely to have a net benefit from the outcome. In situations where the
opponents are unequal in their fighting ability, weak, unskilled, or ill-equipped opponents
will likely lose the contest. In such a mismatch, a long and intense fight has little value
for the weaker organism.
Relative competitive ability is an important predictor of winning fights, and should influence fighting duration and intensity. Reviewed in Arnott and Elwood (2009), long and intense fighting most often occurs when competitors have similar resource-holding potential. Furthermore, animals fight for a shorter amount of time if they have observed their opponent beforehand. Animals, ranging from mammals to insects, exhibit sophisticated mutual assessment and corresponding behavioural changes. Despite the animal literature indicating widespread sensitivity to inequality in abilities, little research has examined how humans respond to relative competitive ability.

1.5.1 Sensitivity to Embodied Capital in Humans

Evolutionary theorists posit that modern humans behave in ways that helped their ancestors compete for fitness-related resources (Cosmides & Tooby, 2000). Humans who were better able to compete for resources would have enjoyed greater reproductive success over time, therein leading to (a) sensitivity to relative position, and (b) the proliferation of traits that enhance competitive advantage. Consequently, contemporary humans should also be sensitive to their competitive ability. Consistent with the reviewed animal fighting literature, humans (particularly males) are more willing to be physically aggressive when perceiving themselves to have more resource-holding potential (i.e., greater physical size, more allies, a “tougher” reputation) than an opponent (Archer & Benson, 2008).

Human competition does not always involve physical aggression. Attracting sexual partners and accumulating resources can also be determined by factors such as intelligence, attractiveness, and knowledge. The broad suite of intrinsic attributes that allow for successful social competition is known as embodied capital (Bourdieu, 2011;
For the purposes of the current study, embodied capital is a useful term for capturing stable individual differences that individuals leverage to meet goals. However, interpreting embodied capital as a general factor such as the general factor of intelligence may be premature. Social psychological and evolutionary theories have hypothesized a positive relationship between desirable (i.e., fitness-enhancing) traits. Social psychologists posit that attractive individuals are more likely to be given access to opportunities to improve themselves, and evolutionary theorists have argued that more attractive individuals tend to pair with more intelligent mates, resulting in offspring that express both phenotypes (i.e., assortative mating). Despite the theoretical background, empirical investigations have yielded inconsistent support for the hypothesized positive relationship between distinct types of embodied capital (reviewed in Mitchem et al., 2015). In the absence of conclusive evidence concerning the generality of embodied capital, considering each individual form of embodied capital independently is most prudent.

As reviewed above, relative resource-holding potential influences fitness-related outcomes and behaviours. Relative embodied capital should be similarly associated with competitive outcomes, cognitions, and behaviours. Physically attractive individuals are cooperated with more often, have higher social standing with their peers, have more sexual partners, and make more money (Anderson, John, Keltner, & Kring, 2001; Judge, Hurst, & Simon, 2009; Mulford, Orbell, Shatto, & Stockard, 1998; Rhodes, Simmons, & Peters, 2005). Intelligence is associated with income and occupational status, as well as
sexual desirability (Buss, 1989; Ceci & Williams, 1997; Hauser & Huang, 1997; Sherkat, 2010). In a Malaysian sample, office workers were physically stronger than manual laborers and unemployed individuals (Hossain, Zyroul, Pereira, & Kamarul, 2012). Stronger males have more sexual partners and earlier first sexual encounters (Gallup, White, & Gallup, 2007). Taller individuals have greater incomes and occupational status (Judge & Cable, 2004), and taller males are perceived as more attractive (Lerner & Moore, 1974). Together, these results suggest that embodied capital is essential for successful interpersonal competition. Moreover, individuals appear to exhibit a greater positional bias when considering relative embodied capital compared to relative wealth. Although wealth and other outcomes (such as access to desirable romantic partners) can be transient, embodied capital is present within an individual across multiple domains and instances of competition.

Having low embodied capital puts individuals at a competitive disadvantage. Those who do not possess high levels of intelligence, for example, are less likely to find themselves in high paying jobs given that such jobs are typically cognitively complex (Ceci & Williams, 1997). Disadvantage in resource access (via high salaries and occupational prestige/status) manifests because of a relatively stable embodied trait (low intelligence).

There is evidence that people are sensitive to how their embodied capital compares with others. Solnick and Henenway (1998) found that 68-80% of individuals would sacrifice their absolute attractiveness and intelligence to be more attractive and intelligent relative to others. The preference for relative embodied capital is greater than the 38-56% of individuals who reported preferring greater relative income. Mishra,
Barclay, and Lalumière (2014) manipulated feedback on an intelligence test and found evidence that people took more in-lab risks when they received an evaluation denoting below-average intelligence. The result is consistent with risk-sensitivity theory (Mishra, 2014), which predicts that low embodied capital (and thus competitive disadvantage) would lead to greater risk-taking. Humans seem to have, at minimum, an implicit understanding that relative embodied capital influences their access to desired outcomes.

Past studies describe how objective indices of embodied capital are associated with proxies of fitness. However, the existing research does not capture how perceptions of embodied capital uniquely affect individuals’ perceived competitive ability. Social comparisons are based primarily upon perceptions of oneself and others, rather than objective reality. Among a variety of other perceptual biases, individuals tend to overestimate their embodied capital (i.e., the self-enhancement bias or above average effect, e.g., Nestor, Stillman, & Frisina, 2010). The systematic inaccuracy in self-assessments highlights that individuals’ self-perceptions are informed by factors beyond objective reality. Thus, subjective ratings of embodied capital will likely uniquely predict individuals’ experiences of envy and relative deprivation, even after controlling for objective measures of embodied capital.

Self-efficacy, described as “beliefs in one’s capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands” (Wood & Bandura, 1989, p. 408), could be considered (at least in part) analogous to perceived embodied capital; one’s capacity to meet situational demands should be determined at least in part by ability. While self-efficacy also captures individuals’ confidence in their ability to effectively wield their embodied capital, self-
efficacy should be informed by the belief that one has sufficient embodied capital to wield for the task. In support of the role of embodied capital in self-efficacy, general mental ability and experience are both positively associated with higher work-related performance and task-specific self-efficacy (reviewed in Judge, Jackson, Shaw, Scott, & Rich, 2007). In sum, self-efficacy should indicate an individual’s confidence in their ability to carry out fitness- and competition-related tasks.

Embodied capital and self-efficacy may have a unique relationship with benign envy. Perceived control has been argued to be a defining component of benign envy; when recalling instances of benign envy, individuals tend to report having greater control over their situation than those recalling instances of malicious envy (van de Ven et al., 2009). One would expect that possessing sufficient embodied capital would lead an individual to believe that they are able to “meet situational demands” (Wood & Bandura, 1989, p. 408). Rather than fostering malicious intent towards their comparator, an internal locus of control would increase an individual’s motivation to strive upwards in a disadvantaged situation, and thus be positively associated with benign envy.

1.6 Hypotheses

Taken together, extant empirical and theoretical work suggests individuals experience feelings of envy and relative deprivation when perceiving victimization by inequality. Inequality can manifest in two forms: 1) environmental inequality, defined as skewed distribution of resources and outcomes; and 2) individual differences in embodied capital. Humans feel envy and relative deprivation when they have less resources, status, or reproductive success. Feelings of relative deprivation and envy should also manifest when humans lack the ability to compete for these proxies of fitness
(i.e., a competitive disadvantage). The proposed study will test two main hypotheses: (1) self-perceived and objective measures of embodied capital will be negatively correlated with measures of relative deprivation and envy, and (2) self-perceptions of embodied capital will account for unique variance in measures of personal relative deprivation and envy above and beyond objective measures.

The current study will test several specific predictions. All measured forms of embodied capital (i.e., hand grip strength, verbal intelligence, performance on the Peg Task, small difference between hands on the Peg Task, low body fat, high muscle composition) will be negatively correlated with scores on the Personal Relative Deprivation Scale, the Dispositional Envy Scale, the Domain-Specific Envy Scale, and the malicious envy component of the Benign and Malicious Envy Scale. Embodied capital will be positively correlated with the benign envy component of the Benign and Malicious Envy Scale. The competence component of the domain-specific envy scale will be correlated with measures of intelligence (i.e., performance on the verbal ability test, intelligence items in the self-attributes scale, the self-reported embodied capital scale). Objective measures of embodied capital are important to reduce the impact of response biases (reviewed in Hoorens, 1993); however, self-perceptions of embodied capital may be unique predictors of feelings of envy and personal relative deprivation. Self-perceived embodied capital, as measured by the Self-Attributes Questionnaire and the Self-Report Embodied Capital Scale, will account for statistically significant variance in self-reported feelings of envy and personal relative deprivation (i.e., Personal Relative Deprivation Scale, Dispositional Envy Scale, Benign and Malicious Envy Scale, Domain-Specific Envy Scale) above and beyond objective measures of embodied capital (i.e.,
height, muscle mass %, body fat %, hand grip strength, peg task completion time, handedness in the peg task, verbal ability score).

Self-efficacy should be positively correlated with indices of objective and perceived embodied capital. Moreover, general physical, and social self-efficacy will be negatively correlated with relative deprivation, envy proper, and malicious envy, but positively associated with benign envy. These relationships should remain statistically significant even after controlling for all other measurements of embodied capital.

2.0 Methods

Undergraduate participants, $n = 198$ (59 males, $M_{\text{age}} = 22.04, SD = 4.38$), were recruited from participant pools in the Department of Psychology and the Faculty of Business Administration at the University of Regina. The procedure was conducted at an on-site laboratory and was conducted by one of four researchers. Participants were compensated with course credit.

2.1 Measures

2.1.1 Demographic Measures

Participants completed the following demographic questions: age, sex, relationship status, number of children, number and type of siblings, employment status, mental illnesses, household income, personal income, employment status, and whether they had been arrested, charged, convicted, and/or incarcerated due to a criminal offence.

2.1.2 Personal Relative Deprivation.

Feelings of relative deprivation were measured using the *Personal Relative Deprivation Scale – Revised* (PRDS-R; Callan, Shead, & Olson, 2011). The PRDS-R is a 5-item measure of the degree to which people feel subjectively deprived relative to others.
(e.g., “I feel resentful when I see how prosperous other people seem to be”). Items are rated on a scale from 1 (strongly disagree) to 7 (strongly agree). The PRDS-R has had acceptable internal consistency, $\alpha = 0.86$ (e.g., Callan et al., 2011), and has been associated with poorer physical and mental health (Callan et al., 2015b; Mishra & Carleton, 2015), and higher levels of risk-related personality, attitudes, and behavior (Mishra & Novakowski, 2016). Research into envy and relative deprivation is rapidly growing, with several emerging measurements. Accordingly, participants responded to multiple measures of envy.

2.1.3 Dispositional Envy Scale.

The Dispositional Envy Scale (Smith, Parrott, Diener, Hoyle, & Kim, 1999) is the most established measure of envy proper to date. Participant’s chronic feelings of envy proper (e.g., “Feelings of envy constantly torment me”) are assessed with eight items, each rated from 1 (strongly disagree) to 5 (strongly agree). The measure has good internal consistency (as posited by Streiner, 2003), $\alpha = 0.83$-$0.86$, and two-week test-retest reliability, $r = 0.80$, and has been associated with lower self-esteem, more depressive symptoms, higher neuroticism, lower happiness, and lower life satisfaction (Smith et al., 1999).

2.1.4 Domain-Specific Envy Scale

The Domain-Specific Envy Scale (Rentzsch & Gross, 2015) is a 15-item measure that assesses envious reactions in three distinct domains; specifically, attraction (e.g., “It bothers me when others can have every romantic partner that they want”), competence (e.g., “It is hard to bear when other people are more intelligent than I am”), and wealth (e.g., “It bothers me when others own things that I cannot have”). Items are rated from 1
(not at all) to 7 (very much). The internal consistencies, $\alpha_{\text{Total}} = 0.91-0.93$, $\alpha_{\text{Attraction}} = 0.80-0.90$, $\alpha_{\text{Competence}} = 0.84-0.89$, $\alpha_{\text{Wealth}} = 0.84-0.88$, and three-month test-retest reliabilities, $r_{\text{Total}} = 0.77$, $r_{\text{Attraction}} = 0.78$, $r_{\text{Competence}} = 0.72$, $r_{\text{Wealth}} = 0.73$, of the total scale and subscales range from good to excellent.

### 2.1.5 Benign and Malicious Envy Scale

The Benign and Malicious Envy Scale (Lange & Crusius, 2015) is a 10-item measure assessing typical dispositional responses to perceived disadvantage. Benign envy motivates individuals to reach the envied person’s position (e.g., “Envying others motivates me to accomplish my goals”) and malicious envy reflects the desire to bring the envied person down to the envier’s position (e.g., “I feel ill will toward people I envy”). The benign and malicious envy factors are each five items and have high internal consistency, $\alpha = 0.79-0.85$ and 0.83-0.90, respectively. Benign envy is associated with greater hope for success, whereas malicious envy is associated with more fear of failure (Lange & Crusius, 2015).

### 2.1.6 Objective Measures of Embodied Capital

Embodied capital was assessed by measuring hand grip strength, manual dexterity, severity of hand preference, verbal intelligence, and body fat percentage. Handgrip strength was assessed using a Jamal Hydraulic Hand Dynamometer according to the standardized procedure detailed by Roberts et al. (2011). Handgrip strength has been associated with reproductive success in an ancestral population (Atkinson, et al., 2012), more sexual partners in males (Gallup et al., 2007), and slower cognitive decline (Alfaro-Acha, et al., 2006).
Symmetrical faces are considered more attractive than less symmetrical ones (Perrett et al., 1999; Rhodes et al., 2005). As such, participants’ pictures were taken under standardized distance and lighting conditions. However, facial symmetry is an imperfect correlate of facial attractiveness, and has been characterized as a weak signal in a “sea of noise” (e.g., Hume & Montgomerie, 2001). The conceptual limitations of facial symmetry, combined with a high frequency of non-planar orientation photographs, led to the exclusion of facial symmetry from the current analyses. However, 146 participants consented to having their pictures distributed to third parties to be rated on attractiveness. Although the collection and analysis of third-party ratings of facial photographs were not conducted for the current study, photographs will eventually be independently rated for attractiveness using a sample outside of Regina.

Manual dexterity and severity of handedness were measured using the Peg Task (Mathiowetz, Weber, Kashman, & Volland, 1985). Participants were instructed to move 10 wooden pegs into holes as fast as they can, with trials alternating between their right and left hands. Research indicates that severities in handedness are indicators of developmental instability. Extreme handedness associated with minor physical anomalies, such as widely spaced eyes and low ears. Severity of handedness is also associated with fluctuating asymmetries such as foot, ear, elbow, and knee breadth. Extreme handedness is also associated with schizophrenia and low birth weight. Minor physical anomalies and fluctuating asymmetries are both considered classic markers of developmental instability (reviewed in Yeo & Gangestad, 1994).

The Peg Test has most frequently been used with individuals suffering motor impairments and has adequate test-retest reliability, $r_s = 0.43$ to 0.69 (Mathiowetz et al.,
Participants had their performance time measured across eight trials (four for the left hand, four for the right). Severity of handedness was assessed by subtracting the average performance time for the dominant hand from the average time for the non-dominant hand. In eight cases, the subtracting procedure yielded negative values, signaling that participants’ reported dominant hand was actually slower than their reported non-dominant hand. Indices of handedness which yielded negative signs were reversed to reflect functional asymmetry, despite participants’ self-reported handedness.

Individuals had their height measured. Height has been associated with income, controlling for age, sex, and weight (Judge & Cable, 2004), and taller men are judged as more attractive (Lerner & Moore, 1974; Shepperd & Strathman, 1989). Individuals also had their body fat percentage and muscle percentage measured using impedance analysis with an Ozeri Touch Digital Bath Scale. An Omron HBF-306CAN Fat Loss Monitor was also used to calculate body fat percentage from the upper body. Body Mass Index has been negatively correlated with perceived bodily attractiveness in men (Hönkopp, Rudolph, Beier, Liebert, & Müller, 2007), and lean body mass is positively correlated with infant birth weight in low socioeconomic status east Indian mothers (Kulkarni, Shatrugna, Balakrishna, 2006). The current study also collected participants’ Body Mass Index; however, Body Mass Index is calculated using only height and weight, thereby ignoring participants’ body composition (e.g., a short individual with a very high lean body mass would have a high Body Mass Index, as would a short person with high body fat). As such, indices of body fat and muscle percentage were used, as they are more accurate indicators of embodied capital.
Verbal intelligence was assessed using the verbal ability subscale of the General Social Survey (Smith, Hout, & Marsden, 2012). The verbal ability task uses ten word-equivalence items (e.g., “select the most similar word to the term *beast*: disruption, landscape, *animal*, lumber, police”) and has been associated with several measures of general intelligence, as well as occupational status and earnings (Hauser & Huang, 1997; Sherkat, 2010).

### 2.1.7 Subjective Embodied Capital

Perceived embodied capital, as opposed to objective embodied capital, may account for unique variance above and beyond objective measures. The *Self-Attributes Questionnaire* (Pelham & Swann, 1989) and the *Self-Report Embodied Capital Scale* (Novakowski & Mishra, 2015b) were used to assess individual self-perceptions of traits such as physical strength, physical attractiveness, and intelligence. The *Self-Attributes Questionnaire* is a 10-item measurement that asks participants to rank themselves on a 10-point percentile scale on their traits and abilities. The *Self-Attributes Questionnaire* has acceptable 4-month test-retest reliability, $r = 0.77$, and internal consistency, $\alpha = 0.76$ and is associated with self-esteem and self-reported social inclusion (Pelham & Swann, 1989). The *Self-Report Embodied Capital Scale* is a 10-item scale that asks participants to rank themselves out of 10 hypothetical individuals who were of similar age and sex (one being the individual lowest in a trait, 10 being the highest). The *Self-Report Embodied Capital Scale* is associated with more prosocial and non-antisocial risk-taking, greater general self-efficacy, as well as greater self-esteem (Novakowski & Mishra, 2015a; 2015b).
2.1.8 Self-Efficacy

Participants also completed multiple measures of self-efficacy. Self-efficacy was measured using the New General Self-Efficacy Scale (Chen, Gully, & Eden, 2001), the Scale of Perceived Social Self-Efficacy (Smith & Betz, 2000), and the Physical Self-Efficacy Scale (Ryckman, Robbins, Thornton, & Cantrell, 1982). The Self-Attributes Questionnaire and the Self-Report Embodied Capital scales should provide an index of perceived quality and ability; however, the scales measure very discrete forms of embodied capital, such as strength, musical skills, and verbal intelligence. Self-efficacy is grounded in diverse behaviours, rather than the ranking of discrete traits. As such, measures of self-efficacy may provide a more comprehensive assessment of perceived embodied capital not captured by other measures, and thus uniquely predict feelings of envy and relative deprivation.

The New General Self-Efficacy Scale was developed to replace the General Self-Efficacy Scale developed by Sherer et al. (1982). The New General Self-Efficacy Scale has good internal consistency, (α = 0.86 to 0.90; Chen et al., 2001). The new scale is one-dimensional, whereas the General Self-Efficacy Scale has yielded three dimensions. The New General Self-Efficacy Scale is highly related to, but still distinct from, self-esteem (Chen et al., 2001). The New General Self-Efficacy Scale is associated with task-specific self-efficacy in domains such as exam-writing, music, persuasion, and literature, and was associated with actual performance on a mid-semester exam (Chen et al., 2001).

Self-efficacy in social scenarios was measured using the Scale of Perceived Social Self-Efficacy (Smith & Betz, 2000). Participants were asked about their confidence to engage in a variety of social behaviours (e.g., “Start a conversation with someone you
don’t know very well”) Three-week test-retest reliability was $r = 0.82$ and internal consistency was $\alpha = 0.94$. Scores on the Scale of Perceived Social Self-are is associated with the social self-efficacy subscale of Sherer et al.’s (1982) General Self-Efficacy Scale and the social skills subscale of the Skills Confidence Inventory (Betz, Borgen, & Harmon, 1996). Social self-efficacy is also associated with less shyness, less social anxiety, and higher self-esteem (Smith & Betz, 2000).

Physical self-efficacy was measured using the 22-item Physical Self-Efficacy Scale (Ryckman et al., 1982). The scale contains two factors: perceived physical ability (“I can’t run fast”), and physical self-presentation confidence (“I am rarely embarrassed by my voice”). Items are rated from strongly disagree (1) to strongly agree (6). The internal consistencies $\alpha_{\text{Total}} = 0.85$, $\alpha_{\text{Perceived physical ability}} = 0.75$, $\alpha_{\text{Physical self-presentation confidence}} = 0.82$ and six-week test-retest reliabilities of $r_{\text{Total}} = 0.80$, $r_{\text{Perceived physical ability}} = 0.69$, $r_{\text{Physical self-presentation confidence}} = 0.80$ range from good to excellent. Scores on the Physical Self-Efficacy Scale are associated with higher self-esteem, less self-consciousness, lower anxiety, greater sports involvement, better performance on a dart-throwing task, better reaction times, and more athletic body types (as assessed by third party observers).

2.2 Procedure

Sessions occurred in two consecutive phases: 1) a self-report phase and 2) a physical measurement phase. Participants were asked to provide informed consent prior to starting the self-report phase. The self-report phase included all self-report measures. Participants also completed additional inventories to address separate questions regarding risk-taking behaviour, mindfulness, and psychopathology. All questionnaire items were randomized to prevent order and fatigue effects. Participants informed the researcher
when they finished the self-report items and then the researcher conducted the physical measurement phase. Physical measurements were presented in a consistent order for convenience purposes (i.e., shoes need to be taken off for measurements of height, weight, body fat percentage, and muscle percentage): hand grip strength, height, the Ozeri Touch Digital Bath Scale, the Omron HBF-306CAN Fat Loss Monitor, then the peg task. Participants were then debriefed and thanked for their time.

2.3 Variable construction

Given the considerable number of variables in the current study, an exploratory factor analysis using principal axis factoring (direct oblimin rotation) was conducted to determine whether items from the Self-Perceived Embodied Capital Scale and the Self Attributes Questionnaire could be reduced to a more manageable response set (correlation matrices reported in Tables 1, 2, and 3), $KMO = 0.81$, Bartlett’s test of sphericity, $p < .001$. The first analysis retained five factors (accounting for 64.85% of the observed variance). Sense of humor and artistic/musical ability failed to load on any factor ($< 0.30$), while leadership and intellectual ability crossloaded across two factors. Perceived sense of humor, as well as artistic/musical, leadership, and intellectual ability were removed from the subsequent factor analyses. A second factor analysis retained four factors (accounting for 66.21% of the observed variance). Perceived athletic ability crossloaded across factors one and two, so was removed from subsequent analyses. Perceived general intelligence failed to load on any factor ($< 0.30$), but was retained, as self-reports of intelligence tended to load on the fifth factor in the first factor analysis. In the third factor analysis (four factors accounting for 66.82% of the variance), perceived general and verbal intelligence failed to load on any of the four factors ($< 0.30$).
However, self-perceptions of intelligence loaded on the fifth factor in the first analysis. As such, a fourth factor analysis was conducted, with the extraction criterion retaining five factors. The fourth and final model accounted for 73.52% of the observed variance. Although the fifth factor had an eigenvalue of 0.94 (below the commonly used threshold of eigenvalue > 1), this final factor was retained because the inclusion of a fifth factor uniquely accommodated items regarding perceived intelligence. In summary, the final model yielded five distinct factors that were interpreted as the following: (1) perceived attractiveness, (2) perceived social skills, (3) perceived athletic ability, (4) perceived emotional skills, (5) perceived intelligence. Importantly, the items concerning intelligence (e.g., “If you were one of 10 people to have your general intelligence evaluated, which one would you most likely be?”) loaded negatively on the factor of perceived intelligence. As such, a higher score on the factor of perceived intelligence is suggestive of lower perceived embodied capital. For ease of comprehension, scores on perceived intelligence will be reverse-scored in the upcoming correlation and regression tables, so that a higher score on perceived intelligence reflects higher embodied capital.

Body fat percentage was highly correlated across both upper (normal and athlete mode) and lower body measurements $r_s = 0.83$ and 0.81, respectively. As such, body fat percentage was calculated by averaging all of participants’ body fat measures (lower body, upper body “normal” mode, upper body “athlete” mode, maximum of 8 measurements). Muscle percentage was highly correlated across two repeated measurements, $r = 0.91$. As such, muscle percentage was calculated by averaging both of participants’ readings on the Ozeri Touch Digital Bath Scale. Hand grip strength was highly correlated across all six measurements, $r_s = 0.9$ to 0.96. For analyses, hand grip
strength was calculated by averaging participants’ dominant and nondominant hand grip strength into a single index of overall grip strength. Completion time of the peg task was highly correlated across all trials, $r_s = 0.66$ to 0.88. Peg task completion time was calculated by averaging individual performance across all trials.

3.0 Results

Descriptive statistics and reliability estimates for all measures are provided in Table 6. Reliability analyses using Cronbach’s alpha indicated that the internal consistency of the measures ranged from near-acceptable to excellent (Streiner, 2003). Examination of Skewness and kurtosis statistics, Q-Q plots, histograms, and Shapiro-Wilk tests suggested that several of the measures used in the current study had unacceptably non-normal distributions. As such, all correlation and regression analyses were conducted using bootstrapping analyses with 2000 resamples (Efron & Tibshirani, 1993) and 95% confidence intervals being calculated using the bias-corrected accelerated option in IBM SPSS Statistics 22.

3.1 Partial correlations

All correlations were bootstrapped and controlled for age and reported gender. There was a moderate amount of interrelatedness between objective measures of embodied capital. Higher body fat percentage was associated lower muscle percentage and severities in handedness on the peg task. Taller individuals tended to have a stronger grip strength, as did participants with a higher score on the verbal intelligence test. However, taller individuals also tended to have lower muscle percentage. Participants with a stronger grip were faster when completing the Peg Task. Participants with a faster
performance time on the peg task also tended to have less disparity between their left and right hands (Table 7).

All measurements of self-efficacy were significantly intercorrelated with each other (Table 8). All five factors of perceived embodied capital (attractiveness, social skills, athletic ability, emotional skills, intelligence) were significantly intercorrelated with each other. Perceived athletic ability was not associated with physical self-presentation confidence nor general self-efficacy. Neither perceived emotional skill nor perceived intelligence were associated with the perceived physical ability factor of the physical self-efficacy scale. Additionally, perceived intelligence was not associated with physical self-presentation confidence. All other factors of perceived embodied capital were significantly correlated with measures of self-efficacy.

Perceived attractiveness and the perceived physical ability subscale of the physical self-efficacy scale were negatively associated with body fat percentage and positively associated with muscle percentage (Table 9). Neither handedness on the peg task nor height had any relationship with any form of perceived embodied capital. Performance on the verbal intelligence task was positively correlated with perceived intelligence, as well as perceived emotional ability, attractiveness, and reported general self-efficacy. Grip strength was positively associated with the perceived physical ability subscale of the physical self-efficacy scale and perceived athletic ability. Completion time on the peg task was negatively associated with the perceived physical ability subfactor of the physical self-efficacy scale and general self-efficacy (Table 9).

In summary, objective indices of embodied capital were associated with relevant self-reports of embodied capital and self-efficacy. Physical traits (i.e., muscle and fat
composition, grip strength, peg task performance) tended to correlate with beliefs concerning attractiveness and physical ability. There was some evidence that some forms of embodied capital can influence multiple domains of self-evaluation. Although performance on the verbal intelligence task was indeed positively correlated with perceived intelligence, verbal intelligence was also associated with perceived attractiveness, emotional ability, and general self-efficacy. These results suggest that beliefs regarding one’s embodied capital and self-efficacy may be informed by actual embodied capital. Moreover, it appears that intelligence can influence both specific and general self-evaluations.

All measures of envy were significantly intercorrelated, $r_s = 0.26$ to 0.64 (Table 10). Personal relative deprivation was associated with envy proper, as well as attraction-based, wealth-based, and malicious envy. However, personal relative deprivation was not significantly associated with benign nor competence-based envy. Objective indices of embodied capital were inconsistently associated with feelings of envy and personal relative deprivation, but those relationships that were significant were in the predicted direction. Body fat percentage and handedness on the peg task were positively correlated with solely envy proper. Performance on the verbal intelligence task was negatively correlated with only reported personal relative deprivation. Neither grip strength, peg task performance time, height, nor muscle percentage were significantly associated with any measures of envy or personal relative deprivation (Table 11). These results are suggestive of limited relationships between objective embodied capital and feelings of disadvantage; objective embodied capital (i.e., body fat, verbal intelligence, extreme handedness) was only associated with general measures of envy and personal relative deprivation.
There was some evidence for an effect of objective embodied capital on feelings of envy and personal relative deprivation. However, one of the hypotheses for the current study was that perceptions of embodied capital would account for unique variance in feelings of disadvantage above and beyond objective indices of embodied capital. Before examining the effects of perceived embodied capital in the upcoming multiple regressions, partial correlations between perceived embodied and the criterion variables may serve as a preliminary test of the hypotheses. Perceived attractiveness was negatively associated with only envy proper. Perceived social skills were negatively associated with envy proper, personal relative deprivation, and wealth-based envy. Perceived athletic ability was not significantly associated with any measure of envy nor personal relative deprivation. Perceived intelligence was negatively correlated with feelings of personal relative deprivation. Perceived emotional skills were associated with less envy proper, personal relative deprivation, as well as less attraction-based and malicious envy.

General self-efficacy was negatively correlated with malicious, attraction- and wealth-based envy, as well as envy proper and personal relative deprivation, but was not significantly associated with competence-based nor benign envy. Social self-efficacy was negatively correlated with envy proper, malicious, attraction-, and wealth-based envy, as well as personal relative deprivation, but was not associated with competence-based nor benign envy. Perceived physical ability was not significantly correlated with any measure of envy nor relative deprivation. Physical self-presentation confidence was negatively correlated with all measures of envy and personal relative deprivation (Table 11). The results indicate that perceptions of embodied capital and self-efficacy have a farther-
reaching relationship with feelings of disadvantage than solely objective indices of embodied capital. While indices of perceived physical ability and intelligence were null correlates of feelings of disadvantage, items concerning perceived emotional skills and self-efficacy had fairly consistent associations with feelings of envy and personal relative deprivation.

3.2 Hierarchical Regression Analyses

Bootstrapped hierarchical multiple regressions were conducted to determine whether embodied capital is associated with the various measures of envy and relative deprivation. The hierarchical regression models were conducted in four steps: (1) age and sex; (2) objective forms of embodied capital (i.e., height, muscle %, body fat %, hand grip strength, peg task completion time, peg task handedness, and verbal ability score); (3) perceived embodied capital (i.e., attractiveness, social skills, athletic ability, emotional skills, intelligence); and (4) general and social self-efficacy and the two subfactors of physical self-efficacy. The analysis plan was devised to: (1) control for basic demographic characteristics, (2) assess the effect of objective embodied capital beyond age and gender, (3) determine whether self-perceptions of embodied capital were unique determinants of envy and personal relative deprivation above and beyond objective measures, and (4) assess whether measures of self-efficacy could account for variance these feelings of disadvantage after controlling for both objective and subjective indices of embodied capital. The use of 18 predictor variables across seven regressions increases the likelihood of Type I Error. However, due to the directional hypotheses and controlled analyses, the hierarchical regressions were not adjusted for multiple
comparisons. The reported $p$-values and 95% confidence intervals should thus be considered with greater scrutiny.

It should be noted that the regressions conducted are slightly overparameterized for the current study’s sample size. Tabachnik and Fidell (2007) recommend that a regression model with $m$ predictors requires a sample size greater than $50 + 8m$ for tests of the overall model and a sample size greater than $104 + m$ for testing whether a specific predictor has an influence. Thus, for the regressions conducted, $n=194$ cases are recommended to test the overall model, and $n=122$ to test individual predictors. However, due to missing data, the regressions conducted had sample sizes of $n=109$ to 110 with pairwise exclusions. The combination of many predictor variables and relatively low sample size can be seen to affect variance accounted for in the models, as seen in negative $R^2$ adjusted values in the models analyzing attraction- and competence-based envy (Tables 14 and 15), and $\Delta R^2$ values coupled with negligible increases in $R^2$ adjusted values across regressions (e.g., Table 14).

Summaries of hierarchical regressions are available in Tables 12 to 18. When explaining envy proper (Table 12), the steps introducing self-perceived embodied capital (Step 3) and self-efficacy (Step 4) accounted for significant portions of variance ($\Delta R^2$s = 0.17, 0.23 respectively). However, the step introducing objective measures of embodied capital (Step 2) did not significantly improve the model fit. In the final model ($R^2_{adj}$ =0.47), social self-efficacy and physical self-presentation confidence were the only variables to account for unique variance in envy proper, being negatively correlated with scores on the Dispositional Envy Scale, as hypothesized.
When explaining scores on the Personal Relative Deprivation Scale-Revised, steps introducing objective indices of embodied capital, as well as self-efficacy, significantly improved the model fit ($\Delta R^2$s = 0.18, 0.08, respectively; Table 13). In the final model ($R^2_{adj} = 0.24$), verbal intelligence, perceived attractiveness, and physical self-presentation confidence uniquely contributed to the model fit. Verbal intelligence and physical self-presentation confidence were negatively correlated with personal relative deprivation, as predicted, whereas perceived attractiveness was positively associated with the criterion, the opposite direction as predicted.

When explaining scores on the attraction subscale of the Domain-Specific Envy Scale, only the final step introducing self-efficacy significantly improved the model fit ($\Delta R^2 = 0.19$). In the final model ($R^2_{adj} = 0.17$), physical self-presentation confidence was the only variable to contribute significant variance to attraction-based envy, being negatively correlated with scores on the attraction subscale of the Domain-Specific Envy Scale (Table 14). When explaining scores on the competence subscale of the Domain-Specific Envy Scale, the step introducing self-efficacy was the only one to significantly improve the model fit ($\Delta R^2 = 0.16$, $R^2_{adj} = 0.09$), with physical self-presentation confidence solely improving the model fit (Table 15). When explaining scores on the wealth subscale of the Domain-Specific Envy Scale, the step introducing self-efficacy was the only one to significantly improve the model fit ($\Delta R^2 = 0.13$). In the final model ($R^2_{adj} = 0.14$), physical self-presentation confidence was the only significant individual predictor (Table 16).

When explaining scores on the benign envy subscale of the Benign and Malicious Envy Scale, introducing measures of self-efficacy was the only step to significantly
improve the model fit ($\Delta R^2 = 0.17$). In the final model ($R^2_{\text{adj}} = 0.13$), physical self-presentation confidence was negatively correlated with experiences of benign envy (again, with the single largest effect). General self-efficacy was a marginal nonsignificant correlate of benign envy, $p = .06$ (Table 15).

When explaining scores on the malicious subscale of the Benign and Malicious Envy Scale, only the step self-efficacy significantly improved the model fit ($\Delta R^2 = 0.21$). In the final model ($R^2_{\text{adj}} = 0.30$), body fat percentage, muscle percentage, perceived attractiveness, general self-efficacy, and physical self-presentation confidence accounted for unique variance in malicious envy. Muscle and fat percentage, as well as overall perceived attractiveness were positively associated with malicious envy, whereas general self-efficacy and physical self-presentation confidence were negatively correlated with malicious envy (Table 16).

4.0 Discussion

Feelings of envy and personal relative deprivation often have a corrosive effect on psychological, social, and even physiological functioning. The relative state model (Mishra et al., 2017) posits that the possession of low relative embodied capital is an antecedent of feelings of disadvantage. The current study sought to test whether indices of objective and perceived embodied capital are associated with experiences of envy and relative deprivation, and whether perceptions of embodied capital would account for variance in these social comparison reactions above and beyond objective measures.

In summary, the current study found that objective indices of embodied capital were weakly negatively correlated with certain measures of envy (the only emerging effects being envy proper’s positive correlations with body fat and extreme handedness, and
a negative correlation between personal relative deprivation and verbal intelligence). When examined in the final models of the regression analyses, verbal intelligence accounted for unique variance in feelings of personal relative deprivation, but body fat failed to uniquely explain envy proper. Interestingly, despite body fat and muscle percentage not significantly correlating with malicious envy, both body fat and muscle percentage accounted for unique variance in the final regression model explaining malicious envy. Although muscle percentage was a null correlate of malicious envy, \( r = -0.13, p = 0.19 \) (Table 11), the final model explaining malicious envy saw muscle percentage become a significant positive correlate of the criterion. Only some forms of objective embodied capital have a small link to feelings of disadvantage. Moreover, most do not add unique variance after controlling for subjective indices of embodied capital and self-efficacy. These results only provide partial support for the hypothesis that objective embodied capital would explain variance in feelings of disadvantage. However, the role of muscle percentage in malicious envy must be examined further.

Self-efficacy accounted for most of the variance in all seven of the regression analyses. The widespread utility of self-efficacy supported the hypothesis. Most notably, self-efficacy accounted for variance in the criterion variables even after controlling for objective and subjective indices of embodied capital. Physical self-presentation confidence (and general self-efficacy, to a lesser extent) accounted for the explanatory power of the regression steps introducing self-efficacy, being negatively correlated with all measures of envy and personal relative deprivation, and accounting for unique variance in all final regression models. The analyses revealed that individuals’ tendencies to feel envious or relatively deprived can be most consistently explained by individuals’
reported confidence when encountering consequential social evaluations (physical self-presentation confidence). Although there is some evidence that objective indices of embodied capital can explain feelings of personal relative deprivation independent of perceived embodied capital and self-efficacy, most of the effects of embodied capital appear to be subsumed under the effects of general self-efficacy and physical self-presentation confidence.

4.1 Correlations Across Objective Measures of Embodied Capital

Grip strength was most broadly associated with other objective forms of embodied capital, being associated with height, verbal intelligence, and coordination/dexterity. Although grip strength was associated with height, grip strength was not associated with body fat nor muscle percentage (Table 7). Muscle mass, rather than muscle percentage, may influence grip strength; if a 100-pound and 200-pound individual were to have identical muscle percentages, the 200-pound individual would inarguably have more muscle mass. Alternatively, grip strength may be principally influenced by efficient recruitment of existing muscle fibers. Grip strength was also associated with faster performance on the peg task, suggesting that there may be an underlying component of physical embodied capital increasing manual strength and dexterity. Like all forms of embodied capital, manual competence is likely caused by interactions between gene expression and environmental factors (such as athletic training).

Interestingly, grip strength was also associated with performance on the verbal intelligence task (Table 7), a finding that is less intuitive than the relationship between strength and dexterity; verbal intelligence and the ability to squeeze do not have much
conceptual overlap. The relationship between grip strength and performance on the verbal intelligence task could be considered as evidence for “general embodied capital” within individuals; if smarter, stronger individuals selectively chose (and still choose) mating partners who were similarly high in embodied capital, such traits should be overrepresented, and positively correlated, within their offspring (i.e., assortative mating, Buss, 1985). However, the assortative mating hypothesis must still account for the null association between verbal intelligence and performance on the Peg Task; if some common factors of ability are driving the relationships between manual strength and dexterity, as well as strength and intelligence, why do we not observe a similar relationship between dexterity and verbal intelligence?

It may be the case that strong individuals are more likely to self-select into physically demanding tasks that allow for the practice of manual dexterity. For instance, someone high in physical strength and stamina could enter a sport that requires substantial practice of fine motor skills (e.g., stick handling in hockey), and thus develop generalizable fine motor skills. Such specialization decisions could conceivably be made independent of one’s intelligence.

Beyond grip strength, body fat percentage was associated with extreme handedness, which was in turn associated slower performance on the peg task (Table 7). If severities in handedness are indeed an indicator of developmental instability, these results provide some evidence that developmental instability (and individuals’ abilities to cope with such fluctuations) are associated with individual differences in body composition and manual dexterity. Alternatively, the relationship between body fat percentage and extreme handedness might be better accounted for by individuals’
physical activity; those who exercise tend to have lower body fat percentage (Ballor & Keesey, 1991), and may develop greater general coordination and dexterity, as well as help reduce discrepancies in handedness. Future studies should test the predictive ability of developmental instability versus exercise levels in accounting for individual differences in handedness, dexterity, and body fat percentage.

4.2 Correlations Between Subjective Embodied Capital and Self-Efficacy

The broad intercorrelations between self-perceived embodied capital and self-efficacy (Table 8) are suggestive of a common factor underlying participants’ perceptions of being capable individuals possessing many desirable traits. The factor underlying self-perceptions may represent individuals’ accurate perceptions of relative embodied capital, or a mistaken impression driven by contextual (e.g., being typically surrounded by individuals with lower embodied capital) and/or psychological factors.

When interpreting the broad associations between perceived embodied capital and self-efficacy, those explanations invoking accurate self-perceptions and contextual/psychological factors might not be mutually exclusive. Perceptions should be influenced by both objective and subjective factors. The notion of accurate perceptions of embodied capital is bolstered by the relationships between objective and subjective measures of embodied capital. There are negative relationships between body fat percentage and self-perceived attractiveness and perceived physical ability. The perceived physical ability subscale of the physical self-efficacy scale was also associated with increased muscle percentage, a stronger grip, and a faster completion time on the peg task. Participants who scored higher on the verbal intelligence task rated themselves as more intelligent, attractive, emotionally skilled, and having more general self-efficacy
(Table 9). In summary, participants’ judgments of their self-efficacy and embodied capital are partially correlated with their objective embodied capital.

### 4.3 Hierarchical Multiple Regressions

The regression analyses significantly predicted all seven criterion variables (envy proper, personal relative deprivation, attraction-based envy, competence-based envy, benign envy, and malicious envy), with most of the explanatory power coming from physical self-presentation confidence (Tables 12 to 18). The first step introducing age and sex failed to account for variance in any of the criterion variables. The second step introducing objective indices of embodied capital uniquely predicted personal relative deprivation (Table 13). The third step introducing perceived embodied capital accounted for variance in envy proper above and beyond objective indices of embodied capital (Table 12). The final step introducing measures of self-efficacy accounted for unique variance in all seven criterion variables. Physical self-presentation confidence had a significant effect across all regression models.

#### 4.3.1 Objective indices of embodied capital

The hypothesis that objective indices of embodied capital would account for unique variance in feelings of disadvantage was only supported in one of the seven models (personal relative deprivation). The varied effects of objective embodied capital are surprising given that indices of objective embodied capital only had to account for variance beyond age and gender. Given the small effects of the demographic characteristics ($\Delta R^2$s = 0.01 to 0.05), significantly improving the model fit should not be a demanding task. The relative state model posits that relative state is at least in part informed by objective disadvantage; acting on perceptions that are uncorrelated with reality should impede fitness. As such,
the inconsistent relationships between objective indices of embodied capital and feelings of disadvantage must be examined further.

The inconsistent effects of objective embodied capital could have occurred for several reasons. The step introducing objective indices of embodied capital did not include any data regarding individuals’ facial attractiveness. Comparatively, perceived embodied capital and self-efficacy included some items that explicitly assessed individuals’ attractiveness. The absence of objective indices of facial attractiveness will be addressed once participants’ pictures are distributed to third parties to be evaluated for attractiveness. Additionally, objective indices of embodied capital could also be considered weak measures of their underlying constructs. For instance, strength and dexterity may be better assessed by full-body tasks, intelligence is better assessed by a comprehensive test, and body fat percentage is best measured using water displacement tanks. Future studies may find that more refined measures of embodied capital are better correlates of psychological outcomes.

The use of a voluntary undergraduate sample likely limited the variability of observed embodied capital for the current study. Individuals of low socioeconomic status (manifesting in poorer nutrition, less educational support, and developmental instability), are less likely to enter postsecondary education (Corack, Lipps, & Zhao, 2003). Thus, due to the selection bias favoring high SES individuals, an undergraduate sample may have generally higher levels of embodied capital compared to a community sample, and subsequently diluted the relationship between embodied capital and feelings of disadvantage. The voluntary nature of the current study may have also provided a means to bias the sample; the study was advertised as involving physical measurements.
Students with lower embodied capital (or those that were especially insecure about their embodied capital) may have preemptively opted out of the study. For these reasons, a community sample with greater variability in embodied capital (if an undergraduate sample does indeed represent a biased sample), may prove a better test of the hypotheses.

The concern of a biased undergraduate sample might be mitigated by the nature of social comparison processes. Even if an undergraduate sample has consistently higher and less variable embodied capital compared to the general population, these students’ social comparisons are likely directed towards other students. The notion that individuals compare themselves to similar others is a fundamental component of social comparison theory (Festinger, 1954), and has received empirical support (reviewed in Smith & Kim, 2007). Even if undergraduate students represent a curated segment of the population, with objectively higher levels of embodied capital, they should tend to make comparisons with other students, as these fellow students are likely to be available and similar to the comparator. Future studies should determine how assessments of ability, and the subsequent effects of ability-based assessments on feelings of envy, are influenced by individuals’ reference groups.

Perceived similarity has long been considered a crucial component of social comparisons (Festinger, 1954). However, the factors that determine perceived similarity have received only limited attention. The predominant theory in social psychology for explaining the role of similarity in social comparisons is the Self-Evaluation Maintenance model (Tesser, 1988; Tesser & Campbell, 1983). This model defines similarity those factors that foster “psychological closeness,” referring to the degree one perceives another as being “close” or “distant.” This psychological closeness is proposed to be
influenced by similarity in origins, physical proximity, age, looks, etc., resulting in social comparisons that are difficult to avoid (Tesser & Campbell, 1980).

The Self-Evaluation-Maintenance model fails to explain why similarity is so crucial to social comparisons. Given the importance of competition in maximizing biological fitness (Hamilton, 1964), judgments of similarity might be a proxy to help individuals identify potential competitors in an immediate environment. Consider Salovey and Rodin’s (1984) manipulation of similarity, participants received feedback that a subject next door had “superior performance” on a personality scale that purportedly either did or did not correspond to the participants’ stated career interests (e.g., medicine, business, performing arts). The authors could have chosen to manipulate similarity through other factors such as favorite musical genres, hometown, or desire to travel. Despite all the available domains of similarity, these authors decided to focus on career interests. The reliance on cues of occupational ambition suggests that people (or at least the authors) may judge similarity based on factors that facilitate access to contested mates, status, and resources. Theories in social comparison would benefit from further examination of the attributes that most impact perceptions of similarity.

Overall, objective indices of embodied capital were poor correlates of feelings of envy and personal relative deprivation. Only a handful of these objective measures were correlated with the criterion variables (Table 11), and fewer still uniquely improved the hierarchical regression models. However, some measures of embodied capital were stronger than others. Grip strength, height, and performance on the peg task were universally uncorrelated with feelings of envy and personal relative deprivation.
Body fat percentage was significantly correlated with envy proper, and verbal intelligence was significantly correlated with personal relative deprivation (Table 11). Moreover, verbal intelligence contributed unique variance in the final model explaining personal relative deprivation, and fat and muscle percentage accounted for unique variance in the final regression model explaining malicious envy. These results are suggestive of a small effect of objective embodied capital, even after controlling for perceived embodied capital and self-efficacy. The unique effect of objective embodied capital (particularly verbal intelligence) appears to be robust and unique when explaining personal relative deprivation. Further research is needed to investigate why the effects of these indices of embodied capital were limited to envy proper, personal relative deprivation, and malicious envy. The intercorrelations between objective and subjective measures of embodied capital suggest that participants were aware of how their embodied capital compared to other people. However, there may be certain aspects of one’s objective relative embodied capital that do not reach one’s consciousness, instead modifying psychological and behavioural process through implicit systems.

Muscle percentage was generally a poor correlate of feelings of disadvantage. Muscle percentage accounted for unique variance in malicious envy in the final regression model. However, the effect of muscle percentage on malicious envy was initially nonsignificant as a partial correlation $r = -0.13$, $p = 0.19$ (Table 11), and became a significant positive predictor of malicious envy. Such a stark change in effect may be attributed to statistical suppression (p. 49-51). However, a more parsimonious explanation may be multicollinearity: muscle percentage was entered in the same step as body fat percentage; these variables shared a strong relationship: $r = .85$, $p < .001$ (Table
7). However, the stark change in effect of muscle percentage failed to replicate in the other regression models.

Although there appears to be a null to suppression effect of muscle composition on feelings of disadvantage, stronger and more muscular individuals may react to and perceive their relative state differently. Petersen, Szyncer, Sell, Cosmides, and Tooby (2013) found that when disadvantaged, upper body strength was positively correlated men’s increased support for redistribution of wealth. Since formidability increases a person’s ability to impose costs on others, people who are more physically formidable may report becoming more frustrated when feeling materially disadvantaged (wealth-based envy), and could be more willing to harm the position of someone who is more advantaged (malicious envy). An interpretation focusing on the psychology of dominance and formidability is substantially weakened by the null correlations between of grip strength (controlling for age and gender) and these envious reactions. Further analyses on a larger sample of exclusively men, and variables focusing on formidability and dominance (dispositional dominance, muscle mass, voice pitch, etc.) would be a stronger test of the hypothesis that formidable individuals would be more likely to perceive disadvantage, and subsequently experience feelings of envy and relative deprivation.

4.3.2 Subjective embodied capital. Objective measures of embodied capital do not capture individuals’ perceptions of themselves. As an extreme example, body dysmorphic disorder is characterized by individuals’ distorted view bodily characteristics; an objectively strong individual could still perceive themselves to be especially weak. Subjective perceptions, which are imperfectly correlated with reality, should have a substantial role in guiding thoughts and behaviours. Perceived embodied
capital was only partly correlated with measures of envy and personal relative deprivation. Although perceived social skills and perceived emotional skills were associated with several of the criterion variables for instance, perceived intelligence was only associated with one of seven feelings of disadvantage (personal relative deprivation), and perceived attractiveness was only associated with envy proper (Table 11). Moreover, introducing perceived embodied capital only improved the regression model explaining envy proper. In sum, the results largely fail to support the prediction that perceived embodied capital would uniquely account for feelings of envy and relative deprivation; the step that reached statistical significance may simply be the result of Type I Error. 

The null to small effects of perceived embodied capital on feelings of disadvantage could have manifested because ratings of perceived embodied capital did not specifically invoke competitors. Participants were asked to rank themselves on certain traits compared to other people, but these assessments were not framed in relation to their competitive context. For instance, participants were asked to rate their attractiveness. However, these assessments of relative attractiveness were not portrayed as being immediately relevant to fitness-related challenges (i.e., sexual access). Future studies may be more likely to find significant associations between perceived embodied capital and feelings of disadvantage if these assessments are clearly framed in relation to salient competitors and relevant outcomes (e.g., “rate your overall attractiveness compared to those who would be most likely be interested in your ‘type’ of romantic partner”).

Of the five factors of perceived embodied capital, perceived emotional skills, was surprisingly the most consistent correlate of feelings of disadvantage, being significantly
correlated with envy proper, personal relative deprivation, attraction-based envy, and malicious envy (Table 11). As an underlying factor, perceived emotional skills may represent emotional reactivity to a certain degree, as the items include questions on emotional intelligence and stability. The relatively robust correlations between perceived emotional skills and feelings of disadvantage may be explained by negative affect; participants that consistently felt disadvantaged likely felt more stress and negative emotions (Beshai et al., 2017, Callan et al., 2015), and may have consequently behaved less patiently, deliberately, or with less “common sense.” Despite its partial correlations with feelings of disadvantage, perceived emotional skills failed to contribute unique variance to any of the seven regression models. Although perceived emotional skills emerged as a distinct factor using principal axis factoring, the results, the negligible unique impact of perceived emotional skills suggests that this factor shares substantial variance with other independent variables. Indeed, perceived emotional skills were associated with every measure of perceived embodied capital and self-efficacy, except for the perceived physical ability subscale of the physical self-efficacy scale.

Despite not accounting for incremental variance when initially introduced, perceived attractiveness had a significant positive effect on malicious envy in the final model (the opposite direction as predicted). Self-perceived attractiveness was not significantly correlated with malicious envy (Table 8), and reached significance only in the final step (in the third model, self-perceived embodied capital had a $b = .88, p = .17$). The effect of self-perceived attractiveness on malicious envy is surprising both empirically and theoretically (being in the opposite direction as predicted), and is examined below.
When explaining malicious envy, the significance of perceived attractiveness (Table 16) solely in the final regression model is indicative of classical statistical suppression (also known as enhancement; Friedman & Wall, 2005). Although perceived attractiveness has a nonsignificant correlation with malicious envy (Table 11), its inclusion with measures of self-efficacy may have improved the observed effects by removing irrelevant variance from the measures of self-efficacy, allowing the ‘true’ explanatory power of self-efficacy to be uncovered. The extraneous variance manifests in perceived attractiveness’s positive \( b \)-value.

The correlations between perceived embodied capital and measures of self-efficacy (Table 8) raise the possibility that suppression is the result of excessive multicollinearity within the model (e.g., Beckstead, 2012). However, only gender and grip strength had VIFs above 4, suggesting that multicollinearity was within acceptable limits (VIF < 4 being a conservative criterion; Pan & Jackson, 2008, but see O’Brien, 2007 for a review on how VIF criteria can be relaxed when considered in the context of sample size and confidence intervals).

The presence of suppression indicates that perceived attractiveness should not be discarded from the model based on its null association with malicious envy. Rather, perceived attractiveness provides the means to clarify the existing effects of general self-efficacy and physical self-presentation confidence (more generally, the possibility of suppressor effects suggests that otherwise nonsignificant correlates can still improve a model’s \( R^2 \) by “carving out” irrelevant variance from significant variables). The possibility of statistical suppression indicates that researchers should be mindful when
confronted with null correlations, as the variables involved may help refine future models as suppressor variables.

Perceived attractiveness may have emerged as a suppressor variable because perceived attractiveness was consistently and strongly associated with measures of self-efficacy, while also having a nonsignificant association with malicious envy (Tables 8 and 11). Perceived attractiveness also appeared to have had a suppression effect on personal relative deprivation, having a null partial correlation with the criterion, but uniquely contributing to the final regression model. Malicious envy and personal relative deprivation may have been the only criterion variables to be subjected to the suppression effect because neither malicious envy nor personal relative deprivation had significant partial correlations with perceived attractiveness, while having significant relationships with both general self-efficacy and physical self-presentation confidence. Future studies should determine why the variance shared between perceived attractiveness and self-efficacy was so cleanly separate from malicious envy and personal relative deprivation as to lead to a suppression effect.

4.3.3 Self-Efficacy. Accounting for a significant amount of variance across all seven regression analyses ($\Delta R^2$s = 0.08 to 0.23), introducing self-efficacy into the regression models was a surprisingly useful step. The hypothesis stated that self-efficacy may account for incremental variance above and beyond perceived embodied capital, as someone’s confidence in their abilities should be informed by the belief that they have embodied capital to leverage (as seen in Table 7). However, self-efficacy’s explanatory power was widespread and unique from perceived embodied capital, to the point that controlling for indices of perceived embodied capital increased self-efficacy’s ability to
explain malicious envy and personal relative deprivation. Although the direction of self-efficacy’s effects on envy and personal relative deprivation were predicted, the magnitude of some of these effects demands further examination.

4.3.3.1 General self-efficacy. General self-efficacy was negatively correlated with five of the seven criterion variables (i.e., all but competence-based and benign envy, Table 11). However, general self-efficacy accounted for unique variance only the regression model explaining malicious envy. These results provide mixed support for the hypothesis that self-efficacy would add significant variance when explaining feelings of disadvantage. These varying effects are explored below.

General self-efficacy was not significantly associated with benign envy, and failed to contribute unique variance to the regression model explaining benign envy. The null effect of general self-efficacy on benign envy suggests that confidence in one’s ability is not a substantial part of benign envy. Given the relative novelty of empirical work examining benign envy, future studies should investigate whether self-efficacy moderates the effects of disadvantage on benign envy.

General self-efficacy had nonsignificant (competence-based envy) to small (attraction- and wealth-based envy) relationships with domain-specific envy, and failed to reach significance in the hierarchical regression models explaining the above criterion variables. The inconsistent relationships between general self-efficacy and domain-specific envy are in stark contrast to the large effect of general self-efficacy on envy proper (Table 11). Such divergence in effects is interesting given the interrelatedness between the Dispositional Envy Scale and the three measures of domain-specific envy (Table 6).
The variance shared between the Dispositional Envy Scale and domain-specific measures of envy appears to have little overlap with general self-efficacy. Indeed, after controlling for age, gender, and all three subscales of domain-specific envy, envy proper still had a moderate-strong correlation with general self-efficacy, \( r = -0.39, p < .001 \). Given the supposed domain-generality of envy proper and general self-efficacy, one would expect for domain-general variables to share variance in the discrete domains of attraction, wealth, and competence. The domain-specific measures of envy all correspond to proxies of fitness, which would presumably be personally-relevant enough to share variance with general measures of envy and self-efficacy. However, competitive disadvantage in such specific domains may be unaffected by such a broad construct as general self-efficacy. Alternatively, subscales of the Domain-Specific Envy Scale may fail to effectively portray the domain-specificity of envy (S. Mishra, personal communication, July 18, 2017). The notion of domain-specificity in the study of envy is still novel. As such, future studies should seek to test whether envy feelings can indeed be broken into discrete functional domains, and whether the items of the Domain-Specific Envy Scale effectively capture these areas. Afterwards, future studies should examine whether general self-efficacy indeed fails to explain objective indices of relative standing in the domains of attraction, wealth, and competence.

**4.3.3.2 Perceived physical ability and social self-efficacy.** Perceived physical ability was a null correlate of all feelings of disadvantage (Table 11). Perceived physical ability was associated with lower body fat percentage, higher muscle percentage, higher grip strength, and faster completion of the peg task (Table 9). Thus, perceived physical ability appears to be at least partly influenced by real indices of physical ability.
However, its null associations with feelings of envy and personal relative deprivation casts doubt on the importance of physical attributes in understanding feelings of disadvantage, or competitive (dis)advantage more generally. The average undergraduate student in an industrialized society likely only seldom relies on physical ability, and might not be psychologically affected by their relative athletic ability. Future studies may benefit from focusing on samples that rely on physical skill to gain access to proxies of fitness (e.g., hunters, athletes). In these populations, perceived physical ability may be a significant predictor of feelings of envy and personal relative deprivation. Future studies should also investigate why perceived physical ability was associated with feelings of personal relative deprivation, but not any other measure of envy.

Social self-efficacy was negatively correlated with envy proper, wealth-based and malicious envy, as well as personal relative deprivation. In the following regression analyses, social self-efficacy accounted for a small, but significant amount of unique variance in envy proper (Table 12). However, social self-efficacy failed to explain variance in other feeling of disadvantage after controlling for objective and subjective embodied capital. Developing strong cooperative relationships is an important predictor of biological fitness in social species such as humans (reviewed in Silk & House, 2011). Moreover, under constrained time, energy, and resources, individuals must be selective with whom they form relationships, forcing individuals to compete for more desirable social partners (reviewed in Barclay, 2016). Given the competitive markets surrounding social and sexual partners, social skills are important predictors of gaining access to these desirable goods (e.g., Crawford & Manassis, 2011). In addition to being negatively correlated with envy proper (as seen in Table 11), one might expect that social self-
efficacy would be more important than the subscales of the physical self-efficacy scale (as many individuals in an industrialized society spend more time being social than physical). However, social self-efficacy captures individuals’ confidence in their ability to perform specific social tasks, such as asking someone out for coffee. These items fail to capture how individuals believe they will be perceived by others. Although social self-efficacy appears to have a small unique effect on envy proper, physical self-presentation confidence may better capture the competitive and threatening nature of social interactions, at least as they pertain to feelings of envy and relative deprivation.

4.3.3.3 Physical self-presentation confidence. The physical self-presentation confidence subscale of Ryckman et al. (1982)’s Physical Self-Efficacy Scale was the strongest correlate of every single criterion variable, except for personal relative deprivation. The large and universally negative effect of physical self-presentation confidence on feelings of envy and relative deprivation suggests that physical self-presentation confidence may capture a characteristic that is common to all feelings of disadvantage that has not been examined before. However, the relationship between physical self-presentation confidence and all measures of envy and relative deprivation can be puzzling. Consider the role of physical self-presentation confidence in wealth-based envy. Especially in an undergraduate sample, one would not expect that physical self-presentation confidence impacts one’s access to wealth (physical self-presentation confidence was not associated with personal or household income, $p_s = 0.53$ and $0.51$, respectively). Physical self-presentation confidence’s role in accounting for variance across all measures of envy (and personal relative deprivation to a lesser extent) may lie in the importance of social evaluation processes in competitive contexts.
Individuals appear to recognize that physical self-presentation is especially important in specific scenarios. Martin and Mack (1996) tested whether there are gender differences in how physical self-presentation confidence affects competitive anxiety in sport. The authors reasoned that if sport encourages females to emphasize physical appearance (compared to men, who only need to focus on physical skill; MacNeill, 1988), “self-presentation doubts should be a source of sport competition anxiety [for women], just as doubts about performance are a source of anxiety” (p. 76). Indeed, the authors found that, in women but not men, lower physical self-presentation confidence was associated with greater anxiety in sport competition. Thus, the effect of physical self-presentation confidence on competition-related emotions appears when self-presentation is a perceived determinant of successful competition.

Similarly, most competitive contexts for humans depend on some sort of social evaluation, whether in romantic pursuits or professional interviews. If social evaluations are indeed an important input into feelings of envy and personal relative deprivation, one might expect that social self-efficacy would be stronger correlate than physical self-presentation confidence, given the importance of being able to successfully make and maintain social connections. However, in the multiple regression analyses, physical self-presentation confidence had a larger and more consistently significant effect on feelings of disadvantage than social self-efficacy. As such, self-presentation confidence appears to better represent the competitive nature of attracting desirable social and romantic partners than social self-efficacy. While physical self-presentation confidence sometimes explicitly assesses individuals’ value relative to others (e.g., “I am sometimes envious of those better looking than myself”), social self-efficacy assesses one’s confidence in their
ability to engage in tasks to initiate and maintain relationships (e.g., “put yourself in a new and different social situation”). Thus, self-presentation confidence may better approximate one’s confidence when interfacing with these competitive markets, and is therefore a stronger predictor of feelings of envy and personal relative deprivation than social self-efficacy.

Although the items of the physical self-presentation confidence subscale explicitly and exclusively focus on physical characteristics and skills, they may represent an underlying factor: one’s confidence when encountering consequential social evaluations. There are factors beyond physiological attributes that can affect social evaluations, such as intelligence, experience, fashion (reflecting financial capital), and reputation (reflecting social capital). The belief that one lacks the capital to receive favorable social evaluations may manifest in feelings of disadvantage across multiple domains, but only to the extent that success in the relevant domains relies on effective self-presentation. For instance, physical self-presentation confidence may have been associated with wealth-based envy because wealth allows individuals to improve their social evaluations through purchasing of status goods (reviewed in Nelissen & Meijers, 2011). Physical self-presentation confidence was not associated with personal nor household income in the current sample, weakening the interpretation that physical self-presentation confidence may also capture wealth-based presentation confidence. Future studies should investigate whether self-presentation confidence mediates relationships between the possession of capital, embodied or otherwise, and feelings of envy and relative deprivation.
4.3.3.4 Self-efficacy summary. The role of self-efficacy in explaining feelings of envy and personal relative deprivation should be interpreted considering the criticisms of the scales used in the current study. Bandura (2012) has specifically criticized both the general (Chen et al., 2001) and physical (Ryckman et al., 1982) self-efficacy scales. Bandura argues that efficacy beliefs must be specific to the activities and goals that individuals are pursuing. He criticizes the General Self-Efficacy Scale for its decontextualized and indefinite items (e.g., “perform effectively on different tasks”), and its occasional use of intentional statements (“I will” versus the more appropriate “I can”). Bandura goes on to criticize the physical self-efficacy scale, asserting that it, among other scales, “assesses the cognitive, motivational, affective, decisional, and behavioral effects of self-efficacy rather than peoples’ beliefs in their capabilities” (2012; p. 19-18).

Bandura’s criticisms of the General Self-Efficacy Scale have two principal implications: firstly, envy proper might be better explained by more specific forms of self-efficacy (as demonstrated by self-presentation confidence, but see below); secondly, the confounding of efficacy (“I can”) and intentional (“I will”) statements means that the relationship between general self-efficacy might not precisely reflect one’s confidence in their capacity to carry out tasks, but rather confidence in tasks being accomplished (which could be attributed to third parties). The confounding of efficacy and intention could have implications for judgments of fairness; if individuals attribute their inability to accomplish tasks to external factors, they should be more likely to perceive unfairness, and subsequently experience greater envy. Such semantic subtleties may have little bearing on the interpretations of general self-efficacy in the current study, but future
researchers should be mindful of the above criticisms as more refined measures of self-efficacy become available.

Bandura’s claim of confounds within the physical self-efficacy scale is especially relevant for the current study. The physical self-presentation confidence subscale simultaneously assesses individuals’ comfort in presenting their physical characteristics ("I am rarely embarrassed by my voice"), social feedback ("athletic people usually do not receive more attention than me"), accident-proneness ("I find that I am not accident-prone"), and stress reactivity ("sometimes I don’t hold up well under stress"). Moreover, self-presentation confidence has an item that explicitly taps into an envious reaction ("I am sometimes envious of those better looking than myself"). The substantial explanatory power of self-presentation confidence across models may be partly attributable to confounds within the measure. The items seldom explicitly assess participants’ confidence in carrying out specific self-presentation tasks. Instead, physical self-presentation confidence appears to be an amalgamation of variables surrounding one’s self-presentation. The intra-scale heterogeneity can be seen to compromise the measures integrity via a low Cronbach’s alpha of .69. Consequently, future research is needed to precisely specify the role of physical self-presentation confidence in explaining envy and personal relative deprivation.

As mentioned above, the Physical Self-Efficacy Scale has been criticized by Bandura (2012) for confounding self-efficacy with its effects. By Bandura’s standards, the Scale of Perceived Social Self-Efficacy is a clearer measure of self-efficacy, assessing confidence in one’s ability to carry out discrete social tasks. Given the specificity of social self-efficacy, the current study may have been underpowered to detect its effect
Moreover, even with a larger sample size, the effect of social self-efficacy would have likely still been overshadowed by a more complex variable such as physical self-presentation confidence.

The limitations of the current self-efficacy measures must be considered against self-efficacy’s usefulness in accounting for variance in envy even after controlling for objective and subjective indices of embodied capital. Bandura (2012) asserted that “there is a marked difference between possessing knowledge and skills and being able to use them well under diverse circumstances, many of which contain ambiguous, unpredictable, and stressful elements” (p. 24). According to Bandura’s perspective, embodied capital represents a set of tools that help individuals meet fitness-related goals, but such traits and abilities must be effectively wielded.

Measures of self-efficacy were inconsistently, and then only moderately, correlated with indices of embodied capital. Thus, self-efficacy is only partly informed by someone’s possession of embodied capital. Bandura (2012) describes four sources of self-efficacy: mastery experiences, social modeling, social persuasion, and physical/emotional states. Future studies should focus on whether embodied capital influences these antecedents of self-efficacy. Mastery experiences may prove to be the most sensitive to embodied capital. Those who have embodied capital relevant to immediate tasks should be the most likely to experience mastery in these tasks (e.g., a smart person experiencing mastery in an intellectually demanding task).

The other sources of self-efficacy may also be influenced by embodied capital. Those who are higher in embodied capital may be increasingly exposed to strong social models and social persuasion attempts; for instance, intelligent students are often put in
advanced programs, being exposed to similarly talented peers, and receiving greater support to be resilient and persistent in the face of academic challenges (although these programs may also serve to foster feelings of envy and personal relative deprivation, as with repeated interactions these talented peers can become individuals’ new reference group). Lastly, people with higher embodied capital may experience more favorable physical and emotional states, which in turn foster judgments of self-efficacy. Indeed, using a longitudinal design, Koenen et al. (2009) found that childhood IQ is negative predictor of a variety of mental illnesses at age 32 (except for IQ’s positive relationship with mania). Given the utility of self-efficacy in explaining feelings of disadvantage, future studies should assess the role of embodied capital in the etiology of self-efficacy.

4.5 Disposition or Repeated Situational Evocation?

One underlying assumption of the current study is that measures of envy and personal relative deprivation capture a barometer of individuals’ competitive (dis)advantage. The measures of envy and personal relative deprivation capture individuals’ tendencies to feel upset about a given disadvantage, and individuals’ affective and motivational responses to the perceived disadvantage. However, the tendency to be upset about a perceived disadvantaged might not be the result of individuals’ objective disadvantage. Rather, measures such as the Dispositional Envy Scale may assess a personality construct rather than individual’s general feelings of envy and personal relative deprivation.

The ambiguity within measures of envy and personal relative deprivation raises the question of what causes a person to be prone to feelings of disadvantage. Consider the items of the Dispositional Envy Scale (e.g., “I feel envy every day”). Regular feelings of
envy may be the consequence of constant exposure to cues of disadvantage. Alternatively, individuals may habitually feel envious because of a stable (i.e., trait) tendency to become discontent in the face of unfavorable social comparisons. The confounding of disposition and repeated situational evocation is common throughout social and personality psychology. Consider the two-week test-retest reliability of the Dispositional Envy Scale, $r = .80$ (Smith et al., 1999). Such statistics are insufficient to discern the cause of temporal stability. Considering the historically low levels of social mobility (Clark, 2014), dispositional measures of envy might effectively capture individuals’ responses to objective and persistent disadvantage. Future research should investigate whether stability in measures of envy and relative deprivation can be accounted for by heritability, and whether the effect of heritability persist after controlling for indices of embodied capital.

4.4 Potential Moderators

The current study found a substantial main effect perceived embodied capital and self-efficacy on feelings of disadvantage. However, perceptions of embodied capital and self-efficacy may only influence feelings of disadvantage in certain individuals and circumstances. These potential moderating variables are explored below.

Social comparison appears to be positively associated with feelings of disadvantage (Callan, Kim, & Matthews, 2015a). Thus, individuals higher in social comparison orientation may report greater envy and relative deprivation when possessing (or perceiving themselves to have) lower embodied capital. By comparison, people who are lower in social comparison orientation may be relatively unaffected by lower embodied capital. Additionally, a larger sample with more equal numbers of men and
women may find that men and women’s feelings of envy and relative deprivation are differentially affected by discrete forms of embodied capital. For instance, cross-culturally, men tend to prefer characteristics signaling reproductive capacity in their sexual partners, whereas women tend to prefer partners to possess cues signaling resource acquisition (Buss, 1989). Thus, in self-assessments, men may be more sensitive to forms of embodied capital that reflect resource acquisition, such as intelligence or physical ability, whereas women may be more sensitive to indices of reproductive capacity, such as physical attractiveness.

Given the importance of fairness in envy and relative deprivation, future studies may benefit from studying whether embodied capital impacts judgments of fairness. Eisenbruch and Roney (2017) found that when individuals are paired with a stingy, but productive partner, participants are more likely to be more grateful and less angry (the authors interpreted these measures as a rating of fairness) than they would be with a stingy, but unproductive partner. In order to continue benefitting from the productivity of desirable partners, individuals appear to treat productive partners as though they are entitled to greater selfishness.

The fact that individuals are more willing to make concessions to desirable partners suggests that individuals with higher embodied capital have more bargaining power in social interactions. The greater power that comes with being a “productive” partner may cause those with higher embodied capital to feel that they deserve more benefits stemming from cooperation. Heightened perceptions of deservingness may cause people with high embodied capital to be more likely to perceive disadvantage (and believe that the disadvantage is unfair). Some research is suggestive of the role of ability
in reacting to disadvantage: Boen and Vanbeselaere (2000) found that when in a low-status group, high ability individuals are more likely to try to abandon the low-status group in an attempt to enter a high-status group. Additionally, Ku and Salmon (2012) found that when wealth distribution is determined by superior performance, wealthier individuals preferred that their poorer partners transferred more money to themselves in a public goods game than when advantage was determined randomly. The evidence suggests that perceptions of ability may systematically change individuals’ reactions to advantage or disadvantage.

4.5 Test of the Relative State Model

Although correlational data prevents inferences of causality, the current study provides partial support for a crucial hypothesis of the relative state model (Mishra et al., 2017): that embodied capital affects barometers of relative state. Objective indices of embodied capital were nonsignificant correlates of domain-specific, as well as benign and malicious envy. Handedness on the peg task was positively correlated with envy proper, but failed to account for unique variance in the final regression model. Personal relative deprivation was negatively correlated with verbal intelligence, with the introduction of objective indices of embodied capital significantly improving the model’s ability to explain variance in personal relative deprivation.

The effects of objective embodied capital on feelings of disadvantage were surprisingly small and inconsistent. Embodied capital, alongside environmental factors, is argued to be one of the only determinants of an individual’s overall competitive (dis)advantage. As such, one would expect that objective embodied capital would have large and widespread effects on feelings of envy and relative deprivation. For instance,
given the general utility of intelligence, an objectively intelligent person would be expected to feel less envious across domains due to her persistent advantage. By contrast, the results indicated that the effect of objective embodied capital was constrained to only a few measures of envy and relative deprivation. As mentioned earlier, the inconsistent ability of objective embodied capital to explain relevant social comparison reactions could be attributed to the use of an undergraduate population and limited measures of embodied capital. If the limited effects of objective embodied capital persist with improved samples and methodologies (e.g., examining the effects of body composition, intelligence, and hunting ability in ancestral populations), the relative state model may need to be revised to appropriately weight embodied capital’s effect on relative state.

Compared to objective indices of embodied capital, self-efficacy and perceived embodied capital were generally stronger correlates of feelings of envy and relative deprivation. The increased utility of subjective measures reiterates that relative state is a subjective computation of competitive (dis)advantage. Although one’s absolute state (e.g., embodied capital, current wealth) can be objectively quantified, cues of relative state must be subjectively integrated by the decision-maker. Throughout the assimilation and interpretation of status cues, absolute state is contextualized by numerous factors, most notably social comparisons. Since self-report measures necessarily capture subjective ratings, subjective ratings are better approximations of relative state than objective and “unbiased” measures. If the current study only examined objective indices of embodied capital, the (erroneous) conclusion would have been that individuals are not very affected by how their skills, traits and abilities compare to others. Thus, future
studies investigating relative state (as well as the behavioural sciences more generally) will benefit from pairing subjective and objective measures in their methodologies.

4.6 Future Directions

Inequality is a common issue in organizations; limited resources and positions are contested by multiple parties, and can seldom be distributed completely equally (e.g., promotions, corner offices). The psychology of relative state can have profound implications for the efficacy and well-being of employees; envy proper is associated with greater workplace deviance (Kim et al., 2013). Thus, understanding the antecedents of feelings of disadvantage may have a substantial role in crafting effective organizations.

The current study found that indices of subjective embodied capital and self-efficacy effectively explained feelings of disadvantage, while objective measures of embodied capital had largely negligible relationships with feelings of envy. The results of the current study suggest that organizations may effectively reduce feelings of disadvantage through psychological interventions, rather than focusing on improving individuals’ objective embodied capital. For instance, consider an individual who is feeling less competent than their peers in a workplace. The ensuing feelings of disadvantage could potentially be mitigated by moving the individual in question to a new unit. Since social comparisons are most envy-inducing when the involved parties are judged to be similar, feelings of disadvantage might be best mitigated by moving the envious person into a new group of peers that are distinct in their skill sets. Although moving the envious individual does not necessarily increase their embodied capital, such displacement should change the envious person’s reference group. Changing the reference group to individuals that are distinct in their skill sets might hamper
individuals’ tendencies to categorize people as “better” or “worse.” In addition to intervening at the psychological level, worker displacement would also likely be far less expensive than investing in that employee’s professional development or hiring and training a new employee. By considering the importance of perceived embodied capital, organizations might effectively and efficiently prevent feelings of disadvantage, and subsequent outcomes such as workplace delinquency.

According to the relative state model, embodied capital should only be one input into relative state; perceptions of a disadvantaged relative state are also a product of environmental factors, such as inequality. Higher inequality increases the stakes of competition; when winners capture increasingly sizable portions of desired rewards, “winning” becomes especially important. As such, the effect of perceived embodied capital on feelings of envy and relative deprivation may be moderated by perceived environmental inequality. Future studies may find that individuals who have (or perceive themselves to have) low embodied capital will experience less feelings of envy and relative deprivation in more equal environments. Similarly, by reducing inequality within an organization, employers may be able to alleviate feelings of envy experienced by those who believe they are disadvantaged.

Future studies should assess whether there are instances when an absence of embodied capital is not envy inducing. Deficits in embodied capital do not always impair fitness: Stephen Hawking has severe motor impairments, but has still achieved significant prestige due to his intelligence (and has even fathered three children). Potentially, individuals do not need to be high in all forms of embodied capital so long as they are high in at least one type of embodied capital.
The notion that individual forms of embodied capital may be given disproportionate weighting in assessments of relative state can be in part explained by social differentiation: the process of individuals distinguishing themselves from others (Lemaine, 1974). Evolutionary theory posits that social differentiation (and niche selection) exists to reduce competition over resources: the individual who enjoys the food source that other individuals dislike should have increased fitness (reviewed in Lemaine, 1974). Embodied capital may be an important determinant of social differentiation. Individuals might attempt to structure their environments (and create self-concepts) to be most consistent with their existing forms of embodied capital: smart people should dedicate time and effort to domains that require intelligence, and strong people should choose activities that showcase strength. Specializing reduces individuals’ need to compete in similar domains. However, specializing also reduces flexibility; after opting out of some strategies, being a successful competitor in the chosen domain of functioning becomes especially necessary for improving fitness. People should be most affected by status in domains that is relevant to their embodied capital, and less affected by embodied capital that is not relevant (for instance, graduate students would probably be more affected by information suggesting lower relative intelligence or knowledge, compared to information suggestive of less relative physical strength). Future studies should test whether individuals who are high in one form of embodied capital still have envious reactions to deficits in other types of embodied capital.

Future studies would also benefit from determining the effect of modifications to embodied capital. Individuals can change embodied capital to some degree: people can diet and exercise, pursue an education, and undergo cosmetic surgery. Alleviating
environmental inequality can reduce risk-taking (Mishra et al., 2015), but little data exists on the effects of reducing inequalities in competitive ability. Individuals who seek and receive cosmetic surgery generally report better mood, increased self-confidence, increased popularity, and feelings of sexual well-being (e.g., Kamburoğlu, & Özgür, 2007; McCarthy et al., 2012). The existing research suggests that increasing embodied capital may alleviate some psychological distress.

Alternatively, individuals who engage in intense self-investment may shift reference groups, and in turn be unsatisfied with the adjusted relative position. For instance, after schooling, doctors accrue far more money and social status than most individuals. However, if comparing themselves to other medical professionals, doctors may focus on how other physicians make even more money, or work in more prestigious specializations. Likewise, individuals who undergo cosmetic surgery might begin make comparisons with only the most attractive individuals, or with people who have also undergone cosmetic surgery. If individuals indeed shift their reference groups following increases in embodied capital, individuals may come to feel more disadvantaged, despite improving their objective standing. People that manage to improve their absolute state may still experience poor psychological outcomes. Future studies may find that psychological outcomes (e.g., job satisfaction) following modifications to embodied capital are mediated by feelings of envy and relative deprivation.

6.0 Conclusion

Past studies have considered envy and personal relative deprivation as downstream affective consequences of environmental inequality. The current study is the first empirical work suggesting that individuals’ (perceived) embodied capital has links to
feelings of disadvantage. Thus, feelings of envy and relative deprivation are not only influenced by inequality in resources and outcomes. As hypothesized by the relative state model, people are sensitive to both situational and embodied indices of competitive (dis)advantage, and react accordingly. Investigations of envy and relative deprivation, and social psychology more generally, have historically focused on the power of the situation on the individual. The results of the current study suggest that competitive ability and the psychology of relative state may be useful across the behavioural sciences.
References


Novakowski, D., & Mishra, S. (under review). Relative deprivation and the Big Five and HEXACO personality traits.


Appendix A

Demographics

Age: _________________________

Gender: Male  Female  Other

Major (if applicable): _____________________________________________

Please indicate your current relationship status:

- [ ] Single
- [ ] Dating
- [ ] Married or cohabitating
- [ ] Separated or divorced
- [ ] Widowed

How many children do you have?

What is the highest level of education you have completed?

- [ ] None
- [ ] Elementary/primary
- [ ] High school
- [ ] Some college/university
- [ ] College/university
- [ ] Graduate/post-graduate (Masters)
- [ ] Professional (e.g., JD, MBA, MD)
- [ ] Doctoral (PhD)

How many siblings do you have?

Older brothers_______  Younger brothers_______  Older sisters_______  Younger sisters_______

How many siblings do you have that are biologically related to you through your mother:

Older brothers_______  Younger brothers_______  Older sisters_______  Younger sisters_______

Which hand do you use predominately to write with?

Left  Right

What is your current job status?
• Employed full time
• Employed part time
• Previous employed, but not currently employed
• Never employed
• Retired

If employed, what is your current position/title? __________

What is the total amount of money your family household earned last year?
Less than $10,001 to $20,001 to $30,001 to $40,001 to $50,001 to $75,000 to More than
$10,000 $20,000 $30,000 $40,000 $50,000 $75,000 $100,000

How much money did you personally earn last year?
Less than $10,001 to $20,001 to $30,001 to $40,001 to $50,001 to $75,000 to More than
$10,000 $20,000 $30,000 $40,000 $50,000 $75,000 $100,000

Have you ever been arrested?
Yes No
If yes, at what age were you first arrested? ________

Have you ever been charged with a crime?
Yes No
If yes, at what age were you first charged with a crime? ________

Have you ever been convicted or found guilty of committing a crime?
Yes No
If yes, at what age were you first convicted of a crime? ________

Have you ever been incarcerated?
Yes No
If yes, at what age were you first incarcerated? ________
If yes, what is the longest time period that you were incarcerated? (in years OR months) Years Months

Have you been diagnosed with a mental illness?
If so, what kind? __________
Appendix B

Peg Test

Participants are instructed to move the pegs from the dish to the 9 holes and then return them back into the container as quickly as possible.

“Pick up the pegs one at a time, using your right (or left) hand only, and put them into the holes in any order until the holes are filled. Then, remove the pegs one at a time and return to the container. Stabilize the peg board with your left (or right) hand. This is a practice test. See how fast you can put all of the pegs in and take them out again. Are you ready? GO!!”
Appendix C

Hand grip strength

(1) Sit the participant comfortably in a standard chair with legs, back support and fixed arms. Use the same chair for every measurement. (2) Ask them to rest their forearms on the arms of the chair with their wrist just over the end of the arm of the chair—wrist in a neutral position, thumb facing upwards. (3) Demonstrate how to use the Jamar handgrip dynamometer to show that grip-ping very tightly registers the best score. (4) Start with the right hand. (5) Position the hand so that the thumb is round one side of the handle and the four fingers are around the other side. The instrument should feel comfortable in the hand. Alter the position of the handle if necessary. (6) The observer should rest the base of the dynamometer on the palm of their hand as the subject holds the dynamometer. The aim of this is to support the weight of the dynamometer (to negate the effect of gravity on peak strength), but care should be taken not to restrict its movement. (7) Encourage the participant to squeeze as long and as tightly as possible or until the needle stops rising. Once the needle stops rising the participant can be instructed to stop squeezing. (8) Read grip strength in kilograms from the outside dial and record the result to the nearest 1 kg on the data entry form. (9) Repeat measurement in the left hand. (10) Do two further measurements for each hand alternating sides to give three readings in total for each side. (11) The best of the six grip strength measurements is used in statistical analyses so as to encourage the subjects to get as high a score as possible. (12) Also record hand dominance, i.e., right, left or ambidextrous (people who can genuinely write with both hands).
## Appendix D

### Verbal intelligence task

Find match for underlined word

<table>
<thead>
<tr>
<th>Example:</th>
<th>afraid</th>
<th>words</th>
<th>large</th>
<th>Animal (match)</th>
<th>separate</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beast</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Space</td>
<td>school</td>
<td>noon</td>
<td>captain</td>
<td>room</td>
<td>board</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>Broaden</td>
<td>efface</td>
<td>make level</td>
<td>elapse</td>
<td>embroider</td>
<td>widen</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>Emanate</td>
<td>populate</td>
<td>free</td>
<td>prominent</td>
<td>rival</td>
<td>come</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>Edible</td>
<td>auspicious</td>
<td>eligible</td>
<td>fit to eat</td>
<td>sagacious</td>
<td>able to speak</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>Animosity</td>
<td>hatred</td>
<td>animation</td>
<td>disobedience</td>
<td>diversity</td>
<td>friendship</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>Pact</td>
<td>puissance</td>
<td>remonstrance</td>
<td>agreement</td>
<td>skillet</td>
<td>pressure</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>Cloistered</td>
<td>miniature</td>
<td>bunched</td>
<td>arched</td>
<td>malady</td>
<td>secluded</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>Caprice</td>
<td>value</td>
<td>A star</td>
<td>grimace</td>
<td>whim</td>
<td>inducement</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>Accustom</td>
<td>disappoint</td>
<td>customary</td>
<td>encounter</td>
<td>get used to</td>
<td>business</td>
<td>Don’t Know</td>
</tr>
<tr>
<td>Allusion</td>
<td>reference</td>
<td>dream</td>
<td>eulogy</td>
<td>illusion</td>
<td>aria</td>
<td>Don’t Know</td>
</tr>
</tbody>
</table>
Appendix E

Omron Fat Loss Monitor HBF 306C

Records body fat % and Body Mass Index
Appendix F

Ozeri Touch 440lbs Total Body Bath Scale

Records weight, body fat %, hydration %, muscle %, and bone mass
Appendix G

Self-Perceived Embodied Capital Scale

If you were one of ten people to perform a general strength test, which one would you be?

<table>
<thead>
<tr>
<th>Weakest</th>
<th>Strongest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  2  3  4  5  6  7  8  9</td>
<td>10</td>
</tr>
</tbody>
</table>

If you were one of ten people to perform the hand grip strength test, which one would you be?

<table>
<thead>
<tr>
<th>Weakest</th>
<th>Strongest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  2  3  4  5  6  7  8  9</td>
<td>10</td>
</tr>
</tbody>
</table>

If you were one of 10 people to test your coordination/dexterity, which one would you be?

<table>
<thead>
<tr>
<th>Least Coordinated</th>
<th>Most coordinated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  2  3  4  5  6  7  8  9</td>
<td>10</td>
</tr>
</tbody>
</table>

If you were one of 10 people to have your physical attractiveness evaluated, which one would you be?

<table>
<thead>
<tr>
<th>Least Attractive</th>
<th>Most attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  2  3  4  5  6  7  8  9</td>
<td>10</td>
</tr>
</tbody>
</table>

If you were one of 10 people to have your overall attractiveness (including personality, skills, etc.) evaluated, which one would you be?

<table>
<thead>
<tr>
<th>Least Attractive</th>
<th>Most attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  2  3  4  5  6  7  8  9</td>
<td>10</td>
</tr>
</tbody>
</table>

If you were one of 10 people to have your verbal intelligence evaluated, which one would you be?

<table>
<thead>
<tr>
<th>Least verbally intelligent</th>
<th>Most verbally intelligent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  2  3  4  5  6  7  8  9</td>
<td>10</td>
</tr>
</tbody>
</table>

If you were one of 10 people to have your emotional intelligence evaluated, which one would you be? (emotional intelligence being the ability to effectively perceive, appraise, express, and regulate emotions)

<table>
<thead>
<tr>
<th>Least emotionally intelligent</th>
<th>Most emotionally intelligent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  2  3  4  5  6  7  8  9</td>
<td>10</td>
</tr>
</tbody>
</table>
If you were one of 10 people to have your social skills evaluated, which one would you be?

<table>
<thead>
<tr>
<th>Worst social skills</th>
<th>Best Social skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
</tbody>
</table>

If you were one of 10 people to have your general intelligence evaluated, which one would you be?

<table>
<thead>
<tr>
<th>Least intelligent</th>
<th>Most intelligent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
</tbody>
</table>
Appendix H

The Self-Attributes Questionnaire

This questionnaire has to do with your attitudes about some of your activities and abilities. For the first ten items below, you should rate yourself relative to other women your own age by using the following scale:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>lower</td>
<td>lower</td>
<td>lower</td>
<td>lower</td>
<td>upper</td>
<td>upper</td>
<td>upper</td>
<td>upper</td>
<td>upper</td>
</tr>
<tr>
<td>5%</td>
<td>10%</td>
<td>20%</td>
<td>30%</td>
<td>50%</td>
<td>50%</td>
<td>30%</td>
<td>20%</td>
<td>10%</td>
<td>5%</td>
</tr>
</tbody>
</table>

An example of the way the scale works is as follows: if one of the traits that follows were “height”, a woman who is just below average height would choose “e” for this question, whereas a woman who is taller than 80% (but not taller than 90%) of women her age would mark “H”, indicating that she is in the top 20% on this dimension.

1. intellectual ability ____
2. social skills/social competence ____
3. artistic and/or musical ability ____
4. athletic ability ____
5. physical attractiveness ____
6. leadership ability ____
7. common sense ____
8. emotional stability ____
9. sense of humor ____
10. discipline ____
Appendix I

Personal Relative Deprivation Scale-Revised

Please indicate how much you agree or disagree with each of the following statements by circling the most applicable rating. Use the scale below as a reference.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>+1</th>
<th>+2</th>
<th>+3</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

1. I feel deprived when I think about what I have compared to what other people like me have. -3  -2  -1  0  +1  +2  +3

2. I feel privileged compared to other people like me. -3  -2  -1  0  +1  +2  +3

3. I feel resentful when I see how prosperous other people like me seem to be. -3  -2  -1  0  +1  +2  +3

4. When I compare what I have with what others like me have, I realize that I am quite well off. -3  -2  -1  0  +1  +2  +3

5. I feel dissatisfied with what I have compared to what other people like me have. -3  -2  -1  0  +1  +2  +3

Callan, Shead, & Olson (2011) JSPS
Appendix J

Dispositional Envy Scale

1. I feel envy every day.
2. The bitter truth is that I generally feel inferior to others.
3. Feelings of envy constantly torment me.
4. It is so frustrating to see some people succeed so easily.
5. No matter what I do, envy always plagues me.
6. I am troubled by feelings of inadequacy.
7. It somehow doesn’t seem fair that some people seem to have all the talent.
8. Frankly, the success of my neighbors makes me resent them.

1 = strongly disagree, 2 = moderately disagree, 3 = neither agree nor disagree, 4 = moderately agree, and 5 = strongly agree


*Internal consistency*

Coefficient alphas for each sample range from .83 to .86

*test-retest*

$r = .80$
Appendix K

Benign and Malicious Envy Scale (BeMaS)

1 (strongly disagree) to 6 (strongly agree).

(1) When I envy others, I focus on how I can become equally successful in the future. (B)
(2) I wish that superior people lose their advantage. (M)
(3) If I notice that another person is better than me, I try to improve myself. (B)
(4) Envy ing others motivates me to accomplish my goals. (B)
(5) If other people have something that I want for myself, I wish to take it away from them. (M)
(6) I feel ill will toward people I envy. (M)
(7) I strive to reach other people’s superior achievements. (B)
(8) Envious feelings cause me to dislike the other person. (M)
(9) If someone has superior qualities, achievements, or possessions, I try to attain them for myself. (B)
(10) Seeing other people’s achievements makes me resent them. (M)

(B) – Benign
(M) – Malicious


Internal consistency
The benign and malicious envy facets have high internal consistency, $\alpha = .79-.85$ and $.83-.90$, respectively.
Appendix L

Domain-Specific Envy Scale

Envy - attraction
1. It eats me up inside when people come across to others better than I do.
2. It annoys me when others are more popular than I am.
3. It disturbs me when people get along with others better than I do.
4. It makes me feel uncomfortable when others are more attractive than I am.
5. It bothers me when others can have every romantic partner that they want.

Envy - competence
6. It disturbs me when others have a greater fund of knowledge than I have.
7. It disturbs me when others can express themselves verbally better than I can.
8. It bothers me when others are quicker on the uptake of an issue than I am.
9. It is hard to bear when other people are more intelligent than I am.
10. It bothers me when others are more creative than I am.

Envy - wealth
11. It is hard for me to bear when others can buy everything they want to buy.
12. It bothers me when others own things that I cannot have.
13. It troubles me when others have higher tech equipment than I have.
14. It bothers me when others live in a better neighborhood than I do.
15. It is hard for me to bear when others have more clothes in their wardrobe than I have.

1 (not at all) 7 (very much)


Internal consistency
Tested across 4 studies (Cronbach’s $\alpha = .91-.93$)

attraction
.80-.90

competence
.84-.89

wealth
.84-.88

Test-retest
 total($r = .77$, $p < .001$). Retest correlations were stable across domains (i.e., $r = .78$, $p < .001$ for attraction; $r = .72$, $p < .001$ for competence; and $r = .73$, $p < .001$ for wealth)
Appendix M

New General Self-Efficacy Scale

1 = Not at all true  2 = Hardly true  3 = Moderately true  4 = Exactly true

New General Self-Efficacy Scale
1. I will be able to achieve most of the goals that I have set for myself.
2. When facing difficult tasks, I am certain that I will accomplish them.
3. In general, I think that I can obtain outcomes that are important to me.
4. I believe I can succeed at most any endeavor to which I set my mind.
5. I will be able to successfully overcome many challenges.
6. I am confident that I can perform effectively on many different tasks.
7. Compared to other people, I can do most tasks very well.
8. Even when things are tough, I can perform quite well.

Appendix N

Physical Self-Efficacy Scale
1 (strongly agree) – 6 (strongly disagree)

1. I have excellent reflexes. (1) (R)
2. I am not agile and graceful. (1)
3. I am rarely embarrassed by my voice. (2) (R)
4. My physique is rather strong. (1) (R)
5. Sometimes I don't hold up well under stress. (2)
6. I can't run fast. (1)
7. I have physical defects that sometimes bother me. (2)
8. I don't feel in control when I take tests involving physical dexterity. (1)
9. I am never intimidated by the thought of a sexual encounter. (2) (R)
10. People think negative things about me because of my posture. (2)
11. I am not hesitant about disagreeing with people bigger than me. (2) (R)
12. I have poor muscle tone (1).
13. I take little pride in my ability in sports. (1)
14. Athletic people usually do not receive more attention than me. (2) (R)
15. I am sometimes envious of those better looking than myself. (2)
16. Sometimes my laugh embarrasses me. (2)
17. I am not concerned with the impression my physique makes on others. (2) (R)
18. Sometimes I feel uncomfortable shaking hands because my hands are clammy. (2)
19. My speed has helped me out of some tight spots. (1) (R)
20. I find that I am not accident-prone. (2) (R)
21. I have a strong grip. (1) (R)
22. Because of my agility, I have been able to do things which many others could not do. (1) (R)

(R) = Reverse coded
(1) = Factor 1: Perceived Physical Ability
(2) = Factor 2: Physical Self-Presentation Confidence
Appendix O

Scale of Perceived Social Self-Efficacy (PSSE)

rate 1 (no confidence)- 5 (complete confidence)

1. Start a conversation with someone you don’t know very well.
2. Express your opinion to a group of people discussing a subject that is of interest to you.
3. Work on a school, work, community or other project with people you don’t know very well.
4. Help to make someone you’ve recently met feel comfortable with your group of friends.
5. Share with a group of people an interesting experience you once had.
6. Put yourself in a new and different social situation.
7. Volunteer to help organize an event.
8. Ask a group of people who are planning to engage in a social activity (e.g., go to a movie) if you can join them.
9. Get invited to a party that is being given by a prominent or popular individual.
10. Volunteer to help lead a group or organization.
11. Keep your side of the conversation.
12. Be involved in group activities.
13. Find someone to spend a weekend afternoon with.
14. Express your feelings to another person.
15. Find someone to go to lunch with.
16. Ask someone out on a date.
17. Go to a party or social function where you probably won’t know anyone.
18. Ask someone for help when you need it.
19. Make friends with a member of your peer group.
20. Join a lunch or dinner table where people are already sitting and talking.
21. Make friends in a group where everyone else knows each other.
22. Ask someone out after s/he was busy the first time you asked.
23. Get a date to a dance that your friends are going to.
24. Call someone you’ve met and would like to know better.
25. Ask a potential friend out for coffee.
Appendix P

Consent

Project Title: Individual differences in mindfulness and social comparisons
Researcher(s): Dallas Novakowski, Master’s Thesis Student, Psychology, University of Regina, (306) 550-8646, novakoda@uregina.ca
Tyler Meadows, undergraduate Student, Psychology, University of Regina, (306) 737-6058, meadowst@uregina.ca
Supervisor: Sandeep Mishra, Faculty of Business Administration, (306) 737-3250 sandeep.mishra@uregina.ca

Purpose(s) and Objective(s) of the Research:
The purpose of this research project is to determine whether certain individual differences such as personality, intelligence, facial symmetry, strength, are associated with specific types of risk-taking behaviour such as asocial risks (extreme sports) and prosocial risks (heroic acts).

Procedures:
· You will be asked to fill in several self-report measures on your risk-taking behaviours as well as several questionnaires about yourself. Additionally, you will be asked to complete a brief test of verbal intelligence, a measurement of hand grip strength, an assessment of your weight and height, and to have your picture taken in order to calculate your facial symmetry.
· This study will take approximately 60 minutes
Please feel free to ask any questions regarding the procedures and goals of the study or your role.

Potential Risks:
There is a risk for psychological or emotional distress as you will be asked to report some potentially unpleasant information: feelings of anxiety, intolerance of uncertainty, past antisocial or criminal behaviours, and any diagnoses of mental illness. There may also be some risk of muscle discomfort when measuring handgrip strength.
· If you feel discomfort when faced with any questions or measurements, you may skip them with no penalty.
· Should you experience any significant distress, please contact the Saskatchewan crisis hotline: http://www.sk.211.ca/saskatchewan_247_hour_crisis_hotlines - 6th

Compensation:
· By participating in this study you are eligible for 2% bonus for an eligible class in either the Psychology or Business Participant Pool. Preference for the application of this credit should be declared before the study begins.

Confidentiality:
· Although the data from this research project will be published and presented at conferences, the data will be reported in aggregate form, so that it will not be possible to identify individuals.
If you have participated in the online version of this study before, titled “Individual differences and risk-taking behaviour,” you will be asked to provide your email address so that we may link the data from your two sessions. Otherwise, do not put your name or other identifying information on the materials used.

Although your picture will be taken and may be used for future studies outside of the city, it will only be distributed or otherwise viewed outside of our studies with your consent.

**Right to Withdraw:**
Your participation is voluntary and you can answer only those questions and participate in tasks that you are comfortable with. You may withdraw from the research project for any reason, at any time without explanation or penalty of any sort.

Whether you choose to participate or not will have no effect on your class standing or how you will be treated.

Should you wish to withdraw during the study, your course credit will still be applied and your data will be excluded from analyses and destroyed. Your right to withdraw data from the study will apply until results have been disseminated. After April 16th, 2016, it is possible that some form of research dissemination will have already occurred and it may not be possible to withdraw your data.

**Follow up:**
To obtain results from the study, please inform the researcher via the contact information listed at the top of this section.

**Questions or Concerns:**
Contact the researcher(s) using the information at the top of page 1; This project has been approved on ethical grounds by the UofR Research Ethics Board on (October 27, 2015). Any questions regarding your rights as a participant may be addressed to the committee at (585-4775 or research.ethics@uregina.ca). Out of town participants may call collect.

You will be asked to have your picture taken and saved for analysis, do you consent to having your face photographed? (Y/N)

If you have your picture taken, do you consent to photographs being viewed by participants in future studies?

Note: photographs will only be shown to participants in later projects if they live outside of Regina, minimizing the chances of you being recognized by your peers. (Y/N)
Appendix Q

DEBRIEFING

A Study of individual differences in social comparisons and mindfulness

The study you just participated in was designed to understand the relationships between (a) tendency to feel negative emotions when at a disadvantage, (b) Intrinsic factors such as strength, coordination, verbal intelligence, and facial symmetry, and (c) a variety of other individual differences.

The purpose of this research is to examine whether various individual differences are associated with greater negative reactions to unfavourable social comparisons. We are specifically interested in the association between embodied capital (strength, coordination, verbal intelligence, facial symmetry) and social comparisons and individuals’ tendency to experience envy and their ability to be mindful of their present experiences. We expect that since individuals high in these forms of embodied capital can effectively compete for resources, status, sexual partners, and so on, they will have less negative reactions when comparing themselves to others. Due to the stress of potentially being at a disadvantage, we also expect that people low in traits such as strength, intelligence, and attractiveness will have a more difficult time being mindful.

Additionally, you completed measures of personality, mindfulness, self-esteem, social acceptance, mate value, relative deprivation, self-efficacy, narcissism, self-perceived attractiveness, strength, and intelligence. We are interested in exploring how these individual differences are associated with different patterns of social comparisons and risk-taking behaviours.

Thank you for participating in this study! Your time and effort is very much appreciated. If you have any further comments or questions about this research project, please contact us:

**PRIMARY RESEARCHER:**
Dallas Novakowski, Undergraduate Student, Department of Psychology, University of Regina  novakoda@uregina.ca  (306) 550-8646

Tyler Meadows, undergraduate Student, Psychology, University of Regina  medowst@uregina.ca  (306) 737-6058

**Supervisor:** Sandeep Mishra, Ph.D., Faculty of Business Administration, University of Regina  sandeep.mishra@uregina.ca  (306) 585-4783

If you feel distress for any reason, you may reach the Saskatchewan Crisis Hotline at http://www.sk.211.ca/saskatchewan_247_hour_crisis_hotlines - 6th

Results will be posted at http://www.sandeepmishra.ca/?page_id=227; please make record this link and check back after <April 16, 2017> for full results.

The Research Ethics Board at the University of Regina has approved this project. If you have any questions or concerns about your rights or treatment as a research participant, you may contact the Chair of the Ethics Board at (306) 585-4775 (you may call collect if
you wish) or by email: research.ethics@uregina.ca. If you require any assistance related to your participation in this study, you can contact any member of the research team and thereafter be provided, or guided to a provider, of the assistance they require.
Appendix R

Procedure

1. Give participants briefing on procedure
   a. They will sit at a computer and complete a series of self-report instruments as well as a small verbal IQ test
   b. Afterwards, they will 1) have their picture taken, 2) perform a hand grip strength test, 3) do a test of coordination, and 4) have their body fat percentage measures on an upper body and a lower body scale

2. Before starting, note time and date next to participant number (on a shared excel spreadsheet, or if necessary, on a piece of paper)
   a. Participant number will be used to connect data from the computer task to the in-person task

3. Computer task
   a. When seating participant at their computer, enter their participant number where prompted (before consent form)
   b. Let participant know that they can skip any items or measures they do not wish to answer and that they can come to the researcher with questions at any time. Instruct participant to approach researcher when they are finished

In-lab section

4. Hand grip strength test
   a. Right hand tested first
   b. bicep parallel to torso
   c. Elbow at 90º
   d. Sit in chair with back support and fixed arms (same chair every time)
   e. Wrists in a neutral position just over the arm of the chair, thumb facing upward
   f. Observer rests base of the dynamometer in the palm of their hand while participant grips (not restricting movement, just negating gravity)
   g. Encourage participant to grip as hard and long as possible
   h. Once needle stops rising, participant can be instructed to stop squeezing
   i. Read measurement in kilograms from outside dial and record to nearest 1 kg
   j. Rest one minute then perform with left hand
   k. Three readings for each hand should be taken in total (three left, three right)

5. Photograph
   a. Ask participant if they have consented to having their picture taken
   b. Standardize distance, zoom, and lighting conditions
   c. Take four to six images
   d. Instructions
      i. Please tie your hair back and maintain a neutral expression
   e. Exclude
      i. Facial hair obscuring landmarks
ii. No image with neutral expression
iii. No image with planar orientation of the face

6. Peg task
   a. Centered in front of person
   b. Dominant hand tested first
   c. Instructions
      i. “Pick up the pegs one at a time, using your right (or left) hand only, and put them into the holes in any order until the holes are filled. Then, remove the pegs one at a time and return to the container. Stabilize the peg board with your left (or right) hand. This is a practice test. See how fast you can put all of the pegs in and take them out again. Are you ready? GO!!”
      ii. “This will be the actual test. The instructions are the same. Work as quickly as you can. Are you ready? GO! [During the test] “Faster!” [As soon as the last peg is in the board] “Out again...faster!”
   d. Repeat with left hand (5 times each?)

7. Height
   a. Ask participants to take off their shoes and stand in front of measuring tape, measure in centimetres

8. BMI
   a. Ask participant if they have a pacemaker or any other electronic medical device – these measures use electrical currents and could KILL participants

9. Lower body (do first to determine weight)
   a. Ask participants their age, input age and height (convert to feet)
   b. Record layers/ask participants to take off any excess garments
      i. Ask them to take off their socks and stand on the scale
      ii. Once reading is complete ask them to step off and record weight, body fat percentage, hydration, muscle, and bone density (take picture?)
   c. Instruct them to put footwear back on

10. Upper body
    a. Enter weight (in kilograms) and height (in centimeters)
    b. Instruct participant to stand and hold the scale with elbows locked at 90 degrees (OMRON instruction manual)
    c. Record body fat percentage in athlete and nonathlete modes
      i. Nicole E. Jensky-Squires, et alia, “Validity and reliability of body composition analysers in children and adults,” British Journal of Nutrition, vol 100 (2008), pp. 859–865. All quotes and citations from this article unless otherwise noted.
    d. Errors
       i. E1 – electrodes not firmly grasped
       ii. E3 - hands are dry (moisten with a wet towel)
       iii. E4 - % is outside of measurable range
       iv. E5 + E6 – Irregular operation (turn off and on again)
e. If “ERR” more than twice, record missing information

11. Thank participant for their time, give them a debriefing form
Appendix Q

Ethics Materials

Application for Behavioural Research Ethics Review

Evaluating Applications
The matters of greatest concern to the Behavioural Research Ethics Board (Beh-REB) are the issues of informed consent of participants, voluntary participation, protection of individual privacy (confidentiality and anonymity), and safeguarding participants from any harmful results due to participation or non-participation in the proposed investigation or research project. Our evaluation of an application is based on the degree to which each of these concerns are satisfied; when filling out the application, researchers are urged to consider these points, and to explain to the Beh-REB the steps they will take to address the concerns. Researchers are also urged to consult the Tri-Council Policy Statement 2 for more information and guidance.

The Beh-REB acknowledges the variety of paradigms and methodologies currently available to researchers, and that each of these paradigms entails its own particular ethical issues. Thus, there may be more than one way to address an ethical issue. Researchers should feel free to suggest alternative approaches or to explain why a particular requirement is not appropriate in the context of a given project.

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<table>
<thead>
<tr>
<th>PART 1: IDENTIFICATION</th>
</tr>
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<tbody>
<tr>
<td><strong>1.1</strong></td>
</tr>
<tr>
<td>Project Title: <strong>GN.1.1</strong></td>
</tr>
<tr>
<td>Domain specificity of risk-taking as a function of embodied capital</td>
</tr>
<tr>
<td><strong>1.2</strong></td>
</tr>
<tr>
<td>Principal Investigator: <strong>GN.1.2</strong></td>
</tr>
<tr>
<td>Full Name: Dallas Novakowski</td>
</tr>
<tr>
<td>Mailing Address: 215 Hotogte Crescent, Regina, SK, S4X.2T2</td>
</tr>
<tr>
<td>Email: <a href="mailto:dallasnovakowski@gmail.com">dallasnovakowski@gmail.com</a></td>
</tr>
<tr>
<td>Phone: (306) 500-3040</td>
</tr>
<tr>
<td>NSID number (U of S faculty only):</td>
</tr>
<tr>
<td><strong>1.3</strong></td>
</tr>
<tr>
<td>University/Institutional Affiliation of Principal Investigator: <strong>GN.1.3</strong></td>
</tr>
<tr>
<td>Position: Honours thesis student</td>
</tr>
<tr>
<td>Department: Faculty of Arts - Psychology</td>
</tr>
<tr>
<td>Division: N/A</td>
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<tr>
<td><strong>1.4</strong></td>
</tr>
<tr>
<td>If this is a student/graduate/resident project, please provide the following information: <strong>GN.1.4</strong></td>
</tr>
<tr>
<td>a) Student Name(s) and Student ID or NSID (s): Dallas Novakowski - 2002913522</td>
</tr>
<tr>
<td>b) Supervisor Name: Sandeep Misra</td>
</tr>
<tr>
<td><strong>1.5</strong></td>
</tr>
<tr>
<td>Project Personnel (include graduates/post graduates/residents): <strong>GN.1.5</strong></td>
</tr>
<tr>
<td>Full Name: Sandeep Misra</td>
</tr>
<tr>
<td>Project Position/Role: Full Name: Dallas Novakowski</td>
</tr>
<tr>
<td>University/Institutional Affiliation: University of Regina</td>
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<tr>
<td>University/Institutional Affiliation: University of Regina</td>
</tr>
<tr>
<td>Email: <a href="mailto:misra@gmail.com">misra@gmail.com</a></td>
</tr>
<tr>
<td>Phone: (306) 737-3200</td>
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<tr>
<td><strong>1.6</strong></td>
</tr>
<tr>
<td>Primary Contact Person for Correspondence (if different than Section 1.2) <strong>GN.1.6</strong></td>
</tr>
<tr>
<td>Full Name:</td>
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<td>Mailing address:</td>
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<td>Email:</td>
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<td>Phone:</td>
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PART 2: CONFLICT OF INTEREST

2.1.1 Is there any real, potential or perceived conflict of interest (any personal or financial interest in the conduct or outcome of this project?  **Yes**  **No**

2.1.2 Will any of the researcher(s), members of the research team and/or their immediate family members:

- Receive personal benefits in connection with this project or above the direct costs of conducting the project, such as remuneration or employment?
- Receive significant payments from the sponsor such as grants, compensation in the form of equipment or supplies or remuneration for ongoing consultation and honoraria?
- Have a non-financial relationship with a sponsor (such as unpaid consultant, board membership, advisor or other non-financial interest)?
- Have any direct involvement with the sponsor such as stock ownership, stock options or board membership?
- Hold patents, trademarks, copyrights, licensing agreements or intellectual property rights linked in any way to this project or the sponsor?
- Have any other relationship, financial or non-financial, that if not disclosed, could be construed as a conflict of interest?

**Yes**  **No**

PART 3: BRIEF OVERVIEW OF RESEARCH PROJECT

Briefly describe the project, its objectives and potential significance (250-500 words):  **续**

The proposed study will examine whether participation in antiscial (delinquency), prosocial (heroic acts) or asocial (physically risky behavior) risk-taking differs among individuals as a function of individual differences in trait personality that can be measures via physiological (facial symmetry, heart rate) and performance (verbal intelligence test, coordination measures).

Risk-taking behavior has been associated with a "risk personality" consisting of low self-control, high impulsivity, and high sensation seeking. However, the role of embedded capital has received less attention. Additionally, it is possible that if embedded capital is indeed associated with risk-taking behavior, its influence may be limited to specific types of risk-taking.

Low levels of embedded capital can confer competitive disadvantage to organisms as they attempt to gain status, resources, and sexual partners. As predicted by risk-sensitivity theory, competitive disadvantage has been shown to cause individuals to become more risk-accepting. This is due to an individual not being able to achieve their goals by safe and stable means and resorts to risk-taking behavior at least have a chance of meeting those goals. We predict that the persistent competitive disadvantage caused by low embedded capital will lead individuals to engage in antisocial risk-taking.

3.1 By contrast, we expect individuals high in embedded capital to engage in prosocial and asocial risk-taking. Instead of engaging in risky behavior due to an inability to meet goals through traditional means, we expect these individuals to take risks because their abilities and intrinsic traits allow them to carry out these activities more successfully. For those with high embedded capital, risk-taking behavior is a way to internally signal their desirable qualities to potential mates and peers, the difficulty of the task involved exposes individuals who do not have the relevant embedded capital.
Whereas past research on individual differences in risk-taking have focused on personality constructs, the current study will examine a neglected source of individual variation. This project is of substantial theoretical importance to risk-taking behavior as it will increase our knowledge of the functional role of risk-taking, although it can impose serious costs, risk-taking across domains may serve a functional role to enhance an organism’s fitness.

This project will also seek to address several secondary questions:
- associating embodied capital with perceived self-efficacy
- associating embodied capital with gambling behaviour
- associating embodied capital as well as risky personality with trust propensity
- associating embodied capital/different types of risk-taking behaviours with life history theory
- associating risk-taking behaviour/life history strategy/future discounting/risky personality traits to instabilities in early family environment

Provide a description of research design and methods to be used:  

The project will be undertaken in two separate studies:

Study 1 - Participants will be recruited on Qualtrics, a crowdsourcing Internet marketplace that enables researchers access to human participants of varying attitudes, characteristics, and ethnic backgrounds. Participants will provide basic demographic information, and will fill out an online questionnaire. The questionnaire will take approximately 30 to 80 minutes to complete, and can be filled out at the participants’ leisure. at any time. This sample will serve to answer secondary research questions and to pilot measurements.

Study 2 - After recruitment and collection through Qualtrics, a second separate sample will be recruited from students from the University of Regina’s Psychology Participant Pool as well as those enrolled in the Paul J. Hill School of Business. In this sample, participants will be administered the same series of self-report questionnaires as the participants through Qualtrics.

Additionally, they will have measurements taken of physical embodied capital (hand grip strength, hand dexterity, facial symmetry) as well as verbal intelligence and vocal pitch. Participants will have their voice pitch measured by reading 3.2

Before beginning the study in both samples, the participant will be given a thorough written introduction to the study, and will be assured of complete confidentiality and the right to withdraw at any time.

The questionnaire will consist of a series of questions that will be answered via either selection buttons on a rating scale, or typed-in answers. See attached for questionnaires questionnaire (Appendix A). Measurements:

hand dynamometer readings, 9 hole peg task, horizontal facial symmetry, Verbal intelligence score, self-report measures of social, prosocial, and antisocial risk-taking participation, general trust scale, general gambling involvement scale, problem gambling severity index, participation in different types of gambling (cards vs. sports vs. slot machines), scales of general, physical, and social self-efficacy, scales of subjective social status and prestige, self-rated performance on measures of embodied capital, self-esteem score, Domain-Specific Risk-taking scale, future discounting scale, Arizona life history battery, mate value scale, Retrospective family unpredictability scale, narcissistic personality inventory, Zuckerman’s Sensation-Seeking Scale, Eysenck’s Impulsivity Scale, Retrospective behavioral self-control Scale, demographic information (age, socioeconomic status, parent vs. nonparent), Grill

Provide details regarding the duration and location of data collection event(s):  

Online participants in Study 1 will complete the study at the location of their choosing and at their own pace. Participants in Study 2 will participate at the University of Regina and the duration of data collection will not exceed 90 minutes.

- Questionnaire
- Individual Interviews
- Group Interview
- Video/audio recording
- Home Visits
- Other:

PART 4: PROJECT DETAILS

REB Application for Behavioural Research Ethics Review (last update 16-May-2012)
4.1.1 Will you have any internet-based interaction with participants?  **ON 4.1**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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4.1.2 If you are using a third party research tool, website survey software, transaction log tools, screen capturing software, or masked survey sites, how will you ensure the security of data gathered at that site?

Crowdflower is an online crowdsourcing platform for behavioral tasks, and will be used for the recruitment of subjects. Crowdflower users are only identified using random 14-digit codes (e.g., A12EIZ23G0Q1/FQ). No other identifying information for participants is available to the researchers (including IP address, name, account username, etc.).

Participants will use the Crowdflower platform to access our study, which will be hosted on Qualtrics. Qualtrics is an internet-based data collection platform for presenting questionnaires and surveys. Qualtrics (and the data collected on this platform) is only accessible using secure usernames and passwords. Participants engaged in the study will have to download a "session cookie" which records encrypted authentication information for a data collection session. Session cookies include no identifying information from the user (e.g., username/password). For data security, Qualtrics states the following: "Qualtrics uses Transport Layer Security (TLS) encryption (also known as HTTPS) for all transmitted data. We also protect surveys with passwords and HTTP referrer checking. Our data is hosted by third party data centers that are SSAE-18 SOC II certified. All data at rest are encrypted, and data on decrypted hard drives are destroyed by U.S. DoD methods and delivered to a third-party data destruction service." As a consequence, all data collected are safe, secure, and only accessible to the researchers.

More information on data security can be found here:

http://www.qualtrics.com/security-statement

4.1.3 Describe how permission to use any third party owned site(s) will be obtained, if applicable:

Qualtrics will be accessed through paid accounts

4.1.4 How will you protect the privacy and confidentiality of participants who may be identified by email addresses, IP addresses, and other identifying information that may be captured by the system during your interactions with these participants?

No identifying information will be collected for participants in Study 1.

4.1.5 If you do not plan to identify yourself or your position as a researcher to the participants, from the onset of the research study, explain why you are not doing so, at what point you will disclose that you are a researcher, provide details of debriefing procedures, if any, and if participants will be given a way to opt out, if applicable:

NA

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4.2 Will your research involve Aboriginal Peoples including First Nations, Inuit and Métis peoples?  **ON 4.2**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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4.3 Will the project involve community-based participatory research?  **ON 4.3**

<table>
<thead>
<tr>
<th>Yes</th>
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4.4 Will deception of any kind be necessary in this project?  **ON 4.4**

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<thead>
<tr>
<th>Yes</th>
<th>No</th>
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4.5 Indicate how the participants will be debriefed following their participation (if applicable), and describe how the information on the results of the research will be made available to participants once the study has ended. Debriefing is particularly important if deception has been used.  **ON 4.5**

No deception will be used. After completing the measures described above, participants will receive a thorough written debriefing, including the full purpose of the study and all hypotheses and predictions. Participants will also be provided with a link where the complete results of the study will be posted. Participants will be invited to bookmark this link if they are interested in the results.

4.6 Will participants be compensated?  **ON 4.6**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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</table>

Please include details:

Online users in Study 1 will be compensated monetarily (with an expected monetary incentive of approximately $1.50). In-lab participants will be given a course credit.
4.7.1 Will participants be anonymous in the data gathering phase of the study? (Anonymous means that no link can be established between the participant and the research - no one including the researcher knows who has participated in the research):

☐ Yes  ☒ No

4.7.2 Will the confidentiality of participants and their data be protected? (Confidentiality means that no link can be established between the collected information and the participant’s identity)

☒ Yes  ☐ No

4.7.3 If yes, are there any limits to confidentiality:

☐ Limits due to the nature of group activities (e.g. focus groups): the researcher cannot guarantee confidentiality

☐ Limits due to context: individual participants could be identified because of the nature or size of the sample or because of their relationship with the researcher.

☒ Limits due to selection: procedures for recruiting or selecting participants may compromise the confidentiality of participants (e.g. participants are referred to the study by a person outside the research team)

☐ Other

On-line participants in Study 1 will be fully anonymous. Pictures and vocal recordings of in-lab participants in Study 2 will be associated with their data on other measures, but links between data and their pictures and voice recordings will only be known by the researchers. Additionally, photographs and voice recordings may be used in future studies, but will not be distributed or viewed outside of laboratory contexts.

PART 5: ESTIMATION OF RISKS AND BENEFITS

5.1.1 Do you consider this project to be: ☒ GN 5.1

☐ Minimal Risk  ☐ Above Minimal Risk

5.1.2 Indicate if the participants might experience any of the following:

Risk of psychological or emotional harm or discomfort (e.g. trauma, anxiety, stress)

There is little to no risk of psychological or emotional harm or discomfort from completing the survey. Some participants may feel uncomfortable completing an inventory about their levels of desirable traits (intelligence, attractiveness) and reporting their exposure to death, but this discomfort should be in large part mitigated by the fact that the survey is confidential. The risk from this study is also mitigated by the voluntary nature of the study.

Legal repercussions for participating in the study (e.g. possibility of being sued, charged with criminal activity, disclosure of past or future criminal activities, etc.)

There is no risk of legal repercussions from participation in this study.

Social repercussions (e.g. ostracized, being negatively judged by peers or employer, fired from your job)

There are no social repercussions from participation in this study.

Risk of physical harm or discomfort (e.g. falling, muscle pain, tiredness, weakness, nausea)

There is no risk of muscle discomfort from measurement of hand grip strength in Study 2.

5.1.3 Describe how the risk will be managed (including an explanation as to why an alternative approach could not be used). If appropriate, identify any resources, e.g. physician or counselor, to which participants can be referred:

ON 5.1.3

Any anxiety or discomfort for completing measures will be managed by emphasizing to participants in the introduction to the study that all data collected is completely confidential. If participants do not want to complete the measure, they will be able to skip the item their completion.

5.1.4 If above minimal risk, what are the likely benefits of the research to the researcher, participant, the research community and society that would justify asking participants to participate? ON 5.1.4

N/A

PART 6: PARTICIPANT RECRUITMENT

6.1 Describe the participants and the criteria for their inclusion or exclusion. Indicate the number of participants and a brief rationale for the intended number of participants: GN 6.1

No criteria is used to exclude participants. Although a formal power calculation has yet to be performed, the number of participants used will be chosen to obtain sufficient statistical power. Approximately 300 participants will be gathered for Study 1, while approximately 50 will be used for Study 2.

REB Application for Behavioural Research Ethics Review (last update 16 May 2012)
### 6.2 Method of recruitment

**6.2.1 Provide a detailed description of the method of recruitment.**
In Study 1 the study will be posted as a behavioral task that can be completed on the Qualtrics platform. Users can then self-select to participate if they choose to. The study can be completed on-demand by following a hyperlink. Study 2 will be advertised in eligible courses and in the Psychology Participant Pool and the Business Participant Pool.

**6.2.2 How will prospective participants be identified?**
Participants will not be identified in Study 1; anyone on the Qualtrics platform can participate in our study. For Study 2, participants will be assigned a number.

**6.2.3 Who will contact prospective participants?** Describe the source of the contact information, how they will be contacted and as applicable, who originally collected the contact information. Ensure any letters of initial contact or other recruitment materials are attached, e.g., advertisements, flyers, telephone script, etc. Participants will self-identify and volunteer to participate. The listing on Crowdflower will be as follows: “Earn $1.50 to answer a few questions about yourself and your risk-taking behaviors.” Any other advertisements will be described as follows: “Earn course credit to answer a few questions about yourself and your risk-taking behaviors.”

### 6.3 Ethical considerations

**6.3 In cases where the research involves special or vulnerable populations, distinct cultural groups, or in cases where the research is above minimal risk, the researcher should describe their experience or training in working with the population.** If none of these criteria apply, this section may be omitted. **GIN 6.3**

**6.4 Where relevant, please explain any relationship (pre-existing, current or expected to have) between the researcher(s) and the researched (e.g., instructor-student, manager-employee, co-workers, family members/intimate relationships, etc.).** Please pay special attention to relationships in which there may be a power differential. Describe any safeguards and procedures to prevent possible undue influence, coercion or inducement. **GIN 6.4**

No relationship is possible through Qualtrics in Study 1. For Study 2, Researcher-student and student-student relationships may occur, but undue influence will be controlled by emphasizing participants’ voluntary participation and right to withdraw at any time.

## PART 7: CONSENT PROCESS

Describe the process that will be used to obtain informed consent. Please note that it is the content of the consent, not the format that is important. If the research involves collection of personally identifiable information from a research participant or extraction of personally identifiable information from an existing database, please describe how consent from the individuals or authorization from the data custodian will be obtained. If there will be no written consent, please provide a rationale for oral or implied consent (e.g., cultural appropriateness, online questionnaire, etc.) and explain how consent will be recorded.

**7.1 Describe the consent process.**
Participants will be given a thorough written introduction to the study before participating. Participants will be informed that the researchers seek to gain a better understanding of the relationship of different individual differences in risk-taking and that the study will involve completing several questionnaires and behavioral tasks, and that the study will take approximately 30 minutes to complete. It will be made clear to participants that they may withdraw from the study at any time without penalty. Participants in Study 2 will also be informed of physical measurements including facial photographs and voice recordings and that the study may take 45-60 minutes.

The written introduction will also include brief summaries of (a) the rationale for the project, (b) the role of participants, (c) potential benefits of the research, (d) mechanisms in place to ensure anonymity/confidentiality, (e) the right to withdraw from the study at any time, and (f) contact information for the researchers if there are any questions, concerns, or assistance required. Details of ethics approval and contact information of the University of Regina Research Ethics Board will be provided. Participants will then be asked to provide their consent to proceed by checking an “I agree” box.

**7.1.2 Who will ask for consent?**
In Study 1, participants will be asked for consent on-line via written instructions/introduction through Qualtrics. For Study 2, the researcher present will ask for consent via written instructions.

**7.1.3 Where, and under what circumstances will consent be obtained?**
Consent will be obtained after a detailed introduction to the study, and before completion of surveys or behavioral tasks. Participants will be provided with the researchers’ contact information should they have any questions or concerns regarding the study before they sign the consent form.

**7.1.4 Describe any situation in which the renewal of consent for this research might be appropriate and how this would take place (e.g., longitudinal studies, multiple data collection events, etc.).**

N/A
7.2 If any or all of the participants are children and/or are not competent to consent, describe the process by which capacity/competency will be assessed, the proposed alternate source of consent - including any permission/ information letter to be provided to the person(s) providing the alternate consent - as well as the consent process for participants. **GN 7.2**

All participants will be 18 and older in Study 1. And in Study 2 all participants will be undergraduates.

7.3 Describe your plans for providing project results to the participant? **GN 7.3**

After completion of the study, we will provide participants with a link where the study results (once completed) will be posted in full.

7.4 How and when are participants informed of the right to withdraw? What procedures will be followed for participants who wish to withdraw at any point during the study? **GN 7.4**

Participants will be informed during the written introduction and consent process of the right to withdraw at any point in time during the study. Participants can withdraw from the study by simply closing their web browser for Study 1 or stating their wish to withdraw any time during Study 2.

---

**PART 8: DATA SECURITY AND STORAGE**

Indicate the procedures you plan to implement to safeguard and store the data. Identify the person who will be assuming responsibility for data storage (University regulations require the researcher or the supervisor, in the case of student research, to securely store the data at the University of Saskatchewan for a minimum of five years upon the completion of the study - *(Procedures for Stewardship of Research Records at the University of Saskatchewan 2010)*

8.1 Who will conduct the data collection? **GN 8.1**

Dallas Novakowski will be responsible for managing data collection. Dr. Mishra will oversee the data collection and assist where necessary. Dr. Mishra will assume responsibility for data storage after collection is complete.

8.2 Who will have access to the original data of the study? **GN 8.2**

Dr. Mishra and Dr. Novakowski will have access to the original data. Both have experience with and are aware of their responsibilities concerning the safeguarding of participant data.

8.3 How will confidentiality of original data be maintained as well as preserving or destroying data after the research is completed? For all data (e.g. paper records, audio or visual recordings, electronic recordings), indicate this: **GN 8.3**

8.3.1 Person responsible for data storage:

Dr. Mishra will be responsible for the appropriate storage of electronic data.

8.3.2 Data security during transportation from collection site:

Data will be housed in encrypted data centers for Study 2, for Study 1 and downloaded and deleted from computers in Study 2. Downloaded data will be securely stored on an encrypted hard drive on the investigator's computer.

8.3.3 Means and location of storage (e.g. locked filing cabinet, password protected computer files, encryption):

See 8.3.2

8.3.4 Time duration of storage (Must be > 5 Years):

Data will be stored for a period of no less than seven (7) years from date of completion.

8.3.5 Final disposition (archive, shredding, electronic file deletion):

Final disposition of data will consist of electronic file deletion.

8.4 Indicate how the data collected is intended to be used (thesis, journal articles, conference presentation, media, etc). **GN 8.4**

The data collected will serve as an honors thesis and be analyzed in aggregate and will be submitted for publication in an academic journal, and will be presented at conferences.
PART 9: Declaration by Principal Investigator
(or Supervisor for student projects)

Project Title
Domain specificity of risk-taking as a function of embodied capital

I confirm that the information provided in this application is complete and correct.
I accept responsibility for the ethical conduct of this project and for the protection of the rights and welfare of the human participants who are directly or indirectly involved in this project.
I will comply with all policies and guidelines of the University and Health Region/affiliated institutions where this project will be conducted, as well as with all applicable federal and provincial laws regarding the protection of human participants in research.
I will ensure that project personnel are qualified, appropriately trained and will adhere to the provisions of the REB-approved application.
I certify that any significant changes to the project, including the proposed methods, consent process or recruitment procedures, will be reported to the Research Ethics Board for consideration in advance of its implementation.
I certify that a status report will be submitted to the Research Ethics Board for consideration within one month of the current expiry date each year the project remains open, and upon project completion.
If personal health information is requested, I assure that it is the minimum necessary to meet the research objective and will not be reused or disclosed to any parties other than those described in the REB-approved application, except as required by law.
I confirm that adequate resources to protect participants (i.e., personnel, funding, time, equipment and space) are in place.
I understand that if the contract or grant related to this research project is being reviewed by the University or Health Region, a copy of the ethics application inclusive of the consent document(s), may be forwarded to the person responsible for the review of the contract or grant.
I understand that if the project involves Health Region resources or facilities, a copy of the ethics application may be forwarded to the Health Region research coordinator to facilitate operational approval.

[Signatures and dates]

Department Head (UofS and RQHR only): The signature/approval of the Department/Administrative Unit acknowledges that he/she is aware of and supports the research activity described in the proposal.

[Signatures and dates]
### Behavioural Research Renewal

#### IDENTIFICATION

1.1 File number: 2014102  
   Expiry date: October 28, 2016  
   Project Title

1.2 **Principal Investigator**  
   Full Name: Dallas Novakowski  
   Mailing Address: 215 Hodgins Crescent  
   Email: dallasnovakowski@gmail.com  
   Phone: 30694965467

   **Supervisor if a Student Project**  
   Full Name: Sandeep Mishra

1.3 Funder:

#### PART 2: CURRENT STATUS OF THE STUDY

2.1 **Does this project require annual reporting to another Saskatchewan REB?**  
   - [ ] Yes  
   - [X] No  
   If yes, specify where:

2.2 **Check all that apply:**  
   - [ ] Recruitment has not yet started  
   - [ ] Participants are currently being recruited  
   - [ ] Recruitment is closed  
   - [X] Data collection involving participants is on-going.  

   **What was the original number of participants to be recruited?** 250

   **How many research participants are currently in the study?** 99

   □ The data collection is complete, remaining research activities are limited to data analysis only.

   **How many research participants have completed the study?**

   □ The study is closed (Please complete the Behavioural Study Closure Form) Please note that various funding organizations require the study to remain open until the fund is closed.

2.3 **Since receiving original ethics approval, have any ethical concerns arisen?**  
   - [ ] Yes  
   - [X] No  
   If Yes, please provide the details on how the situation was resolved and what procedures and safeguards are in place to ensure participant safety:

2.4 **Provide a brief summary of study progress and results (100-200 words).**  
   As expected, participants have been collected from the psychology and participant pools. The results of the study have not been analyzed as the full sample has not yet
Research Ethics Board
Certificate of Approval

PRINCIPAL INVESTIGATOR
Dallas Novakowski
215 Hodges Crescent
Regina, SK S4X 2T2

DEPARTMENT
Psychology

REB# 2014-182

SUPERVISOR
Dr. Sandeep Mishra – Psychology

FUNDERS
Unfunded

TITLE
Prosocial, social, and antisocial risk-taking as a function of embodied capital

APPROVAL OF
Application for Behavioural Research Ethics Review
Appendix A Tests
On line Participant Consent Form
In lab Participant Consent Form
Debriefing – in lab
Debriefing – on line

Questions Alarms – SSS, SBS, The Mate Value Scale,
Problem Gambling Severity Index, RGS, Description of
Family of Origin, SSS, Short Grit Scale,
NPI-16 Report

APPROVED ON
October 28, 2014

RENEWAL DATE
October 28, 2015

CERTIFICATION
The University of Regina Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol, consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in advance of its implementation.

ONGOING REVIEW REQUIREMENTS
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion.
Please refer to the following website for further instructions: http://www.uregina.ca/research/REB/main.htm

Dr. Lance Hoeben, Chair
University of Regina
Research Ethics Board

Please send all correspondence to:
Office for Research, Innovation and Partnership
University of Regina
Research and Innovation Centre 109
Regina, SK S4S 0A2
Telephone: (306) 585-4775  Fax: (306) 585-4693  research.ethics@uregina.ca
Research Ethics Board  
Certificate of Renewal & Amendment

PRINCIPAL INVESTIGATOR  
Dallas Novakowski  
215 Hodgins Crescent, Regina, SK S4X 2T2

DEPARTMENT  
Psychology

REB#  
2014-182

SUPERVISOR  
Dr. Sandeep Mishra – Psychology

TITLE  
Prosocial, asocial, and antisocial risk-taking as a function of embodied capital

AMENDMENT APPROVAL OF  
Participant consent form  
Removal of the following measurements:
Gambling type scale  
Short Grit Scale.  
Satisfaction with social status (prestige & dominance).  
Caratter consistency.  
Domain-specific risk-taking Scale.  
Trust propensity scale.  
Self-reported delinquency scale.  
Future discounting scale.  
Arizona life history battery.  
Retrospective family unpredictability scale.  
General gambling involvement scale.  
Problem gambling severity index.  
Mortality exposure
Addition of the following 2 measures:  
Political orientation scale.  
Self-reported health

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<td>Gambling type scale</td>
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Full Board Meeting  
Delegated Review  

AMENDMENT CERTIFICATION  
The University of Regina Research Ethics Board has reviewed the changes to the above-named research project as outlined in your memo dated Sept 14, 2015 and they are approved.

ONGOING REVIEW REQUIREMENTS  
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion.

Please refer to the following website for further instructions:  
http://www.uregina.ca/research/REB/main.shtml

Ara Sterninger  
Research Ethics Board

Please send all correspondence to:  
Research Office  
University of Regina  
Research and Innovation Centre 100  
Regina, SK S4S 0A2  
Telephone: 0061-585-4775  
research.ethics@uregina.ca
Research Ethics Board
Certificate of Renewal & Amendment

PRINCIPAL INVESTIGATOR
Dallas Novakowski
215 Hodgins Crescent, Regina, SK S4X 2T2

DEPARTMENT
Psychology

REB#
2014-182

SUPERVISOR
Dr. Sandeep Mishra – Psychology

TITLE
Prosocial, asocial, and antisocial risk-taking as a function of embodied capital

AMENDMENT APPROVAL OF
Participant consent form

ORIGINAL DATE of APPROVAL
Oct 28, 2014

NEXT RENEWAL DATE
Oct 28, 2016

Date of Amendment Approval
October 27, 2015

Addition of the following measures:
Grit Scales (8 items)
Benign and Malevolent Envy Scale (10 items)
Intolerance of Uncertainty Scale (11 items)
Self-Report Delinquency Scale (25 items)
Generalized Anxiety Disorder Scale (7 items)
Mental Illness Diagnosis (1 items)

Full Board Meeting ☐
Delegated Review ☒

AMENDMENT CERTIFICATION
The University of Regina Research Ethics Board has reviewed the changes to the above-named research project as outlined in your memo dated October 27, 2015, and they are approved.

ONGOING REVIEW REQUIREMENTS
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions:
http://www.uregina.ca/research/faculty/committees/human/research/ethics-forms.html

Dr. Larena Hoebel, Chair
University of Regina
Research Ethics Board

Please send all correspondence to:
Research Office
University of Regina
Research and Innovation Centre 109
Regina, SK S4S 0A2
Telephone: (306) 585-4775
research.ethics@uregina.ca
Research Ethics Board
Certificate of Amendment Approval

PRINCIPAL INVESTIGATOR
Dallas Novakowski

DEPARTMENT
Psychology

REB#
2014-182

SUPERVISOR
Dr. Sundeep Mishra – Psychology

TITLE
Prosocial, asocial, and antisocial risk-taking as a function of embodied capital

AMENDMENT APPROVAL OF
Addition of the 6-item Deservingness of Bad Outcomes Scale

ORIGIANL DATE OF
APPROVAL
Oct 28, 2014

NEXT RENEWAL DATE
Oct 28, 2016

Date of Amendment Approval
May 17, 2016

Full Board Meeting  
Delegated Review  

AMENDMENT CERTIFICATION
The University of Regina Research Ethics Board has reviewed the changes to the above-named research project as outlined in your memo dated May 16, 2016, and they are approved.

ONGOING REVIEW REQUIREMENTS
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions:
http://www.uregina.ca/research/REB/main.shtml

Ara Steiner
Research Ethics Board

Please send all correspondence to:
Research Office
University of Regina
Research and Innovation Centre 109
Regina, SK S4S 0A2
Telephone: (306) 585-4775
research.ethics@uregina.ca
Principal Investigator: Dallas Novakowski
Department: Psychology
REB#: 2014-182

Title: Prosocial, antisocial, and antisocial risk-taking as a function of embodied capital

Amendment Approval of Additional measurements: Perceived individual social mobility; Prosocial, anti-social and antisocial risk-taking as a function of embodied capital; childhood and current/future socioeconomic status; Trait importance.

Original Date of Approval: Oct 28, 2014
Next Renewal Date: Oct 28, 2016
Date of Amendment Approval: June 8, 2016

Full Board Meeting: ☐
Delegated Review: ☑

Amendment Certification: The University of Regina Research Ethics Board has reviewed the changes to the above-named research project as outlined in your email dated May 30, 2016, and they are approved.

Ongoing Review Requirements: In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year. The study remains open, and upon study completion, please refer to the following website for further instructions: http://www.uregina.ca/research/REB/moin.shtml

[Signature]
Ara Steininger
Research Ethics Board

Please send all correspondence to: Research Office
University of Regina
Research and Innovation Centre 109
Regina, SK S4S 0A2
Telephone: (306) 585-2775
research.ethics@uregina.ca
### Tables and Figures

**Table 1.** Item-level intercorrelations within the Self-Perceived Embodied Capital Scale, bootstrapped and controlling for age and gender (n = 141).

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<th>SPECgrip</th>
<th>SPECpA</th>
<th>SPECcrd</th>
<th>SPECvIQ</th>
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**Notes:** Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. SPEC=Self-Perceived Embodied Capital Scale. SPECgrip=grip strength, SPECpA=physical attractiveness, SPECcrd=coordination, SPECvIQ=verbal intelligence, SPECgIQ=general intelligence, SPECoA=overall attractiveness, SPECeIQ=emotional intelligence, SPECstrong=overall strength, SPECsoc=social skills.
Table 2. Item-level bootstrapped partial correlations within the Self-Attributes Questionnaire, controlling for age and gender ($n = 141$).

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<td></td>
</tr>
<tr>
<td>SAQes</td>
<td>0.31***</td>
<td>0.2*</td>
<td>0.11</td>
<td>0.12</td>
<td>0.27**</td>
<td>0.35***</td>
<td>0.33***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAQhum</td>
<td>0.19*</td>
<td>0.4***</td>
<td>0.17*</td>
<td>0.36***</td>
<td>0.32***</td>
<td>0.14</td>
<td>0.31***</td>
<td>0.18*</td>
<td></td>
</tr>
<tr>
<td>SAQdisc</td>
<td>0.44***</td>
<td>0.22**</td>
<td>0.12</td>
<td>0.16</td>
<td>0.31***</td>
<td>0.29**</td>
<td>0.37***</td>
<td>0.41***</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Notes: Significance tests were two-tailed. * $p < .05$; ** $p < .01$; *** $p < .001$. SAQ = Self-Attributes Questionnaire
SAQint=intellectual/academic ability, SAQsoc=social skills, SAQart=artistic and/or musical ability, SAQath=competency or skill at sports, SAQatt=physical attractiveness, SAQlead=leadership ability, SAQcs=common sense, SAQes=emotional stability, SAQhum=humour, SAQdisc=discipline.
Table 3. Intercorrelations between items from the Self-Perceived Embodied Capital Scale and the Self-Attributes Questionnaire, bootstrapped and controlling for age and gender (n = 141).

<table>
<thead>
<tr>
<th></th>
<th>SPECgrip</th>
<th>SPECpA</th>
<th>SPECcrd</th>
<th>SPECvIQ</th>
<th>SPECgIQ</th>
<th>SPECoA</th>
<th>SPECeIQ</th>
<th>SPECstrong</th>
<th>SPECsoc</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAQint</td>
<td>0.12</td>
<td>0.20*</td>
<td>0.20*</td>
<td><strong>0.46</strong>*</td>
<td><strong>0.53</strong>*</td>
<td>0.27**</td>
<td>0.27**</td>
<td>0.18*</td>
<td>0.14</td>
</tr>
<tr>
<td>SAQsoc</td>
<td>0.14</td>
<td>0.24**</td>
<td>0.18*</td>
<td><strong>0.42</strong>*</td>
<td>0.27**</td>
<td>0.37***</td>
<td>0.28**</td>
<td>0.26**</td>
<td><strong>0.7</strong>*</td>
</tr>
<tr>
<td>SAQart</td>
<td>0.05</td>
<td>0.17*</td>
<td>0.05</td>
<td>0.24**</td>
<td>0.11</td>
<td>0.20*</td>
<td>0.10</td>
<td>0.16</td>
<td>0.10</td>
</tr>
<tr>
<td>SAQath</td>
<td><strong>0.52</strong>*</td>
<td><strong>0.54</strong>*</td>
<td><strong>0.56</strong>*</td>
<td>0.25**</td>
<td>0.11</td>
<td>0.4***</td>
<td>0.11</td>
<td>0.5***</td>
<td>0.18*</td>
</tr>
<tr>
<td>SAQatt</td>
<td>0.29***</td>
<td><strong>0.77</strong>*</td>
<td>0.29**</td>
<td>0.28**</td>
<td><strong>0.29</strong>*</td>
<td><strong>0.68</strong>*</td>
<td>0.20*</td>
<td>0.30***</td>
<td>0.23**</td>
</tr>
<tr>
<td>SAQlead</td>
<td>0.12</td>
<td>0.08</td>
<td>0.15</td>
<td>0.34***</td>
<td>0.26**</td>
<td>0.19*</td>
<td>0.28**</td>
<td>0.26**</td>
<td><strong>0.32</strong>*</td>
</tr>
<tr>
<td>SAQcs</td>
<td>0.13</td>
<td>0.21*</td>
<td>0.18*</td>
<td>0.30***</td>
<td>0.3***</td>
<td>0.24**</td>
<td>0.28**</td>
<td>0.17*</td>
<td>0.16</td>
</tr>
<tr>
<td>SAQes</td>
<td>0.12</td>
<td>0.20*</td>
<td>0.14</td>
<td>0.23**</td>
<td>0.07</td>
<td>0.27**</td>
<td><strong>0.41</strong>*</td>
<td>0.16</td>
<td>0.12</td>
</tr>
<tr>
<td>SAQhum</td>
<td>0.17*</td>
<td>0.26**</td>
<td>0.13</td>
<td>0.24**</td>
<td>0.08</td>
<td>0.23**</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.25**</td>
</tr>
<tr>
<td>SAQdisc</td>
<td>0.12</td>
<td>0.26**</td>
<td>0.16</td>
<td>0.31***</td>
<td>0.28**</td>
<td>0.29***</td>
<td>0.25**</td>
<td>0.15</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Notes: Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. Conceptually-related relationships are bolded and underlined. SAQ = Self-Attributes Questionnaire SAQint=intellectual/academic ability, SAQsoc=social skills, SAQart=artistic and/or musical ability, SAQath=competency or skill at sports, SAQatt=physical attractiveness, SAQlead=leadership ability, SAQcs=common sense, SAQes=emotional stability, SAQhum=humour, SAQdisc=discipline. SPEC=Self-Perceived Embodied Capital Scale. SPECgrip=grip strength, SPECpA=physical attractiveness, SPECcrd=coordination, SPECvIQ=verbal intelligence, SPECgIQ=general intelligence, SPECoA=overall attractiveness, SPECeIQ=emotional intelligence, SPECstrong=overall strength, SPECsoc=social skills.
Table 4. Eigenvalues and cumulative variance accounted for principal axis factoring on items from the Self-Perceived Embodied Capital Scale and the Self-Attributes Questionnaire ($n = 172$)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalues</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.13</td>
<td>36.62</td>
</tr>
<tr>
<td>2</td>
<td>1.67</td>
<td>48.53</td>
</tr>
<tr>
<td>3</td>
<td>1.34</td>
<td>58.06</td>
</tr>
<tr>
<td>4</td>
<td>1.23</td>
<td>66.82</td>
</tr>
<tr>
<td>5</td>
<td>0.94</td>
<td>73.52</td>
</tr>
</tbody>
</table>

Table 5. Final pattern matrix from Principal Axis Factoring, using items from the Self-Perceived Embodied Capital Scale and the Self-Attributes Questionnaire. Calculated with direct oblimin rotation.

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you were one of ten people to perform a hand grip strength test, which one would you most likely be?</td>
<td>.87</td>
</tr>
<tr>
<td>If you were one of ten people to test your coordination, which one would you most likely be?</td>
<td>.42</td>
</tr>
<tr>
<td>If you were one of 10 people to have your physical attractiveness evaluated, which one would you most likely be?</td>
<td>.89</td>
</tr>
<tr>
<td>If you were one of 10 people to have your overall attractiveness evaluated (including personality, etc.), which one would you most likely be?</td>
<td>.71</td>
</tr>
<tr>
<td>If you were one of 10 people to have your verbal intelligence evaluated, which one would you most likely be?</td>
<td>-.59</td>
</tr>
<tr>
<td>If you were one of 10 people to have your general intelligence evaluated, which one would you most likely be?</td>
<td>-.81</td>
</tr>
<tr>
<td>If you were one of 10 people to have your emotional intelligence evaluated, which one would you most likely be?</td>
<td>.45</td>
</tr>
<tr>
<td>If you were one of ten people to perform an overall strength test, which one would you most likely be?</td>
<td>.91</td>
</tr>
<tr>
<td>If you were one of ten people to have your social skills tested, which one would you most likely be?</td>
<td>.99</td>
</tr>
<tr>
<td>Social skills/social competence</td>
<td>.66</td>
</tr>
<tr>
<td>Physical attractiveness</td>
<td>.88</td>
</tr>
<tr>
<td>Common sense</td>
<td>.44</td>
</tr>
<tr>
<td>Emotional stability</td>
<td>.75</td>
</tr>
<tr>
<td>Discipline</td>
<td>.55</td>
</tr>
</tbody>
</table>
Table 6. Mean, standard deviation, Cronbach’s Alphas, skewness, kurtosis, and Shapiro-Wilk statistics for measures of objective embodied capital, perceived embodied capital, self-efficacy, as well as scales of envy and relative deprivation

<table>
<thead>
<tr>
<th>Measure</th>
<th>M</th>
<th>SD</th>
<th>Alpha</th>
<th>Skew(SE)</th>
<th>Kurtosis(SE)</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat%</td>
<td>23.36</td>
<td>8.82</td>
<td>.98</td>
<td>0.34</td>
<td>-0.24</td>
<td>0.98*</td>
</tr>
<tr>
<td>Height</td>
<td>168.96</td>
<td>9.40</td>
<td>.41</td>
<td>-0.03</td>
<td>0.98*</td>
<td></td>
</tr>
<tr>
<td>Musc%</td>
<td>39.13</td>
<td>5.64</td>
<td>-1.40</td>
<td>4.26</td>
<td>0.88***</td>
<td></td>
</tr>
<tr>
<td>Vint</td>
<td>6.10</td>
<td>1.82</td>
<td>-0.75</td>
<td>0.57</td>
<td>0.94***</td>
<td></td>
</tr>
<tr>
<td>Grip</td>
<td>34.12</td>
<td>10.19</td>
<td>0.89</td>
<td>0.48</td>
<td>0.94***</td>
<td></td>
</tr>
<tr>
<td>PegTime</td>
<td>20.09</td>
<td>2.00</td>
<td>0.96</td>
<td>1.26</td>
<td>3.05</td>
<td>0.93***</td>
</tr>
<tr>
<td>PegDif</td>
<td>2.10</td>
<td>1.18</td>
<td>0.39</td>
<td>-0.19</td>
<td>0.98*</td>
<td></td>
</tr>
<tr>
<td>pAttract</td>
<td>0</td>
<td>0.95</td>
<td>-0.34</td>
<td>0.74</td>
<td>0.98*</td>
<td></td>
</tr>
<tr>
<td>pSocSkill</td>
<td>0</td>
<td>0.99</td>
<td>-0.07</td>
<td>-0.58</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>pAthlet</td>
<td>0</td>
<td>0.95</td>
<td>-0.12</td>
<td>-0.37</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>pEmotSkill</td>
<td>0</td>
<td>0.85</td>
<td>0.03</td>
<td>-0.31</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>pIQ</td>
<td>0</td>
<td>0.89</td>
<td>-0.24</td>
<td>0.43</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>PhysEffppa</td>
<td>35.85</td>
<td>7.7</td>
<td>0.81</td>
<td>-0.02</td>
<td>-0.37</td>
<td>0.99</td>
</tr>
<tr>
<td>PhysEffspc</td>
<td>45.78</td>
<td>7.7</td>
<td>0.69</td>
<td>-0.09</td>
<td>-0.21</td>
<td>0.99</td>
</tr>
<tr>
<td>SocEff</td>
<td>100.18</td>
<td>23.35</td>
<td>0.95</td>
<td>-0.36</td>
<td>-0.05</td>
<td>0.99</td>
</tr>
<tr>
<td>GenEff</td>
<td>44.85</td>
<td>5.88</td>
<td>0.90</td>
<td>-0.34</td>
<td>0.45</td>
<td>0.98**</td>
</tr>
<tr>
<td>DES</td>
<td>18.17</td>
<td>5.86</td>
<td>0.85</td>
<td>0.34</td>
<td>-0.18</td>
<td>0.98*</td>
</tr>
<tr>
<td>Benvy</td>
<td>20.44</td>
<td>4.97</td>
<td>0.80</td>
<td>-0.42</td>
<td>0.24</td>
<td>0.98*</td>
</tr>
<tr>
<td>Menvy</td>
<td>10.98</td>
<td>4.66</td>
<td>0.85</td>
<td>0.82</td>
<td>0.72</td>
<td>0.94***</td>
</tr>
<tr>
<td>PRD</td>
<td>13.84</td>
<td>4.64</td>
<td>0.70</td>
<td>0.22</td>
<td>-0.68</td>
<td>0.98**</td>
</tr>
<tr>
<td>DSESatt</td>
<td>14.29</td>
<td>6.72</td>
<td>0.86</td>
<td>0.73</td>
<td>0.02</td>
<td>0.94***</td>
</tr>
<tr>
<td>DSEScomp</td>
<td>16.05</td>
<td>6.93</td>
<td>0.86</td>
<td>0.31</td>
<td>-0.45</td>
<td>0.97**</td>
</tr>
<tr>
<td>DSESwealth</td>
<td>11.54</td>
<td>6.33</td>
<td>0.87</td>
<td>1.53</td>
<td>2.91</td>
<td>0.86***</td>
</tr>
</tbody>
</table>

Notes: α ≥ 0.9: excellent, 0.9 > α ≥ 0.8: good, 0.8 > α ≥ 0.7: acceptable (Streiner, 2003). Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001.

Fat% = body fat percentage, Musc% = muscle percentage, Vint = performance on verbal intelligence task, PegTime = completion time of Peg Task, PegDif = between-hand difference in completion time of the Peg Task, pAttract = perceived attractiveness, pSocSkill = perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, PhysEffppa = physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence, SocEff = social self-efficacy, GenEff = general self-efficacy, DES = Dispositional Envy Scale, PRD = Personal Relative Deprivation Scale-Revised, DSESatt = attraction subscale of the Domain-Specific Envy Scale, DSEScomp = competence subscale of the Domain-Specific Envy Scale, DSESwealth = wealth subscale of the Domain-Specific Envy Scale, Benvy = benign envy subscale of the Benign and Malicious Envy Scale, Menvy = malicious envy component of the Benign and Malicious Envy Scale. For skewness, all standard errors fell between 0.17 and 0.20, inclusive. For kurtosis, all standard errors fell between 0.35 and 0.39, inclusive. Skewness values exceeding +/- .8 are bolded, as are kurtosis statistics exceeding +/- 3.
Table 7. Bootstrapped correlations between objective indices of embodied capital, controlling for age and gender ($n=100$).

<table>
<thead>
<tr>
<th></th>
<th>Fat%</th>
<th>HeightCM</th>
<th>Musc%</th>
<th>Vint</th>
<th>Grip</th>
<th>PegTime</th>
</tr>
</thead>
<tbody>
<tr>
<td>HeightCM</td>
<td>0.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musc%</td>
<td>-0.85***</td>
<td>-0.20*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vint</td>
<td>0.01</td>
<td>0.15</td>
<td>-0.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grip</td>
<td>0.08</td>
<td>0.33**</td>
<td>-0.15</td>
<td>0.25*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PegTime</td>
<td>-0.03</td>
<td>-0.10</td>
<td>-0.03</td>
<td>-0.04</td>
<td>-0.27**</td>
<td></td>
</tr>
<tr>
<td>PegDif</td>
<td>0.20*</td>
<td>0.03</td>
<td>-0.17</td>
<td>-0.01</td>
<td>-0.12</td>
<td>0.20*</td>
</tr>
</tbody>
</table>

Notes: Significance tests were two-tailed. * $p < .05$; ** $p < .01$; *** $p < .001$.
Fat% = body fat percentage, Musc% = muscle percentage, Vint = performance on verbal intelligence task, PegTime = completion time of peg task, PegDif = between-hand difference in completion time of the peg task,
Table 8. Bootstrapped partial correlations between measures of perceived embodied capital and self-efficacy (n = 100).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>pSocSkill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pAthlet</td>
<td>0.35***</td>
<td>0.36***</td>
<td>0.46***</td>
<td>0.23*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pEmotSkill</td>
<td>0.44***</td>
<td>0.34***</td>
<td>0.42***</td>
<td>0.39***</td>
<td>0.42***</td>
<td>0.26*</td>
<td>0.14</td>
<td>-0.17</td>
</tr>
<tr>
<td>pIQ</td>
<td>0.48***</td>
<td>0.42***</td>
<td>0.61***</td>
<td>0.12</td>
<td>-0.14</td>
<td>0.12</td>
<td>0.49***</td>
<td>0.20*</td>
</tr>
<tr>
<td>PhysEffppa</td>
<td>0.42***</td>
<td>0.26*</td>
<td>0.14</td>
<td>0.49***</td>
<td>-0.14</td>
<td>0.26*</td>
<td>0.22*</td>
<td>0.37***</td>
</tr>
<tr>
<td>PhysEffspc</td>
<td>0.39***</td>
<td>0.22*</td>
<td>0.14</td>
<td>0.49***</td>
<td>-0.14</td>
<td>0.14</td>
<td>0.49***</td>
<td>0.22*</td>
</tr>
<tr>
<td>SocEff</td>
<td>0.41***</td>
<td>0.66***</td>
<td>0.21*</td>
<td>0.4***</td>
<td>-0.34**</td>
<td>0.24*</td>
<td>0.37***</td>
<td></td>
</tr>
<tr>
<td>GenEff</td>
<td>0.37***</td>
<td>0.30**</td>
<td>0.19</td>
<td>0.49***</td>
<td>-0.55***</td>
<td>0.22*</td>
<td>0.35***</td>
<td>0.39***</td>
</tr>
</tbody>
</table>

Notes: Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. pAttract = perceived attractiveness, pSocSkill = perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, PhysEffppa = physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence, SocEff = Social self-efficacy, GenEff = general self-efficacy.
Table 9. Bootstrapped partial correlations between objective and subjective indices of embodied capital, as well as self-efficacy, controlling for age and gender (n = 100).

<table>
<thead>
<tr>
<th></th>
<th>Fat%</th>
<th>HeightCM</th>
<th>Musc%</th>
<th>Vint</th>
<th>Grip</th>
<th>PegTime</th>
<th>PegDif</th>
</tr>
</thead>
<tbody>
<tr>
<td>pAttract</td>
<td>-0.47***</td>
<td>0.09</td>
<td>0.34**</td>
<td>0.22*</td>
<td>0.09</td>
<td>0.02</td>
<td>-0.06</td>
</tr>
<tr>
<td>pSocSkill</td>
<td>-0.08</td>
<td>-0.02</td>
<td>0.11</td>
<td>0.16</td>
<td>-0.02</td>
<td>0.04</td>
<td>-0.04</td>
</tr>
<tr>
<td>pAthlet</td>
<td>-0.16</td>
<td>0.06</td>
<td>0.18</td>
<td>-0.04</td>
<td>0.25*</td>
<td>-0.002</td>
<td>0.02</td>
</tr>
<tr>
<td>pEmotSkill</td>
<td>-0.19</td>
<td>0.13</td>
<td>0.16</td>
<td>0.22*</td>
<td>0.11</td>
<td>-0.004</td>
<td>-0.16</td>
</tr>
<tr>
<td>pIQ</td>
<td>-0.12</td>
<td>0.12</td>
<td>0.13</td>
<td>0.4***</td>
<td>0.06</td>
<td>-0.001</td>
<td>0.04</td>
</tr>
<tr>
<td>PSEppa</td>
<td>-0.41***</td>
<td>-0.11</td>
<td>0.33**</td>
<td>-0.06</td>
<td>0.30**</td>
<td>-0.24*</td>
<td>-0.13</td>
</tr>
<tr>
<td>PSEspc</td>
<td>-0.19</td>
<td>-0.02</td>
<td>0.17</td>
<td>-0.04</td>
<td>-0.01</td>
<td>-0.16</td>
<td>-0.09</td>
</tr>
<tr>
<td>SocEff</td>
<td>-0.14</td>
<td>-0.18</td>
<td>0.19</td>
<td>0.06</td>
<td>-0.10</td>
<td>-0.08</td>
<td>0.01</td>
</tr>
<tr>
<td>GenEff</td>
<td>-0.15</td>
<td>-0.02</td>
<td>0.15</td>
<td>0.27**</td>
<td>0.16</td>
<td>-0.23*</td>
<td>-0.14</td>
</tr>
</tbody>
</table>

Notes: Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. Fat%=body fat percentage, Muscle=muscle percentage, Vint=performance on verbal intelligence task, PegTime=completion time of Peg Task, PegDif= between-hand difference in completion time of the Peg Task, pAttract = perceived attractiveness, pSocSkill= perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, PhysEffppa= physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence, SocEff=Social self-efficacy, GenEff=general self-efficacy.

Table 10. Bootstrapped partial correlations between scales measuring envy and relative deprivation, controlling for age and gender (n = 100).

<table>
<thead>
<tr>
<th></th>
<th>DES</th>
<th>PRDS</th>
<th>DSESatt</th>
<th>DSEScomp</th>
<th>DSESwealth</th>
<th>Benvy</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRDS</td>
<td>0.4***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSESatt</td>
<td>0.52***</td>
<td>0.35***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSEScomp</td>
<td>0.28**</td>
<td>0.11</td>
<td>0.64***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSESwealth</td>
<td>0.47***</td>
<td>0.28**</td>
<td>0.63***</td>
<td>0.58***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benvy</td>
<td>0.29**</td>
<td>0.15</td>
<td>0.34**</td>
<td>0.39***</td>
<td>0.26**</td>
<td></td>
</tr>
<tr>
<td>Menvy</td>
<td>0.63***</td>
<td>0.42***</td>
<td>0.51***</td>
<td>0.41***</td>
<td>0.59***</td>
<td>0.28**</td>
</tr>
</tbody>
</table>

Notes: Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. DES = Dispositional Envy Scale, PRDS=Personal Relative Deprivation Scale-Revised, DSESatt=attraction subscale of the Domain-Specific Envy Scale, DSEScomp=competence subscale of the Domain-Specific Envy Scale, DSESwealth=wealth subscale of the Domain-Specific Envy Scale, Benvy=benign envy subscale of the Benign and Malicious Envy Scale, Menvy=malicious envy component of the Benign and Malicious Envy Scale.
Table 11. Bootstrapped partial correlations between measures of envy/relative deprivation and embodied capital, controlling for age and gender (n = 100)

<table>
<thead>
<tr>
<th></th>
<th>DES</th>
<th>PRDS</th>
<th>DSESatt</th>
<th>DSEScomp</th>
<th>DSESwealth</th>
<th>Benvy</th>
<th>Menvy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat%</td>
<td>0.20*</td>
<td>0.07</td>
<td>0.15</td>
<td>-0.02</td>
<td>0.13</td>
<td>0.02</td>
<td>0.17</td>
</tr>
<tr>
<td>HeightCM</td>
<td>-0.03</td>
<td>-0.17</td>
<td>-0.11</td>
<td>0.11</td>
<td>-0.03</td>
<td>0.09</td>
<td>0.14</td>
</tr>
<tr>
<td>Musc%</td>
<td>-0.17</td>
<td>-0.03</td>
<td>-0.12</td>
<td>0.04</td>
<td>-0.10</td>
<td>-0.12</td>
<td>-0.13</td>
</tr>
<tr>
<td>Vint</td>
<td>-0.04</td>
<td>-0.35***</td>
<td>-0.12</td>
<td>0.03</td>
<td>-0.13</td>
<td>-0.01</td>
<td>-0.17</td>
</tr>
<tr>
<td>Grip</td>
<td>-0.13</td>
<td>-0.17</td>
<td>-0.06</td>
<td>0.07</td>
<td>-0.01</td>
<td>0.08</td>
<td>-0.03</td>
</tr>
<tr>
<td>PegTime</td>
<td>0.16</td>
<td>0.11</td>
<td>0.02</td>
<td>0.11</td>
<td>0.16</td>
<td>-0.03</td>
<td>0.12</td>
</tr>
<tr>
<td>PegDiff</td>
<td>0.22*</td>
<td>0.02</td>
<td>0.10</td>
<td>-0.01</td>
<td>-0.02</td>
<td>-0.10</td>
<td>0.16</td>
</tr>
<tr>
<td>pAttract</td>
<td>-0.22*</td>
<td>-0.11</td>
<td>-0.13</td>
<td>0.12</td>
<td>-0.12</td>
<td>-0.003</td>
<td>-0.04</td>
</tr>
<tr>
<td>pSocSkill</td>
<td>-0.2*</td>
<td>-0.24*</td>
<td>-0.15</td>
<td>-0.01</td>
<td>-0.26**</td>
<td>-0.03</td>
<td>-0.17</td>
</tr>
<tr>
<td>pAthlet</td>
<td>-0.07</td>
<td>-0.07</td>
<td>-0.01</td>
<td>0.14</td>
<td>-0.02</td>
<td>0.01</td>
<td>0.03</td>
</tr>
<tr>
<td>pEmotSkill</td>
<td>-0.44***</td>
<td>-0.28**</td>
<td>-0.31**</td>
<td>0.02</td>
<td>-0.17</td>
<td>0.07</td>
<td>-0.2*</td>
</tr>
<tr>
<td>pIQ</td>
<td>-0.14</td>
<td>-0.22*</td>
<td>-0.11</td>
<td>0.13</td>
<td>-0.13</td>
<td>0.02</td>
<td>-0.05</td>
</tr>
<tr>
<td>PSEppa</td>
<td>-0.16</td>
<td>-0.05</td>
<td>-0.04</td>
<td>0.01</td>
<td>-0.09</td>
<td>0.11</td>
<td>-0.10</td>
</tr>
<tr>
<td>PSEspc</td>
<td>-0.59***</td>
<td>-0.29**</td>
<td>-0.49***</td>
<td>-0.33**</td>
<td>-0.42***</td>
<td>-0.27**</td>
<td>-0.41***</td>
</tr>
<tr>
<td>SocEff</td>
<td>-0.42***</td>
<td>-0.21*</td>
<td>-0.10</td>
<td>0.02</td>
<td>-0.23*</td>
<td>-0.07</td>
<td>-0.24*</td>
</tr>
<tr>
<td>GenEff</td>
<td>-0.46***</td>
<td>-0.33***</td>
<td>-0.25*</td>
<td>-0.02</td>
<td>-0.24*</td>
<td>0.14</td>
<td>-0.34***</td>
</tr>
</tbody>
</table>

Notes: Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. Fat% = body fat percentage, Musc% = muscle percentage, Vint = performance on verbal intelligence task, PegTime = completion time of Peg Task, PegDif = between-hand difference in completion time of the Peg Task, pAttract = perceived attractiveness, pSocSkill = perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, PhysEffppa = physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence, SocEff = Social self-efficacy, GenEff = general self-efficacy. DES = Dispositional Envy Scale, PRD = Personal Relative Deprivation Scale-Revised, DSESatt = attraction subscale of the Domain-Specific Envy Scale, DSEScomp = competence subscale of the Domain-Specific Envy Scale, DSESwealth = wealth subscale of the Domain-Specific Envy Scale, Benvy = benign envy subscale of the Benign and Malicious Envy Scale, Menvy = malicious envy component of the Benign and Malicious Envy Scale.
Table 12. Final model of hierarchical multiple regression analysis of scores on the Dispositional Envy Scale (n=109)

<table>
<thead>
<tr>
<th>DES</th>
<th>B (SE)</th>
<th>Bias</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: R^2_{adj} =0.02; \Delta R^2 = 0.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.10 (0.12)</td>
<td>0.01</td>
<td>0.34</td>
<td>[-0.19, 0.44]</td>
</tr>
<tr>
<td>Gender</td>
<td>-2.66 (1.81)</td>
<td>0.01</td>
<td>0.16</td>
<td>[-6.19, 1.16]</td>
</tr>
<tr>
<td>Step 2: R^2_{adj} =0.08; \Delta R^2 = 0.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>-0.06 (0.11)</td>
<td>0.01</td>
<td>0.56</td>
<td>[-0.28, 0.18]</td>
</tr>
<tr>
<td>Fat%</td>
<td>0.15 (0.10)</td>
<td>0.002</td>
<td>0.12</td>
<td>[-0.05, 0.35]</td>
</tr>
<tr>
<td>Musc%</td>
<td>0.14 (0.13)</td>
<td>0.02</td>
<td>0.31</td>
<td>[-0.18, 0.41]</td>
</tr>
<tr>
<td>Grip</td>
<td>-0.10 (0.08)</td>
<td>-0.01</td>
<td>0.21</td>
<td>[-0.23, 0.02]</td>
</tr>
<tr>
<td>PegTime</td>
<td>0.01 (0.13)</td>
<td>-0.01</td>
<td>0.92</td>
<td>[-0.28, 0.22]</td>
</tr>
<tr>
<td>PegDif</td>
<td>0.53 (0.37)</td>
<td>-0.004</td>
<td>0.16</td>
<td>[-0.22, 1.28]</td>
</tr>
<tr>
<td>Vint</td>
<td>0.18 (0.31)</td>
<td>-0.04</td>
<td>0.56</td>
<td>[-0.37, 0.67]</td>
</tr>
<tr>
<td>Step 3: R^2_{adj} =0.23; \Delta R^2 = 0.17**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pAttract</td>
<td>1.16 (0.65)</td>
<td>0.02</td>
<td>0.06</td>
<td>[0.04, 2.44]</td>
</tr>
<tr>
<td>pSocSkill</td>
<td>0.78 (0.65)</td>
<td>0.05</td>
<td>0.25</td>
<td>[-0.64, 2.15]</td>
</tr>
<tr>
<td>pAthlet</td>
<td>-0.27 (0.73)</td>
<td>-0.06</td>
<td>0.68</td>
<td>[-1.70, 1.02]</td>
</tr>
<tr>
<td>pEmotSkill</td>
<td>-0.80 (0.82)</td>
<td>-0.06</td>
<td>0.32</td>
<td>[-2.26, 0.6]</td>
</tr>
<tr>
<td>pIQ</td>
<td>0.01 (0.77)</td>
<td>-0.04</td>
<td>0.99</td>
<td>[-1.74, 1.64]</td>
</tr>
<tr>
<td>Step 4: R^2_{adj} =0.47; \Delta R^2 = 0.23***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GenEff</td>
<td>-0.22 (0.13)</td>
<td>0.01</td>
<td>0.09</td>
<td>[-0.49, 0.05]</td>
</tr>
<tr>
<td>PhysEffppa</td>
<td>-0.38 (0.08)</td>
<td>0.001</td>
<td>0.001</td>
<td>[-0.54, -0.21]</td>
</tr>
</tbody>
</table>

Notes: For Gender, 1 = male, 2 = female. Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. Predictors whose p-values < .05 are bolded. Fat% = body fat percentage, Musc% = muscle percentage, Vint = performance on verbal intelligence task, PegTime = completion time of Peg Task, PegDif = between-hand difference in completion time of the Peg Task, pAttract = perceived attractiveness, pSocSkill = perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, SocEff = Social self-efficacy, GenEff = general self-efficacy, PhysEffppa = physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence.
Table 13. Final bootstrapped model of hierarchical multiple regression analysis of scores on the Personal Relative Deprivation Scale-Revised (n=110)

<table>
<thead>
<tr>
<th>PRDS</th>
<th>B (SE)</th>
<th>Bias</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.15 (0.12)</td>
<td>0.004</td>
<td>0.19</td>
<td>[-0.08, 0.41]</td>
</tr>
<tr>
<td>Gender</td>
<td>-2.44 (1.78)</td>
<td>0.004</td>
<td>0.18</td>
<td>[-5.75, 1.03]</td>
</tr>
<tr>
<td><strong>Step 1:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²_adj =0.01; ΔR² = 0.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>-0.09 (0.07)</td>
<td>0.02</td>
<td>0.22</td>
<td>[-0.26, 0.11]</td>
</tr>
<tr>
<td>Fat%</td>
<td>0.13 (0.10)</td>
<td>-0.004</td>
<td>0.17</td>
<td>[-0.05, 0.31]</td>
</tr>
<tr>
<td>Musc%</td>
<td>0.07 (0.12)</td>
<td>-0.01</td>
<td>0.52</td>
<td>[-0.16, 0.29]</td>
</tr>
<tr>
<td>Grip</td>
<td>-0.06 (0.08)</td>
<td>-0.01</td>
<td>0.47</td>
<td>[-0.23, 0.08]</td>
</tr>
<tr>
<td>PegTime</td>
<td>0.01 (0.10)</td>
<td>0.004</td>
<td>0.95</td>
<td>[-0.18, 0.20]</td>
</tr>
<tr>
<td>PegDif</td>
<td>-0.23 (0.36)</td>
<td>-0.03</td>
<td>0.52</td>
<td>[-0.96, 0.41]</td>
</tr>
<tr>
<td><strong>Vint</strong></td>
<td><strong>-0.84 (0.28)</strong></td>
<td><strong>-0.02</strong></td>
<td><strong>0.01</strong></td>
<td><strong>[-1.35, -0.38]</strong></td>
</tr>
<tr>
<td><strong>Step 2:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²_adj =0.13; ΔR² = 0.18**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pAttract</td>
<td><strong>1.49 (0.66)</strong></td>
<td><strong>-0.09</strong></td>
<td><strong>0.04</strong></td>
<td><strong>[0.31, 2.53]</strong></td>
</tr>
<tr>
<td>pSocSkill</td>
<td>-0.59 (0.68)</td>
<td>0.05</td>
<td>0.40</td>
<td>[-2.09, 0.93]</td>
</tr>
<tr>
<td>pAthlet</td>
<td>-0.46 (0.74)</td>
<td>-0.01</td>
<td>0.52</td>
<td>[-1.92, 0.94]</td>
</tr>
<tr>
<td>pEmotSkill</td>
<td>-0.13 (0.69)</td>
<td>-0.001</td>
<td>0.82</td>
<td>[-1.34, 1.23]</td>
</tr>
<tr>
<td>pIQ</td>
<td>0.24 (0.72)</td>
<td>-0.04</td>
<td>0.73</td>
<td>[-1.31, 1.58]</td>
</tr>
<tr>
<td><strong>Step 3:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²_adj =0.17; ΔR² = 0.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GenEff</td>
<td>-0.15 (0.11)</td>
<td>0.01</td>
<td>0.17</td>
<td>[-0.35, 0.08]</td>
</tr>
<tr>
<td>SocEff</td>
<td>-0.01 (0.03)</td>
<td>-0.002</td>
<td>0.66</td>
<td>[-0.06, 0.03]</td>
</tr>
<tr>
<td>PhysEffppa</td>
<td>0.05 (0.09)</td>
<td>-0.01</td>
<td>0.59</td>
<td>[-0.13, 0.22]</td>
</tr>
<tr>
<td><strong>PhysEffspc</strong></td>
<td><strong>-0.19 (0.08)</strong></td>
<td><strong>0.003</strong></td>
<td><strong>0.02</strong></td>
<td><strong>[-0.33, -0.04]</strong></td>
</tr>
</tbody>
</table>

Notes: For Gender, 1 = male, 2 = female. Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. Predictors whose p-values < .05 are bolded. Fat%=body fat percentage, Musc%=muscle percentage, Vint=performance on verbal intelligence task, PegTime=completion time of Peg Task, PegDif= between-hand difference in completion time of the Peg Task, pAttract = perceived attractiveness, pSocSkill= perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, SocEff=Social self-efficacy, GenEff=general self-efficacy, PhysEffppa= physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence.
Table 14. Final bootstrapped model of hierarchical multiple regression analysis of scores on the attraction subscale of the Domain-Specific Envy Scale (n=110).

<table>
<thead>
<tr>
<th>DSESattract</th>
<th>B (SE)</th>
<th>Bias</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.07 (0.20)</td>
<td>0.02</td>
<td>0.70</td>
<td>[-0.34, 0.41]</td>
</tr>
<tr>
<td>Gender</td>
<td>-4.37 (2.41)</td>
<td>0.02</td>
<td>0.08</td>
<td>[-8.75, 0.44]</td>
</tr>
</tbody>
</table>

Step 2: $R^2_{adj} = -0.03; \Delta R^2 = 0.04$

| Height      | -0.11 (0.12)  | 0.01 | 0.35 | [-0.33, 0.14]  |
| Fat%        | 0.12 (0.13)   | 0.01 | 0.34 | [-0.15, 0.41]  |
| Musc%       | 0.09 (0.14)   | 0.02 | 0.52 | [-0.27, 0.37]  |
| Grip        | 0.01 (0.10)   | -0.01| 0.95 | [-0.19, 0.19]  |
| PegTime     | -0.18 (0.15)  | 0.004| 0.22 | [-0.44, 0.13]  |
| PegDif      | 0.12 (0.53)   | -0.04| 0.82 | [-0.87, 0.98]  |
| Vint        | -0.22 (0.44)  | 0.03 | 0.63 | [-1.19, 0.70]  |

Step 3: $R^2_{adj} = -0.01; \Delta R^2 = 0.06$

| pAttract    | 1.42 (1.02)   | 0.04 | 0.16 | [-0.60, 3.60]  |
| pSocSkill   | -0.74 (0.91)  | 0.11 | 0.42 | [-2.70, 1.46]  |
| pAthlet     | 0.12 (1.06)   | -0.11| 0.91 | [-1.76, 1.87]  |
| pEmotSkill  | -0.23 (1.18)  | -0.01| 0.83 | [-2.53, 2.04]  |
| pIQ         | -0.17 (0.97)  | -0.10| 0.86 | [-2.43, 1.71]  |

Step 4: $R^2_{adj} = 0.17; \Delta R^2 = 0.19$***

| GenEff      | -0.11 (0.17)  | 0.00 | 0.51 | [-0.45, 0.23]  |
| SocEff      | 0.03 (0.04)   | 0.001| 0.41 | [-0.04, 0.11]  |
| PhysEffppa  | 0.01 (0.12)   | 0.01 | 0.95 | [-0.26, 0.30]  |
| physEffspc  | **-0.49 (0.11)** | **-0.01** | **0.001** | **[-0.68, -0.31]** |

Notes: For Gender, 1 = male, 2 = female. Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. Predictors whose p-values < .05 are bolded. Fat%=body fat percentage, Musc%=muscle percentage, Vint=performance on verbal intelligence task, PegTime=completion time of Peg Task, PegDif= between-hand difference in completion time of the Peg Task, pAttract = perceived attractiveness, pSocSkill= perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, SocEff=Social self-efficacy, GenEff=general self-efficacy, PhysEffppa= physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence.
Table 15. Final bootstrapped model of hierarchical multiple regression analysis of scores on the competence subscale of the Domain-Specific Envy Scale (n=110).

<table>
<thead>
<tr>
<th>DSEScomp</th>
<th>B (SE)</th>
<th>Bias</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: $R^2_{adj} = -0.01; \Delta R^2 = 0.01$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.05 (0.20)</td>
<td>0.03</td>
<td>0.78</td>
<td>[-0.37, 0.47]</td>
</tr>
<tr>
<td>Gender</td>
<td>2.77 (3.00)</td>
<td>0.14</td>
<td>0.36</td>
<td>[-3.16, 9.19]</td>
</tr>
<tr>
<td>Step 2: $R^2_{adj} = -0.03; \Delta R^2 = 0.05$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>0.08 (0.10)</td>
<td>0.003</td>
<td>0.48</td>
<td>[-0.13, 0.28]</td>
</tr>
<tr>
<td>Fat%</td>
<td>-0.01 (0.12)</td>
<td>0.01</td>
<td>0.94</td>
<td>[-0.24, 0.26]</td>
</tr>
<tr>
<td>Musc%</td>
<td>0.10 (0.12)</td>
<td>0.02</td>
<td>0.37</td>
<td>[-0.15, 0.39]</td>
</tr>
<tr>
<td>Grip</td>
<td>0.08 (0.12)</td>
<td>-0.002</td>
<td>0.49</td>
<td>[-0.16, 0.31]</td>
</tr>
<tr>
<td>PegTime</td>
<td>0.04 (0.16)</td>
<td>0.004</td>
<td>0.78</td>
<td>[-0.33, 0.37]</td>
</tr>
<tr>
<td>PegDif</td>
<td>-0.30 (0.53)</td>
<td>0.01</td>
<td>0.59</td>
<td>[-1.26, 0.74]</td>
</tr>
<tr>
<td>Vint</td>
<td>0.01 (0.50)</td>
<td>-0.01</td>
<td>0.99</td>
<td>[-1.03, 1.00]</td>
</tr>
<tr>
<td>Step 3: $R^2_{adj} = -0.06; \Delta R^2 = 0.02$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pAttract</td>
<td>0.88 (0.87)</td>
<td>0.08</td>
<td>0.30</td>
<td>[-0.95, 2.93]</td>
</tr>
<tr>
<td>pSocSkill</td>
<td>-0.89 (0.98)</td>
<td>0.11</td>
<td>0.36</td>
<td>[-3.00, 1.47]</td>
</tr>
<tr>
<td>pAthlet</td>
<td>0.89 (1.17)</td>
<td>-0.09</td>
<td>0.44</td>
<td>[-1.30, 2.90]</td>
</tr>
<tr>
<td>pEmotSkill</td>
<td>0.71 (0.97)</td>
<td>0.01</td>
<td>0.47</td>
<td>[-1.19, 2.59]</td>
</tr>
<tr>
<td>pIQ</td>
<td>0.22 (1.17)</td>
<td>-0.05</td>
<td>0.84</td>
<td>[-2.23, 2.62]</td>
</tr>
<tr>
<td>Step 4: $R^2_{adj} = 0.09; \Delta R^2 = 0.16**$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GenEff</td>
<td>0.02 (0.17)</td>
<td>0.01</td>
<td>0.90</td>
<td>[-0.36, 0.37]</td>
</tr>
<tr>
<td>SocEff</td>
<td>0.05 (0.04)</td>
<td>0.001</td>
<td>0.17</td>
<td>[-0.03, 0.13]</td>
</tr>
<tr>
<td>PhysEffppa</td>
<td>-0.07 (0.13)</td>
<td>0.01</td>
<td>0.60</td>
<td>[-0.34, 0.21]</td>
</tr>
<tr>
<td>PhysEffspc</td>
<td><strong>-0.44 (0.10)</strong></td>
<td><strong>-0.02</strong></td>
<td><strong>0.001</strong></td>
<td>[-0.62, -0.30]</td>
</tr>
</tbody>
</table>

Notes: For Gender, 1 = male, 2 = female. Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. Predictors whose p-values < .05 are bolded. Fat% = body fat percentage, Musc% = muscle percentage, Vint = performance on verbal intelligence task, PegTime = completion time of Peg Task, PegDif = between-hand difference in completion time of the Peg Task, pAttract = perceived attractiveness, pSocSkill = perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, SocEff = Social self-efficacy, GenEff = general self-efficacy, PhysEffppa = physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence.
Table 16. Final bootstrapped model of hierarchical multiple regression analysis of scores on the wealth subscale of the Domain-Specific Envy Scale (n=110).

<table>
<thead>
<tr>
<th>DSESwealth</th>
<th>B (SE)</th>
<th>Bias</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: $R^2_{adj} = 0; \Delta R^2 = 0.02$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.12 (0.14)</td>
<td>0.02</td>
<td>0.39</td>
<td>[-0.42, 0.22]</td>
</tr>
<tr>
<td>Gender</td>
<td>-1.75 (2.29)</td>
<td>0.14</td>
<td>0.47</td>
<td>[-5.93, 3.27]</td>
</tr>
<tr>
<td>Step 2: $R^2_{adj} = 0.01; \Delta R^2 = 0.07$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>-0.06 (0.10)</td>
<td>-0.001</td>
<td>0.57</td>
<td>[-0.26, 0.15]</td>
</tr>
<tr>
<td>Fat%</td>
<td>0.14 (0.12)</td>
<td>0.003</td>
<td>0.26</td>
<td>[-0.09, 0.39]</td>
</tr>
<tr>
<td>Musc%</td>
<td>0.13 (0.12)</td>
<td>0.01</td>
<td>0.27</td>
<td>[-0.14, 0.42]</td>
</tr>
<tr>
<td>Grip</td>
<td>0.03 (0.10)</td>
<td>0.004</td>
<td>0.73</td>
<td>[-0.17, 0.25]</td>
</tr>
<tr>
<td>PegTime</td>
<td>0.12 (0.12)</td>
<td>0.01</td>
<td>0.33</td>
<td>[-0.20, 0.42]</td>
</tr>
<tr>
<td>PegDif</td>
<td>-0.45 (0.53)</td>
<td>-0.003</td>
<td>0.42</td>
<td>[-1.58, 0.55]</td>
</tr>
<tr>
<td>Vint</td>
<td>-0.26 (0.48)</td>
<td>-0.003</td>
<td>0.59</td>
<td>[-1.22, 0.69]</td>
</tr>
<tr>
<td>Step 3: $R^2_{adj} = 0.03; \Delta R^2 = 0.07$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pAttract</td>
<td>1.08 (1.04)</td>
<td>0.17</td>
<td>0.30</td>
<td>[-1.03, 3.95]</td>
</tr>
<tr>
<td>pSocSkill</td>
<td>-1.17 (0.89)</td>
<td>0.11</td>
<td>0.21</td>
<td>[-3.23, 0.80]</td>
</tr>
<tr>
<td>pAthlet</td>
<td>0.18 (1.08)</td>
<td>-0.08</td>
<td>0.87</td>
<td>[-1.94, 2.13]</td>
</tr>
<tr>
<td>pEmotSkill</td>
<td>0.79 (1.05)</td>
<td>-0.11</td>
<td>0.46</td>
<td>[-1.15, 2.47]</td>
</tr>
<tr>
<td>pIQ</td>
<td>-0.21 (1.09)</td>
<td>-0.17</td>
<td>0.86</td>
<td>[-3.04, 1.87]</td>
</tr>
<tr>
<td>Step 4: $R^2_{adj} = 0.14; \Delta R^2 = 0.13**$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GenEff</td>
<td>-0.06 (0.16)</td>
<td>0.01</td>
<td>0.73</td>
<td>[-0.39, 0.30]</td>
</tr>
<tr>
<td>SocEff</td>
<td>-0.01 (0.04)</td>
<td>0.002</td>
<td>0.79</td>
<td>[-0.08, 0.07]</td>
</tr>
<tr>
<td>PhysEffpaa</td>
<td>0.03 (0.11)</td>
<td>0.002</td>
<td>0.79</td>
<td>[-0.19, 0.26]</td>
</tr>
<tr>
<td><strong>PhysEffspc</strong></td>
<td><strong>-0.36 (0.10)</strong></td>
<td><strong>-0.01</strong></td>
<td><strong>0.002 [</strong>-0.55, -0.20]**</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** For Gender, 1 = male, 2 = female. Significance tests were two-tailed. * $p < .05$; ** $p < .01$; *** $p < .001$. Predictors whose $p$-values < .05 are bolded. Fat% = body fat percentage, Musc% = muscle percentage, Vint = performance on verbal intelligence task, PegTime = completion time of Peg Task, PegDif = between-hand difference in completion time of the Peg Task, pAttract = perceived attractiveness, pSocSkill = perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, SocEff = Social self-efficacy, GenEff = general self-efficacy, PhysEffpaa = physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence.
Table 17. Final bootstrapped model of hierarchical multiple regression analysis of scores on the benign envy subscale of the Benign and Malicious Envy Scale (n=106).

<table>
<thead>
<tr>
<th>Envy</th>
<th>B (SE)</th>
<th>Bias</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong>: $R^2_{adj} = 0.03$; $\Delta R^2 = 0.05$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.03 (0.17)</td>
<td>0.06</td>
<td>0.85</td>
<td>[-0.28, 0.55]</td>
</tr>
<tr>
<td>Gender</td>
<td>-2.31 (2.21)</td>
<td>0.02</td>
<td>0.30</td>
<td>[-6.35, 2.33]</td>
</tr>
<tr>
<td><strong>Step 2</strong>: $R^2_{adj} = 0.01$; $\Delta R^2 = 0.04$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>0.08 (0.08)</td>
<td>0.001</td>
<td>0.30</td>
<td>[-0.09, 0.26]</td>
</tr>
<tr>
<td>Fat%</td>
<td>0.06 (0.11)</td>
<td>-0.03</td>
<td>0.61</td>
<td>[-0.14, 0.2]</td>
</tr>
<tr>
<td>Musc%</td>
<td>-0.07 (0.11)</td>
<td>-0.01</td>
<td>0.50</td>
<td>[-0.34, 0.13]</td>
</tr>
<tr>
<td>Grip</td>
<td>-0.03 (0.08)</td>
<td>-0.01</td>
<td>0.73</td>
<td>[-0.18, 0.1]</td>
</tr>
<tr>
<td>PegTime</td>
<td>0.02 (0.12)</td>
<td>-0.01</td>
<td>0.85</td>
<td>[-0.21, 0.24]</td>
</tr>
<tr>
<td>PegDif</td>
<td>-0.24 (0.42)</td>
<td>0.08</td>
<td>0.59</td>
<td>[-1.16, 0.82]</td>
</tr>
<tr>
<td>Vint</td>
<td>-0.34 (0.30)</td>
<td>0.003</td>
<td>0.25</td>
<td>[-0.96, 0.27]</td>
</tr>
<tr>
<td><strong>Step 3</strong>: $R^2_{adj} = -0.03$; $\Delta R^2 = 0.01$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pAttract</td>
<td>0.35 (0.70)</td>
<td>-0.01</td>
<td>0.58</td>
<td>[-1.07, 1.67]</td>
</tr>
<tr>
<td>pSocSkill</td>
<td>-0.35 (0.66)</td>
<td>0.03</td>
<td>0.61</td>
<td>[-1.82, 1.08]</td>
</tr>
<tr>
<td>pAthlet</td>
<td>-0.67 (0.99)</td>
<td>-0.14</td>
<td>0.53</td>
<td>[-2.38, 0.86]</td>
</tr>
<tr>
<td>pEmotSkill</td>
<td>1.25 (0.85)</td>
<td>-0.10</td>
<td>0.14</td>
<td>[-0.26, 2.58]</td>
</tr>
<tr>
<td>pIQ</td>
<td>-0.45 (0.91)</td>
<td>-0.02</td>
<td>0.63</td>
<td>[-2.26, 1.39]</td>
</tr>
<tr>
<td><strong>Step 4</strong>: $R^2_{adj} = 0.13$; $\Delta R^2 = 0.17**$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GenEff</td>
<td>0.24 (0.12)</td>
<td>-0.003</td>
<td>0.06</td>
<td>[0.00, 0.51]</td>
</tr>
<tr>
<td>SocEff</td>
<td>0.00 (0.03)</td>
<td>0.01</td>
<td>0.99</td>
<td>[-0.06, 0.07]</td>
</tr>
<tr>
<td>PhysEffppa</td>
<td>0.16 (0.1)</td>
<td>0.01</td>
<td>0.11</td>
<td>[-0.04, 0.40]</td>
</tr>
<tr>
<td><strong>PhysEffspc</strong></td>
<td><strong>-0.34 (0.1)</strong></td>
<td><strong>-0.003</strong></td>
<td><strong>0.002</strong></td>
<td><strong>[-0.52, -0.16]</strong></td>
</tr>
</tbody>
</table>

Notes: For Gender, 1 = male, 2 = female. Significance tests were two-tailed. * p < .05; ** p < .01; *** p < .001. Predictors whose p-values < .05 are bolded. Fat%=body fat percentage, Musc%=muscle percentage, Vint=performance on verbal intelligence task, PegTime=completion time of Peg Task, PegDif= between-hand difference in completion time of the Peg Task, pAttract = perceived attractiveness, pSocSkill= perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, SocEff=Social self-efficacy, GenEff=general self-efficacy, PhysEffppa= physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence.
Table 18. Final bootstrapped model of hierarchical multiple regression analysis of scores on the malicious envy subscale of the Benign and Malicious Envy Scale (n=106).

<table>
<thead>
<tr>
<th>Menvy</th>
<th>B (SE)</th>
<th>Bias</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: ( R^2_{adj} = 0; \Delta R^2 = 0.02 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.11 (0.11)</td>
<td>0.02</td>
<td>0.22</td>
<td>[-0.31, 0.21]</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.83 (1.58)</td>
<td>-0.05</td>
<td>0.59</td>
<td>[-3.86, 2.05]</td>
</tr>
<tr>
<td>Step 2: ( R^2_{adj} = 0.07; \Delta R^2 = 0.13 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>0.06 (0.07)</td>
<td>-0.008</td>
<td>0.41</td>
<td>[-0.09, 0.18]</td>
</tr>
<tr>
<td>Fat%</td>
<td>0.23 (0.09)</td>
<td>-0.01</td>
<td>0.02</td>
<td>[0.05, 0.38]</td>
</tr>
<tr>
<td>Musc%</td>
<td>0.17 (0.07)</td>
<td>0.01</td>
<td>0.01</td>
<td>[0.04, 0.34]</td>
</tr>
<tr>
<td>Grip</td>
<td>-0.03 (0.07)</td>
<td>-0.001</td>
<td>0.70</td>
<td>[-0.18, 0.12]</td>
</tr>
<tr>
<td>PegTime</td>
<td>-0.03 (0.11)</td>
<td>0.01</td>
<td>0.76</td>
<td>[-0.27, 0.22]</td>
</tr>
<tr>
<td>PegDif</td>
<td>0.19 (0.36)</td>
<td>0.01</td>
<td>0.62</td>
<td>[-0.47, 0.91]</td>
</tr>
<tr>
<td>Vint</td>
<td>-0.58 (0.31)</td>
<td>0.02</td>
<td>0.07</td>
<td>[-1.22, 0.09]</td>
</tr>
<tr>
<td>Step 3: ( R^2_{adj} = 0.08; \Delta R^2 = 0.06 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pAttract</td>
<td>1.76 (0.59)</td>
<td>0.05</td>
<td>0.01</td>
<td>[0.32, 3.17]</td>
</tr>
<tr>
<td>pSocSkill</td>
<td>-0.13 (0.65)</td>
<td>0.04</td>
<td>0.83</td>
<td>[-1.66, 1.24]</td>
</tr>
<tr>
<td>pAthlet</td>
<td>-0.30 (0.63)</td>
<td>-0.09</td>
<td>0.66</td>
<td>[-1.45, 0.68]</td>
</tr>
<tr>
<td>pEmotSkill</td>
<td>0.60 (0.64)</td>
<td>-0.05</td>
<td>0.34</td>
<td>[-0.48, 1.66]</td>
</tr>
<tr>
<td>pIQ</td>
<td>0.64 (0.65)</td>
<td>0.01</td>
<td>0.32</td>
<td>[-0.62, 1.81]</td>
</tr>
<tr>
<td>Step 4: ( R^2_{adj} = 0.30; \Delta R^2 = 0.21*** )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GenEff</td>
<td>-0.23 (0.1)</td>
<td>-0.003</td>
<td>0.02</td>
<td>[-0.42, -0.03]</td>
</tr>
<tr>
<td>SocEff</td>
<td>-0.02 (0.02)</td>
<td>0.00</td>
<td>0.29</td>
<td>[-0.07, 0.02]</td>
</tr>
<tr>
<td>PhysEffppa</td>
<td>0.04 (0.09)</td>
<td>0.01</td>
<td>0.64</td>
<td>[-0.15, 0.23]</td>
</tr>
<tr>
<td>PhysEffspc</td>
<td>-0.30 (0.07)</td>
<td>-0.003</td>
<td>0.001</td>
<td>[-0.41, -0.17]</td>
</tr>
</tbody>
</table>

Notes: For Gender, 1 = male, 2 = female. Significance tests were two-tailed. * \( p < .05 \); ** \( p < .01 \); *** \( p < .001 \). Predictors whose p-values < .05 are bolded. Fat% = body fat percentage, Musc% = muscle percentage, Vint = performance on verbal intelligence task, PegTime = completion time of Peg Task, PegDif = between hand difference in completion time of the Peg Task, pAttract = perceived attractiveness, pSocSkill = perceived social skills, pAthlet = perceived athletic ability, pEmotSkill = perceived emotional skill, pIQ = perceived intelligence, SocEff = Social self-efficacy, GenEff = general self-efficacy, PhysEffppa = physical self-efficacy scale – perceived athletic ability subscale, PhysEffspc = physical self-efficacy scale – self-presentation confidence.