Heintzelman Greed Scale© (HGS©)
Theoretical Framework and Item Development

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This project was supported by the Robert N. Heintzelman Eminent Scholar Endowed Chair Fund.

Introduction

Greed has become a salient topic of interest in both modern society and scientific literature. Since the economic crisis in 2008, the dialogue around greed dominates contemporary discourse as individuals often accuse greedy bankers, traders, and Wall Street moguls as the cause of financial crisis and downturn (Kirchgassner, 2014; Oka & Kuijt, 2014a). Commentaries on greed and the portrayal of greedy individuals are prevalent in popular culture with the production of motion pictures such as *The Wolf of Wall Street* (Scorsese & Scorsese, 2013) along with contemporary literature like *Buy the Fear, Sell the Greed* (Connors, 2018). Similarly, journalists are reporting on and analyzing the greedy behavior of well-known figures such as Bernie Madoff (e.g., Creswell & Thomas, 2009). However, greed is not isolated within popular culture and scholars are also researching, conceptualizing, and writing about greed in the wake of the recent financial crisis (e.g., Haynes, Campbell, & Hitt, 2017; Winarick, 2010). Although the topic of greed is relevant in today's society, a consistent definition of greed remains elusive as individuals conceptualize greed in various ways. After conducting a thorough literature review including both conceptual and empirical works on greed, we propose a definition of greed to include the desire to acquire more than individuals have or retain what individuals have at all costs. Greed involves a desire for things that individuals' value, including material or non-material things.

Psychologists have begun to explore greed as a dispositional motivation. As interest in understanding dispositional greed has increased, so has the need for measures of greed that follow instrument development best practices (e.g., American Educational Research Association [AERA], the American Psychological Association [APA], & the National Council on Measurement in Education [NCME, 2014]; DeVellis, 2017; Dimitrov, 2012; Haladyna & Rodriguez, 2013; Lambie, Blount, & Mullen, 2017) and test the factorial structure. To date, six different self-report instruments assessing greed are available, however, current measures are based on a narrow definition of greed. Therefore, the purpose of this project was to develop the *Heintzelman Greed Scale* (HGS), employing instrument construction best practices in order to examine psychometric features of the HGS scores with diverse samples of individuals. The HGS is the first multidimensional scale based on a broader definition of dispositional greed.

The development of an assessment to measure levels of greed that more accurately aligns with the conceptual definition of dispositional greed, may aid in increasing our understanding of individual differences in greed and greed development. A psychometrically sound assessment to measure greed may in turn lay a foundation for applied research related to strategies that might be able to affect the development of greed in individuals.

Dispositional Greed

Although rhetoric around greed has become common discourse, greed is a complex construct that is subjectively vague and culturally specific (Jin & Zhou, 2013; Oka & Kuijt, 2014b). Individuals have their own views on what they consider is or is not greedy behavior; philosophical, religious, or cultural values shape individuals' subjective views of greed. Oka and Kuijt (2014b) noted that greed is rooted in local, cultural, societal, and temporal realities. "The same behaviors considered greedy and excessive here and now might be considered beneficial accumulation in another time and place" (Oka & Kuijt, 2014a, p. 6). Thus, the discussion of greed is often subjective and complex even with increasing attention to the construct, and there is a lack of definitional clarity regarding the construct of greed.

Defining Greed

In the field of psychology, limited attention is on greed and only recently have researchers begun to take a psychological approach to studying greed. Much of the psychological focus on greed has been conceptual in nature or discussed in post hoc analysis (Chen, 2018; Seuntjens et al., 2015b). Greed is a topic that is challenging to define (Wang et al., 2011), and there is no single or consistent definition across the literature. Different conceptualizations and limited research makes it difficult to

examine the construct and interpret results. However, the majority of scholars agree that greed includes a longing or desire to obtain more, with a defining feature of greed as the desire to acquire more (Mussel & Hewig, 2016). Specifically, many scholars argue that greed is not simply a desire but an *excessive* desire or striving (Balot, 2001; Mussel et al., 2015; Wang et al., 2011; Wang & Murnighan, 2009). Although the majority of scholars agree that greed includes a longing for more, greed remains a topic that is conceptualized in various ways. In what follows we outline some of the discrepancies among conceptualizations of greed, and argue for central features that should be included in future definitions.

A desire for more than money or wealth. One of the major discrepancies in defining greed lies within the boundaries of the concept. Greed is sometimes narrowly defined as the desire for money or materials (e.g., Bruhn & Lowrey, 2012; Cottey, 2013; Haynes et al., 2015; Jin & Zhou, 2013), while other times this definition is broadened to include non-material goods beyond wealth (e.g., Levine, 2000; Mussel & Hewig, 2016). Other objects of desire can include anything that one deems of value (Levine, 2000), including power, status, sex, success, privilege, friends, or time (Krekels & Pandelaere, 2015; Levine, 2000; Slatter, 2014; Winarick, 2010). In a prototype analysis aiming to develop a grounded definition of greed, researchers asked their participants (N = 195) to list examples of greed (Seuntjens et al., 2015a). Although the majority of participants listed items related to materialism or money, others listed lust, gluttony, and power as features of greed, supporting that greed encompasses more than just riches or wealth and might include a desire for sex, privilege, or control. Thus, both conceptualization and initial research examining greed support expanding the boundaries of greed beyond just money to include a desire for things that people value, which may or may not include money or wealth. Since individuals vary in what they value, it follows that their objects of desire may diverge resulting in individuals' being greedy for different things.

Insatiability. The definition of greed as the excessive desire for something (material or non-material) also includes the quality of individuals' inability to be satisfied. Therefore, individuals' insatiability to acquire something (material or non-material) is another element of greed that is often common across definitions (i.e., Krekels & Pandelaere, 2015; Levine, 2000; Seuntjens et al., 2015a; Tripathi & Singh, 2017). For individuals with high levels of greed, they continue reaching for an ever-elusive target that remains unattainable. Seuntjens and colleagues (2015a) provided initial empirical support for including insatiability as a component of greed. Using a prototype analysis, they created a definition of greed based on data from participants in the Netherlands and United States. They conducted a series of five different studies by first asking participants to identify features related to greed, then determined the relative significance of these features as central or peripheral, and developed a working hypothesis of a psychological definition of greed. As a result, they outlined greed as, "the experience of desiring to acquire more and the dissatisfaction of never having enough" (p. 518). Thus, Seuntjens and colleagues' (2015a) conceptualized greed to include not only the desire of something, but also the reciprocal experience of being unsatisfied.

An excessive desire at all costs. In addition to an insatiable drive for more, greed also encapsulates a desire to obtain or retain something at all costs regardless of the consequences. Desiring something to the extent that one wants things (material or non-material) to the extreme extent that they are never satisfied can lead to elevating that desire above all else. Mussel and Hewig (2016) described that greedy behavior goes beyond accumulation of resources, and should be characterized by acquisitiveness to the level that imposes negative consequences on others, albeit an individual, group, organization, or society. Similarly, a number of scholars include a lack of concern for others in their definitions of greed (i.e., Gregoire, Laufer, & Tripp, 2010; Haynes et al., 2015; Vaselka, Giammarco, & Vernon, 2014) as accumulation of what one wants takes precedence over everything else (Winarick, 2010). Therefore, greed includes longing for something regardless of the consequences that may include imposing negative results on others or doing things perceived as unacceptable by others (Mussel & Hewig, 2016; Wang et al., 2011).

Both retention and acquisition motives. Lastly, greed includes a motivation to both retain and/or acquire the object of value (material or non-material). Some definitions of greed include procuring, acquiring, or gaining things, whereas other times greed is conceptualized as holding on to

things at all costs. Seuntjens (2016) argues that both retention and acquisition are components of greed, although she posits that acquisition is more central; however, research results are mixed. For example, Seuntjens and colleagues (2015b) found that individuals with high levels of greed spend more and save less as measured on the *Tight-wads Spend-thrifts Scale* (Rick, Cryder, & Loewenstein, 2008). In addition, Seuntjens, Van de Ven, Zeelenberg, and Van der Schors (2016) found that dispositional greed was associated with saving less and spending more in a sample of adolescents. In contrast, Krekels (2015) supports greed as a retention motivation, identifying a correlation between greed and increased levels of loss aversion, where individuals wanted to keep what they have. Thus, more research is needed to understand the construct of greed, yet, from a conceptual viewpoint, greed can encapsulate both retention and acquisition motivations.

In summary, although definitions of greed are inconsistent, new research findings support specific qualities of the construct of greed that should be included in future definitions. Specifically, greed is an excessive desire that encompasses (a) a desire for anything that one values, which is not limited to money, wealth, or material items; (b) the inability to be satisfied or feeling as if one never has enough; (c) a disregard for the potential cost of obtaining one's desire; and (d) both acquisition and retention motivations. Therefore, we propose a working definition of greed that includes the desire to acquire more than one has or retain what one has at all costs, and the discontentment of never having enough, including a desire for things that one values consisting of material things (e.g., money, wealth, clothes, technology) or non-material things (e.g., time, acceptance, sex, power).

Related but Distinct Constructs to Greed

In order to maintain definitional clarity, it is important to delineate other constructs that are similar to greed, but distinct concepts. Given the lack of consistency in the conceptualization of greed across the literature, greed is mistakenly confounded or used interchangeably with related concepts (Seuntjens, 2016). Specifically, greed may be confounded with materialism, envy, self-interest, and acquisitiveness.

Materialism. Materialism is often associated with greed; however, the two are distinct constructs. Materialism relates to the focus on acquisition above what is necessary *and* displaying one's wealth and acquired goods (Krekels & Pandelaere, 2015; Mussel & Hewig, 2016). Similarly, materialistic tendencies can be satisfied once individuals acquire the resource or luxury items (Mussel & Hewig, 2016), whereas greedy tendencies cannot be satiated. In addition, as noted, greed is a broader concept that includes nonmaterialist things (i.e., power, affirmation, success), whereas materialism is solely focused on material goods (Seuntjens et al., 2015b). Through confirmatory factor analysis (CFA) as part of establishing evidence of construct validity for their *Dispositional Greed Scale* (DGS_b) Seuntjens and colleagues (2015b) substantiated that greed in fact was a distinct construct from materialism, although correlations ranged between .56 and .72 ($p < .001$) across four samples.

Self-Interest. Similar to materialism, self-interest relates to greed, but is distinct. In an attempt to provide clarity on the differentiation between self-interest and greed, Wang and colleagues (2011) described self-interest as a desire to maximize or obtain material gains and noted that self-interest focuses on enhancing one's own well-being, whereas greed is self-interest taken to an extreme, imposing a "no stopping rule" and influencing others in a negative way (p. 645). In other words, greed includes a focus on individuals' desire *above all else*. Thus, although they may occur on a continuum, there is a *tipping point* when self-interest to the extreme can turn into greed (Haynes et al., 2015). Similar to materialism, initial data supports the separation of greed and self-interest as unique constructs. Through exploring the discriminate validity of their DGS_b scores, Seuntjens and colleagues (2015b) used CFA to corroborate that greed is a separate construct from self-interest, with significant (albeit low) correlations between .17 to .21 ($p < .01$) across two samples.

Acquisitiveness. Acquisitiveness is another similar, but distinct construct from greed, relating to obtaining material things. As noted, greed encompasses a desire to obtain more than material objects and is thus a broader concept. Although greed may manifest in a form of acquisitiveness (Levine, 2000), acquisitiveness does not always equate to greed. However, acquisitive motivations can play an important role in the manifestation of dispositional greed. As Krekels and Pandelaere (2015) note, although acquisitiveness can provide evidence of greedy behavior, other motivational constructs

could also explain acquisitiveness such as fear. Thus, although acquisitiveness might be one indicator of greed, it is not always indicative of a greedy motivation. Thus, greed and acquisitiveness are conceptualized as distinct constructs.

Envy. Envy is another construct that relates to greed but is distinct. Although envy can be suggestive of greed, it implies an aggressive outward attitude towards others, while greed motivates individuals to focus on their own insatiable focus (Maijala, Munnukka, & Nikkonenen, 2000). In other words, envy can be a catalyst of greed, but individuals with high levels of greed concentrate on themselves and focus inward as opposed to comparing themselves with others (Mussel & Hewig, 2016; Seuntjens et al., 2015b; Winarick, 2010). Although both motivations are often unsatisfied with their current situation, envy compares with others and greed focuses on an imaginary state of having more of what they desire (Seuntjens, 2015b). Empirically, Seuntjens and colleagues (2015b) established the distinction between envy and greed through investigating evidence of discriminate and construct validity of DGS_b scores. Through CFA, the researchers found envy to be a distinct construct of greed, but with a significant correlation ($r = .33$, $p < .01$; $r = .34$, $p < .001$) across two samples respectively. Thus, although greed and envy relate and one can be both envious and greedy, it is important to delineate these two constructs.

Miserliness. As we consider the inclusion of a retention motivation in the definition of greed, it is also important to differentiate greed with miserliness. Often miserliness is associated with individuals who are stingy or hold on to money. However, in contrast to a greedy retention motivation, miserliness can be reflective of conscientiousness (Hur, Jeong, Aiken Schermer, & Rushton, 2011). For example, Hur and colleagues (2011) identified significant correlations between conscientiousness and miserliness ($N = 1{,}935$) in both males ($r = .29$) and females ($r = .30$), and argued that individuals who are miserly may be cost-effective and intentional about managing money. Misers might hold on to money for many reasons including conscientiousness, financial need, or past experiences with money. Thus, adopting a miserly approach towards money may be distinct from a greedy motivation. Although miserliness and greedy retentions of resources may appear similar, they are distinct concepts; one can be both miserly and greedy, but it is important to recognize that miserliness can exist separately from greed.

Greed as a Dispositional Trait

As we develop a comprehensive definition of greed and delineate greed from related constructs, it is important to clarify the psychological underpinning of greed as an emotion (state) or motivational disposition (trait). Emotions are temporary, situation specific, and acute, distinguishing them from motivational personality traits that are enduring (Seuntjens, 2016). Traditionally, scholars viewed greed as more of a state as compared to a trait, where the activation of greed may occur or not occur in certain situations. The majority of psychological research investigating greed examines the construct from a situational state perspective, manipulating scenarios in social dilemma games (e.g., dictator game, public goods dilemma) in order to explore individuals' greedy behaviors in specific circumstances (e.g., Bruins, Liebrand, & Wilke, 1989; Cozzolino, Sheldon, Schachtman, & Meyers, 2009; Cozzolino, Staples, Meyers, & Samboceti, 2004; Eek & Biel, 2003). Specifically, researchers often explore the motives behind individual versus collective oriented actions, where self-interested motives (identified as greed) relate to 'defection', and group oriented actions relate to 'cooperation' (Wang et al., 2011). These behavioral studies identify that (a) cooperation can be motivated by both fear and greed (Bruins et al., 1989; Yamagishi & Sato, 1986), (b) greedy behaviors reduces cooperation with others (Eek & Biel, 2003), and (c) greed can enhance competitive behavior (Steinel & De Dreu, 2004). Assessment of greed in these situations are measured by behavioral indicators, such as how much money one kept for themselves or if they defected rather than cooperated with others due to monetary incentives. However, researchers in these studies assess individuals' greedy behavior as observed in specific situations (social dilemma games). In these scenarios, individuals have the opportunity to enhance their own outcomes, making it difficult to distinguish greed from related constructs such as self-interest (Seuntjens, 2016). Additionally, research examines situations that may engender individuals' greedy behavior, focusing on greed as an emotional state, failing to value that greedy behavior is often the result of both situation (greed as an emotion) and personality

(greed as a trait), limiting our understanding of why people differ in their levels of greedy behavior in certain situations (Krekels & Pandelaere, 2015).

Theoretically, greed can be both an emotional state as well as a motivational trait. Mussel and colleagues (2015) proposed that "greed is a stable personality trait [that can be] activated by situational characteristics" (p. 127). Thus, greed can be a hybrid of both an emotional state and a motivational personality trait; however, researchers often focus on manifestations of state greed in certain situations and research is limited on the dispositional nature of greed. Considering the theoretical difference between greed as a state or a dispositional trait, psychologists began to focus on greed as a stable motivational disposition subject to individual differences.

Initial evidence supports the aspects of greed as a stable trait over time. Specifically, in order to assess the reliability of Krekels and Pandelaere's (2015) *Dispositional Greed Scale* (DGS_a), the researchers initially asked participants to complete the DGS_a and then asked them to take the DGS_a again three weeks later. The participants' DGS_a scores between the two points were highly correlated ($r = .83$, $p < .001$) and researchers concluded that initial evidence supports greed as a stable disposition. Psychological researchers have just begun to explore the dispositional nature of greed, representing an important gap in the literature. Given the extant research on greed as a disposition, we need to learn more about greed as a personality trait and stable motivation. Therefore, we focus on the dispositional nature of greed as a personality trait.

Research on Dispositional Greed

As noted, the majority of research on greed examines greed from a situational state perspective, manipulating scenarios in social dilemma games in order to identify greedy behaviors. It is only within the last several years that psychologists have examined greed as a stable disposition and explored individual differences in greed using various dispositional greed assessments. Researchers have found initial support for individual variance in greed. For example, in a sample of North American adults, Krekels and Pandelaere (2015) found that men score at higher levels of greed than women, individuals working in financial and management sectors score higher than those working in the arts, and individuals scoring higher in greed often feel more envious and entitled. In addition, Mussel and colleagues (2015) found that individuals with high traits of greed took greater risks in order to maximize their outcomes. Researchers have also connected dispositional greed and psychopathy. Aspects of sub-clinical psychopathy include lack of empathy and greed (see Wilson & McCarthy, 2011). Mussel and Hewig (2016) found a correlation between greed and a sub-dimension of psychopathy (meanness), and Seuntjens and colleagues (2015b) and Vaselka and colleagues (2014) found correlations with dispositional greed and instruments measuring psychopathy. As a result, Vaselka and colleagues (2014) viewed greed, among other constructs, as a type of subclinical antisocial personality trait.

Seuntjens and colleagues (2015b) explored greed in relation to 24 measures of divergent constructs. As a result, they found correlations of dispositional greed with maximization, self-interest, envy, and materialism among a sample of Dutch and American participants. In addition, dispositional greed was associated with impulsivity, spending more, decreased well-being, lower self-esteem, and less concern for others. Overall, Seuntjens and colleagues found that dispositional greed is higher in younger people, those with lower education, and males. Interestingly, there was no significant correlation between greed and social comparison among the Dutch participants; however, there was a significant correlation among their sample of US participants. Therefore, greed may be a construct relating to individuals' culture.

Although limited, researchers are also beginning to explore dispositional greed at different developmental periods. Specifically, Seuntjens and colleagues (2016) explored greed in relation to the financial behavior of adolescents and associated greed with certain financial behaviors in youth including spending more money and saving money less often. Additionally, dispositional greed was related to having a higher income but alternatively, having more debt. Thus, scholars are just beginning to explore dispositional greed across ages and subpopulations.

Current Greed Measures

As interest in understanding dispositional greed has increased, so has the need for the development of psychometrically sound instruments to measure greed. To date, six different self-report instruments assessing greed are available: (a) *The Greed Scale* (Yamagishi & Sato, 1986); (b) *The Greed Trait Measure* (Mussel et al., 2015), (c) the *Vices and Virtues Scales*, which includes Greed as a subscale (VAVS; Veselka et al., 2014); (d) the *Dispositional Greed Scale*$_a$ (DGS$_a$; Krekels & Pandelaere, 2015); (e) the *Dispositional Greed Scale*$_b$ (DGS$_b$; Seuntjens et al., 2015b), and (f) the *GR€€D scale*, a longer version of the *Greed Trait Measure* (Mussel & Hewig, 2016). Interestingly, the development of five of the greed scales occurred in the past four years, denoting the relevance of this contemporary topic (Seuntjens, 2016). Despite the development of six different self-report instruments assessing greed, existing measures align with a narrow definition of greed. More specifically, none of the current measures include a focus on more than material things (i.e., non-material things such as power, love, and affirmation) and no existing measure incorporates a retention motivation. Thus, there is a need for the development of a greed assessment that examines individual differences in both acquisition and retention of goods, material and non-material, in order to enhance our understanding of the nature of dispositional greed and how it may vary across individuals.

As a result, we (Lambie & Stickl, 2019) developed the *Heintzelman Greed Scale* (HGS) based on theory, the extant literature, and instrument development best practices (e.g., American Educational Research Association [AERA], the American Psychological Association [APA], & the National Council on Measurement in Education [NCME, 2014]; DeVellis, 2017; Dimitrov, 2012; Haladyna & Rodriguez, 2013; Lambie, Blount, & Mullen, 2017). Upon a through literature review of dispositional greed, we defined greed as the desire to acquire more than one has or retain what one has at all costs and the tendency to never be satisfied. Greed includes an individual's desire for more, including material things (e.g., money, wealth) or non-material things (e.g., success, power). Thus, we identified six aspects of greed, including: (a) excessive desire for more, material things; (b) excessive desire for more, non-material things; (c) disregard for the potential cost of obtaining one's desire; (d) insatiability; (e) acquisition motivation; and (f) retention motivation.

Item Development & Theoretical Framework

The *Heintzelman Greed Scale*© (HGS©) is designed to measure an individual's levels of dispositional greed. For the HGS, greed is the desire to acquire more than one has or retain what one has at all costs and the tendency to never be satisfied. Greed includes an individual's desire for more material goods (e.g., money, wealth) or non-material things (e.g., success, power). The primary areas measured by the HGS include individuals' levels of: (a) excessive desire for more, material things and goods; (b) excessive desire for more, non-material things; (c) disregard for the potential cost of obtaining one's desire; (d) insatiability; (e) acquisition motivation; and (f) retention motivation. Higher scores reflect behaviors or beliefs related to stronger levels of greed.

Using the 5-point Likert scale provided below, please indicate the degree to which you agree or disagree with each statement about yourself within the last month.

- Strongly Disagree: You disagree with this statement in most situations.
- Moderately Disagree: You disagree with this statement in some situations.
- Neither Agree nor Disagree: You do not agree or disagree with this statement.
- Moderately Agree: You agree with this statement in some situations.
- Strongly Agree: You disagree with this statement in most situations.

Strongly Disagree 1	Moderately Disagree 2	Neither Agree nor Disagree 3	Moderately Agree 4	Strongly Agree 5

Theoretical Domain #1: Excessive Desire for More: Material Things (11-items)

1. **Excessive Desire for More: Material Things:** Individuals' craving for more material or physical goods and resources such as money, wealth, clothing, books, etc. (e.g., Mussel & Hewig, 2016; Seuntjens, 2016).
   - **A.** Individuals' desires are focused on material goods and resources such as money, wealth, clothing, books etc. (e.g., Mussel & Hewig, 2016; Musselet al., 2015; Wang & Murninghan, 2009).
   - **B.** Individual relishes possessing high quantities of material goods (e.g., Mussel & Hewig, 2016; Mussel et al., 2015; Seuntjens et al., 2015a).
   - **C.** Individual desires expensive or high quality things (e.g., Seutnjens et al., 2015a; Vaselka et al., 2014).
   - **D.** Individuals are focused on enhancing their financial position and accumulating a lot of money and wealth (e.g., Mussel & Hewig, 2016; Vaselka et al., 2014).

HGS #1: Excessive Desire for More: Material Things	Rating				
1. I have a strong desire for material goods. (**1A**)	1	2	3	4	5
2. I take pleasure in owning high-priced things. (**1B**)	1	2	3	4	5
3. I want things that cost more than I can really afford. (**1C**)	1	2	3	4	5
4. One of my biggest drives is to have more money. (**1D**)	1	2	3	4	5
5. All I want is to have more wealth. (**1A**)	1	2	3	4	5
6. It is important to me to have a lot of expensive things. (**1B**)	1	2	3	4	5
7. A good motto for me is "The more expensive, the better". (**1C**)	1	2	3	4	5
8. My focus in life is to become extremely wealthy. (**1D**)	1	2	3	4	5
9. I crave having more material things. (**1A**)	1	2	3	4	5
10. There is no such thing as too much wealth. (**1B**)	1	2	3	4	5
11. I will do everything I can to be a wealthy person. (**1D**)	1	2	3	4	5

Theoretical Domain #2: Excessive Desire for More: Non-Material Things (12-items)

2. **Excessive Desire for More: Non-Material Things:** Individuals' craving for more non-material things such as sex, affirmation, status, power, and success (e.g., Krekels & Pandelaere, 2015; Mussel & Hewig, 2016; Suentjens, 2016; Seuntjens et al., 2015a).
   - **A.** Individuals' desires are focused on non-material goods and resources such as sex, status, affirmation, power, love, or success (Krekels & Pandelaere, 2015; Seuntjens, 2016; Seuntjens et al., 2015a).
   - **B.** Individuals' goals in life are focused on their desire to enhance or increase non-material things (e.g., Krekels & Pandelaere, 2015).
   - **C.** Individual strives for better and desires to improve oneself (e.g., Krekels & Pandelaere, 2015; Seuntjens et al., 2015a).

HGS #2: Excessive Desire for More: Non-Material Things	Rating				
1. I crave love from others. (2A)	1	2	3	4	5
2. I want more control over others. (2B)	1	2	3	4	5
3. I want to get better at everything I do. (**2C**)	1	2	3	4	5
4. I want to be popular. (**2A**)	1	2	3	4	5
5. I hunger for power. (**2B**)	1	2	3	4	5
6. I am constantly working on improving myself. (**2C**)	1	2	3	4	5
7. I often crave affirmation from others. (**2A**)	1	2	3	4	5
8. My efforts are focused on increasing my popularity. (**2B**)	1	2	3	4	5
9. I want to be better at my job than those around me. (**2C**)	1	2	3	4	5
10. I yearn for success in everything I do. (**2A**)	1	2	3	4	5
11. It's really important that other people like me. (**2B**)	1	2	3	4	5
12. I make every effort to better myself. (**2C**)	1	2	3	4	5

Theoretical Domain #3: Disregard for the Potential Cost of Obtaining One's Desire (12-items)

3. **Disregard for the Potential Cost of Obtaining One's Desire:** Individuals' pursuit to obtain their desire above all else and without regard to the cost (e.g., Mussel & Hewig, 2016; Vaselka et al., 2014; Wang et al., 2011).
   - **A.** Individuals have 'tunnel vision' and excessively pursues their objects of desire without concern for any consequences on another person, group, organization, or broader society (e.g., Mussel & Hewig, 2016; Mussel et al., 2015; Seuntjens, 2015a; Vaselka et al., 2014).
   - **B.** Individuals pursue their object of desire without concern for any potential detrimental consequences on themselves or their own long-term interests (e.g., Seuntjens et al., 2015a).
   - **C.** Individual is willing to manipulate or betray others in order to obtain the objects of desire (e.g., Seuntjens et al., 2015a; Vaselka et al., 2014).
   - **D.** Individual is willing to engage in immoral or unethical behavior to obtain the objects of their desire (Krekels, Pandelaere, Weijters, 2012; Mussel et al., 2015; Seuntjens et al., 2015a; Wang et al., 2011)

HGS #3: Disregard for the Potential Cost of Obtaining One's Desire	Rating				
1. I do whatever it takes to get the things that I want. (**3A**)	1	2	3	4	5
2. I don't think about consequences when pursuing what I desire. (**3B**)	1	2	3	4	5
3. I use people to help me get what I want. (**3C**)	1	2	3	4	5
4. I would cheat in order to get what I desire. (**3D**)	1	2	3	4	5
5. I value getting what I want above everything else (**3A**)	1	2	3	4	5
6. I chase the things that I want, even when it hurts me in the long-run. (**3B**)	1	2	3	4	5
7. It is more important to me to get what I want than to have friends. (**3C**)	1	2	3	4	5
8. I will get what I want at all costs, even if I have to lie. (**3D**)	1	2	3	4	5
9. It is ok to harm others to get what I want. (**3A**)	1	2	3	4	5

10. I am so focused on getting what I want, that I don't think about the consequences. (**3B**)	1	2	3	4	5
11. It is ok to manipulate people to get what I want. (**3C**)	1	2	3	4	5
12. I accept that I might have to do bad things in order to get the things that I want. (**3D)**	1	2	3	4	5

Theoretical Domain #4: Insatiability (12-items)

4. **Insatiability:** Individuals' inability to be satisfied; no amount of a desired good is ever enough (e.g., Krekels & Pandelaere, 2015; Seuntjens et al., 2015a).

   A. No matter how much individuals have, they can never have too much (e.g., Krekels & Pandelaere, 2015; Seuntjens, et al., 2015a).
   B. Individuals always want more than what they have (e.g., Krekels & Pandelaere, 2015; Mussel & Hewig, 2016; Seuntjens et al., 2015b; Vaselka et al., 2014).
   C. Individuals are never satisfied with what they currently have (e.g., Krekels & Pandelaere, 2015; Suentjens et al., 2015b; Suentjens et al., 2015a).
   D. Individuals are not grateful for what they already have (e.g., Seuntjens, 2016).

HGS #4: Insatiability	**Rating**				
1. It is impossible to have too much of the things that I want. (**4A**)	1	2	3	4	5
2. I want more than what I already have. (**4B**)	1	2	3	4	5
3. I am often unsatisfied with what I have. (**4C**)	1	2	3	4	5
4. It is hard to be grateful for what I have. (**4D**)	1	2	3	4	5
5. When I think about what I have, it is never enough. (**4A**)	1	2	3	4	5
6. I can't imagine having enough of what I want to satisfy me. (**4B**)	1	2	3	4	5
7. I am not happy with what I have. (**4C**)	1	2	3	4	5
8. I don't often appreciate what I have. (**4D**)	1	2	3	4	5
9. As much as I have, I can never have too much. (**4A**)	1	2	3	4	5
10. I long for more than what I have. (**4B**)	1	2	3	4	5
11. I am not content with what I have. (**4C**)	1	2	3	4	5
12. I'm not thankful for what I have. (**4D**)	1	2	3	4	5

Theoretical Domain #5: Acquisition Motivation (8-items)

5. **Acquisition Motivation:** The motivation to acquire and attain more (e.g., Krekels, 2015; Suentjens, 2016).

   A. Individuals seek to attain as much as possible of a resource that they value (e.g., Seuntjens, 2016).
   B. Individuals seek to acquire or possess more than what they already have (e.g., Krekels, 2015; Krekels & Pandelaere, 2015; Seuntjens, 2016; Seuntjens et al., 2015a).

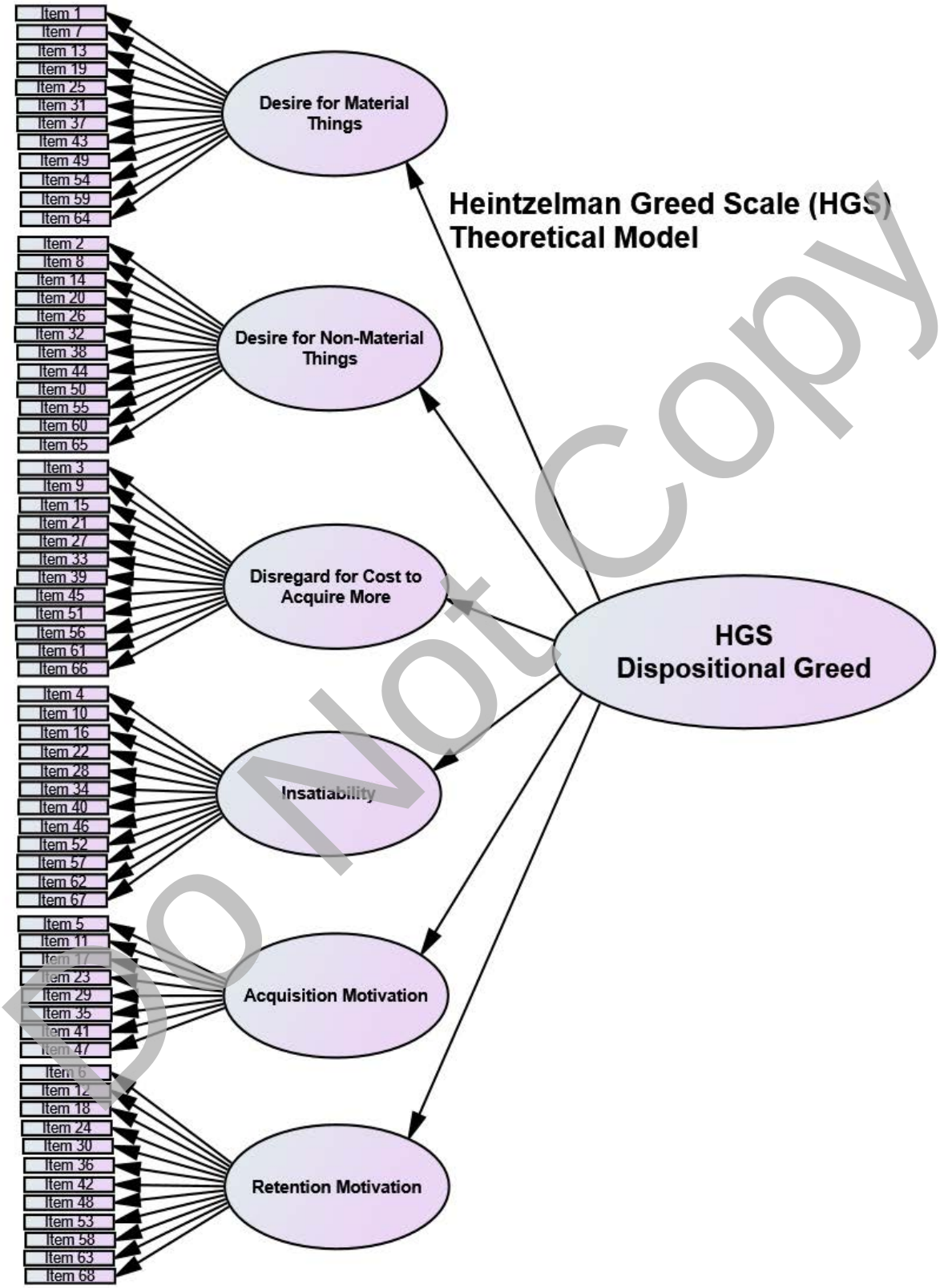
HGS #5: Acquisition Motivation	Rating				
1. I take great pleasure in buying new things. (**5A**)	1	2	3	4	5
2. I want to acquire more and more. (**5B**)	1	2	3	4	5
3. My ambition is to get as much as possible of the things that I want. (**5A**)	1	2	3	4	5
4. When I think about what I have, I want more. (**5B**)	1	2	3	4	5
5. I try to get as much as I can of things that I desire. (**5A**)	1	2	3	4	5
6. I will do anything I can to acquire more of the things that I want. (**5B**)	1	2	3	4	5
7. I seek to gain as much as possible. (**5A**)	1	2	3	4	5
8. My goal is to acquire more than what I already have. (**5B**)	1	2	3	4	5

Theoretical Domain #6: Retention Motivation (12-items)

6. **Retention Motivation:** Individuals' motivation to keep and hold on to what they already have (e.g., Krekels, 2015; Seuntjens, 2016).

   A. Individuals strive to keep everything that they already have (e.g., Krekels, 2015; Seuntjens, 2016).
   B. Individuals are stingy or unwilling to share what they have with others (Seuntjens et al., 2015a; Vaselka et al., 2014).
   C. Individuals fear losing what they already have (Krekels, 2015; Seuntjens, 2016).

HGS #6: Retention Motivation	Rating				
1. I will do anything to keep what I have. (**6A**)	1	2	3	4	5
2. It is not my responsibility to give to others. (**6B**)	1	2	3	4	5
3. I worry about losing what I have. (**6C**)	1	2	3	4	5
4. Maintaining what I have is important to me. (**6A**)	1	2	3	4	5
5. I am stingy with what I have. (**6B**)	1	2	3	4	5
6. I am afraid that everything I have might be gone one day. (**6C**)	1	2	3	4	5
7. I do everything I can to hold on to what I own. (**6A**)	1	2	3	4	5
8. I don't like sharing what I have. (**6B**)	1	2	3	4	5
9. I am fearful that I might lose everything I have. (**6C**)	1	2	3	4	5
10. It is vital for me to hold on to what I have. (**6A**)	1	2	3	4	5
11. I don't like to share with others. (**6B**)	1	2	3	4	5
12. I am concerned that I will lose what I have. (**6C**)	1	2	3	4	5


Heintzelman Greed Scale (HGS)
Theoretical Model
Desire for Material Things
Desire for Non-Material Things
Disregard for Cost to Acquire More
Insatiability
Acquisition Motivation
Retention Motivation
HGS
Dispositional Greed
Item 1
Item 7
Item 13
Item 19
Item 25
Item 31
Item 37
Item 43
Item 49
Item 54
Item 59
Item 64
Item 2
Item 8
Item 14
Item 20
Item 26
Item 32
Item 38
Item 44
Item 50
Item 55
Item 60
Item 65
Item 3
Item 9
Item 15
Item 21
Item 27
Item 33
Item 39
Item 45
Item 51
Item 56
Item 61
Item 66
Item 4
Item 10
Item 16
Item 22
Item 28
Item 34
Item 40
Item 46
Item 52
Item 57
Item 62
Item 67
Item 5
Item 11
Item 23
Item 29
Item 35
Item 41
Item 47
Item 6
Item 12
Item 18
Item 24
Item 30
Item 36
Item 42
Item 48
Item 53
Item 58
Item 63
Item 68

Steps in the Development of the HGS

The steps in developing psychological assessments vary (e.g., AERA, APA, & NCME, 2014; Crocker & Algina, 2006; DeVellis, 2017; Dimitrov, 2012; Lambie et al., 2017). For the development of the HGS, a combination of the instrument development step-wise processes were followed, including

(a) Determine clearly what is being measured
(b) Set psychological assessment specifications and structural framework
(c) Create an item pool
(d) Determine the type for measurement
(e) Have initial item pool reviewed by experts
(f) Consider the inclusion of validation items
(g) Administer items to a development sample (e.g., pilot data)
(h) Evaluate pool of items
(i) Administer items to a training sample (e.g., exploratory factor analysis)
(j) Evaluate pool of items
(k) Optimize scale length
(l) Administer items to a validating sample (e.g., confirmatory factor analysis)
(m) Evaluate pool of items
(n) Optimizing scale length.

Step 1: Defining the Construct Measured by a Psychological Assessment

An initial step in establishing content-oriented evidence for the HGS was to provide a definition of dispositional greed and the six primary areas measured by the HGS include individuals' levels of: v. In line with Wolfe and Smith's (2007) recommendation, we needed to "define the purpose of measurement so that the validity of the measures for the intended purpose can be adequately evaluated" (p. 101). As a result, we developed a clear definition of dispositional greed that was grounded in supporting literature, previous measures, research, and theory. In addition, we created the current assessment training manual in order to provide an overview of our process as established by instrument development best practices (e.g., AERA, APA, & NCME, 2014; DeVellis, 2017; Dimitrov, 2012; Haladyna & Rodriguez, 2013; Lambie et al., 2017) and delineate clear definitions of the construct, items, domains, and construct of greed. In the initial development of the HGS, we sought to develop more items than might be necessary because of the importance to provide a thorough representation of the construct of greed, keeping in mind that item redundancy in the initial stages is acceptable (DeVellis, 2017). However, our HGS item list was narrowed through the processes of using expert reviewers as well as item reduction after initial factor analysis, reducing redundancy in the final instrument.

Step 2: Set Psychological Assessment Specifications and Structural Framework

The next step in establishing content-oriented evidence for the HGS was to establish the domains to be measured within a guiding theoretical framework. This framework sets up the assessment specifications that delineates the type and content of items that are included in the HGS along with how each item corresponds with the domains of dispositional greed. Using theory to inform instrument development is an important part of delineating the content of a measure (Wolfe & Smith, 2007). As we developed our HGS items, we matched our item list to the objectives and theoretical factors, giving our expert reviewers a template of how each HGS item aligned with the theorized factor structure. As a result, our expert reviewers were able to evaluate if the HGS items accurately represented the construct of greed.

Step 3: Create an Item Pool

The development of the instrument's items is an essential part of constructing an adequate and efficacious assessment instrument. With this in mind, we followed Kline's (2005) nine

recommendations guiding the development of appropriate scale items: (a) deal with only one central thought in each item, (b) be precise, (c) be brief, (d) avoid awkward wording or dangling constructs, (e) avoid irrelevant information, (f) present items in positive language, (g) avoid double negatives, (h) avoid terms like "all" or "none", and (i) avoid indeterminate terms like "frequently" or "sometimes" (pp. 34-35). We began our item development by examining our theorized factor structure as well as evaluating other greed assessments and their items. Our evaluation of other assessment items was guided by several considerations including: (a) clarity of the item (b) ease of reading the item (c) other ways this item might be asked, and (d) what the item is measuring. As we considered these guidelines, we developed our own items and ensured that each item was simple, concise, and written at an appropriate reading level.

Step 4: Have Initial Item Pool Reviewed by Experts

In order to establish content-oriented evidence for the HGS items, we selected qualified experts to review the content of the initial item pool. Specifically, we asked expert reviewers to explore the relevance of items to the intended construct and theorized domain (DeVellis, 2017). We provided each reviewer with a brief literature review, clear description of the items, and outline of each content domain. We provided each reviewer with instructions to review the item pool and provide feedback in regards to the clarity of items, the item format, and the item's fit and relevance on the identified domain. As a result of the review process, we received sound feedback related to the HGS and our conceptualized construct (Dimitrov, 2012). In line with best practices, we documented our expert reviewers' qualifications, demographic characteristics, and area of expertise or experience (AERA et al., 2014).

Our expert review panel included 13 scholar researchers, exceeding best practice recommendations identified in instrument development literature (e.g., DeVellis, 2017, Dimitrov, 2012). The majority of reviewers were Male (n = 8) as compared to female (n = 5). Expert reviewers represented 13 different universities and two countries (including the United States and Germany). Reviewers were selected based on their areas of expertise in scholarship and research. Specifically, the review panel included experts in instrument development best practices as well as the construct of greed.

The feedback process was implemented in two phases. After obtaining initial feedback from four reviewers, changes were made to the items and scale according to initial suggested revisions. Subsequently, in order to obtain additional feedback on the adjusted scale and items, we sent out the scale to the remaining reviewers in Phase two. Across both phases, we integrated the expert reviewers' feedback into the HGS item pool to increase content-oriented evidence. Overall, adjustments included neutralizing items by removing words such as "always", "frequently", and "constantly", adjusting items to increase accessibility for divers populations, and re-wording items to enhance clarity (e.g., using the word "keep" instead of "retain"). The expert review process resulted in a 67-item, six factor HGS.

Step 5: Administer Items to a Training Sample (e.g., exploratory factor analysis)

The 67-item HGS was administered to a developmental sample of adults in the United States. Considering the desire to obtain a diverse sample of adults, inclusion criteria was minimal and specified that participants must be adults (18 years of age or older) living in the United States. In line with quantitative research practices, we established an *a priori* sample size (Tabachnick & Fidell, 2013) and delineated our target sample of 1,000 adults. Recruitment and data collection was completed on-line through Mechanical M-Turk. We created a Human Intelligence Task (HIT) for survey completion and offered a $.50 incentive for participants to complete an online questionnaire. The questionnaire included: (a) a research overview that outlined the purpose of the study, (b) a demographic questionnaire (13-items) , (c) the 10-item *Marlowe-Crowne Social Desirability Scale – X1* (MCSDS-X-1; Strahan & Gerbasi, 1972), (d) the 67-item HGS. Of the 1,003 online responses that were recorded, five participants did not complete the HGS, resulting in an initial developmental sample of 998.

Data was entered into the Statistical Package for Social Sciences (SPSS) for further analysis. Data was screened for missing values and tests for statistical assumptions were employed. First, in order to assess the patterns and mechanism of missingness, Little's (1988) missing variable analysis was used in order to explore the mean differences of the 67 items. Although Little's MCAR test was significant indicating data was not Missing Completely at Random (MCAR), χ^2 (5749) = 6092.287, p = .001, a closer look at the missing values indicated that each variable had no more than 2% of missing values supporting that data were Missing at Random (MAR) and therefore ignorable (see Kline, 2011; Osborne, 2013). Additionally, missing data patterns were observed and two cases were removed that had a large number of missing items (e.g., 50%). Listwise deletion is an acceptable approach when data removed is a small percentage of the overall sample and data are MAR (Osborne, 2013). In order to address the remaining missing data, a single imputation method was employed using Expectation-Maximization (EM) estimation through SPSS (Windows Version 25.0). Single imputation is a technique that addresses missing values through EM in order to enhance statistical power and create parameter estimates that are unbiased (Enders, 2010; Graham, 2009). After the missing data was addressed, bivariate and multivariate outliers were identified via Box Plots and Mahalanobis distance respectively and removed (n = 106), resulting in a final sample of 875 for further analysis. Researchers recommend removing outliers, or extreme values, because they can reduce power of statistical tests, increase error variance, and bias results potentially leading to erroneous conclusions (Osborne, 2013). Therefore, the final sample size included a participant-to-item ration (N:p) of 13:1, falling within the recommended ratio ranges for Exploratory Factor Analysis (EFA; see Mvududu & Sink, 2013). Furthermore, researchers have deemed sample size of approximately 500 as good and 1000 as excellent for EFA (Comrey & Lee, 1992), indicating an appropriate sample size. Table 1 represents the demographic data of the developmental sample for the HGS.

Next, statistical assumptions were evaluated including (a) normality, (b) linearity, (c) multicollinearity. Tests of normality were employed by examining the skewness and kurtosis values, histograms, Quartile-Quartile (Q-Q) plots, and Probability-Probability (P-P) plots. Skewness values ranged from -.988 (HGS #14) to 1.165 (HGS #51), and the Skewness value of the HGS Total Score indicated normal data (.290). Kurtosis values ranged from -1.201 (HGS #47) to 1.023 (HGS #14), with the Kurtosis value of the HGS Total Score falling within normal range (-.534). Thus, Skewness and kurtosis values fell within acceptable range (e.g., kurtosis > 7 and Skewness > 2; Pallant, 2013). However, considering the large sample size, further normality tests were needed using additional statistical values. After examining the Q-Q plots, P-P plots, and histograms, all data suggested severe nonnormality. Furthermore, both the Shapiro-Wilks and Komogorov-Smirnov values were significant at the $p < .001$ level, providing further evidence of nonnormality. Therefore, data were not normally distributed at the univariate level and consequent were multivariate nonnormal (Mvududu & Sink, 2013). This information was important to consider when making decisions for factor analysis methods as described in further detail below. We also assessed for linearity using scatter plots. Assumptions of linearity were satisfied since we did not observe nonlinear relationships among variables. Finally, in order to test for multicollinearity, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Barlett's test of sphericity were observed. The KMO value of .984 indicated that the intercorrelation matrix is ideal for factor analysis as values around .80 and .90 are excellent for EFA (see Mvududu & Sink, 2013). Additionally, Bartlett's test of sphericity was significant, χ^2 (221) = 54010.250, p = .000, indicating the correlation matrix was factorable.

Step 6: Administer Items to a Training Sample (e.g., exploratory factor analysis)

In order to evaluate the item pool, EFA was used to examine the initial factor structure of the 67-item HGS. Before evaluating items, researchers must make decisions in regards to the appropriate factor analysis techniques, since there are no strict guidelines. In order to identify the underlying structure of variables, researchers must use relevant theory as well as data (Mvududu & Sink, 2013). Before evaluating scale items, researchers must make decisions in regards to extraction methods and rotation methods, with various options for each step (see Pett, Lackey, & Sullivan, 2003). Decisions

are typically made based on the theory and the data set. After exploring statistical assumptions, we found that the assumption of normality was severely violated. As a result, we utilized principal axis factoring (PAF) as the factor extraction method (Costello & Osborne, 2005).

Rotation methods must also be carefully considered when conducting EFA. Factor rotation helps researchers obtain a simple structure and meaningful factor solution (Pett et al., 2003). The two main categories of rotation methods include: (a) orthogonal, and (b) oblique. An orthogonal rotation assumes that factors are independent, whereas oblique rotations should be used when researchers expect variables are correlated (Watson, 2017). Since we anticipated a correlation among variables, we implemented a Promax oblique rotation method. In order to determine the number of factors to extract we used several methods including: (a) eigenvalues greater than 1, (b) parallel analysis (PA; Horn, 1965), and (c) examination of the scree plot (Cattell, 1966). After employing the aforementioned methods, we initially identified a potential five factor model to explore.

Step 7: Evaluate Pool of Items & Optimize Scale Length

In order to explore item performance on the five factor exploratory factor structure, we analyzed communality values, significant factor loadings, cross-loading of items, inter-item correlations, and number of items per factor. Specifically, we removed items with communality values of .50 or below (Hair et al., 2006), as they are thought to contribute little variance to the overall factor. We also removed items that did not significantly load onto any factor (< .30; Pett et al., 2003) or cross-loaded onto multiple factors (i.e., item loaded > .30 on more than one factor). Lastly, we examined the number of items on each factor and identified items that could be removed in an effort to optimize scale length since EFA aims to cover maximum variance with the least number of factors and items (Blount & Lambie, 2017). After employing the aforementioned strategies, we identified that a three factor model represented the best simple structure. In order to optimize scale length, we carefully examined items on each factor and removed items based the inter-item correlation matrix to help identify potentially redundant items and conceptual fit. We also explored the internal reliability (Cronbach's alpha) for individual factors and items to ensure that items removed did not add much to the overall reliability of the factor or the scale as a whole. This process resulted in a 19-item, 3 factor model. In order to assess for the most parsimonious factor structure, we reloaded each item that was removed back into the factor solution (Tabachnick & Fidelle, 2013). Through a cyclical process, we added items back in to the solution one at a time in order to refine the scale and optimize variance, reliability, and scale length. Two items were reinstated into the final EFA solution, resulting in a 21-item HGS exploratory model. We re-ran a PA, which supported a three factor simple structure model (see Table 2).

Researchers suggest that replication analysis be conducted during EFA in order to further examine the stability of the resulting factor structure and enhance sound solutions during the exploratory phase (Osborne & Fitzpatrick, 2012). We conducted an internal replication analysis in order to test the robustness of our three factor solution. We split the sample (N = 875) into two random samples (n = 437 and n = 437) and randomly deleted one response to establish equal samples. We replicated our EFA using PAF, with an oblique Promax rotation. Analysis revealed the same basic factor structure (i.e., each item had the highest loading on the same factor between the two samples) and overall strong replication as evidenced by squaring the difference of factor loadings for each item (< .04; see Osborne & Fitzpatrick, 2012). Internal reliability was also strong for both samples across each factor, as well as the HGS model as a whole.

The initial results of the preliminary EFA (N = 875) resulted in a 21-item three factor HGS exploratory model accounting for 73.97% of the total variance, which represents a good factor solution (Mvududu & Sink, 2013). Factor 1 represents *Insatiable pursuit for more at all costs* and accounts for 53.48% of the variance; Factor 2 represents the *Desire for more* and accounts for 11.56% of variance, and Factor 3 represents *Retention Motivation* and accounts for 8.94% of variance. The overall reliability of the 21-item HGS is strong as evidenced by a Cronbach's alpha of .956. Table 3 represents the final factor structure of the HGS and Table 4 represents the reliability measures for the exploratory factor solution.

Step 12: Administer Items to a Validating Sample (e.g., confirmatory factor analysis)

In order to determine if the exploratory factor structure is sound with additional samples, confirmatory factor analysis (CFA) was used to examine the factor structure of the 21-item HGS. CFA is an approach to theory testing where a factor structure is statistically analyzed with structural equation modeling (SEM; Mvududu & Sink, 2013). Before evaluating items, researchers must define the model to be tested. The researchers used Analysis of a Moment Structures (AMOS), a statistical software, to develop a structural model predicting the variables that will load on to hypothesized factors as derived from the EFA. The goal of CFA is to examine latent and manifest variables (support by previous theory) and determine if indicators represent the constructs hypothesized (Mvududu & Sink, 2013; Schreiber, Stage, King, Nora, & Barlow, 2006).

The 21-item HGS was administered to a validation sample of adults in the United States. Considering the desire to obtain a diverse sample of adults, inclusion criteria was minimal and specified that participants must be adults (18 years of age or older) living in the United States. We established an *a priori* sample size (Tabachnick & Fidell, 2013) and delineated our target sample of 1,000 adults, similar to the previous EFA analysis. Recruitment and data collection was completed on-line through Mechanical M-Turk. We created a HIT for survey completion and offered a $.50 incentive for participants to complete an online questionnaire. The questionnaire included: (a) a research overview that outlined the purpose of the study, (b) a demographic questionnaire (13-items), (c) the 10-item MCSDS-X-1 (Strahan & Gerbasi, 1972), (d) the 21-item HGS, and (e) the GrEEd Scale (Mussel & Hewig, 2016). Of the 1,025 online responses that were recorded, 19 participants chose not to participate or did not begin the surveys, resulting in a developmental sample of 1006.

Data was entered into SPSS for further analysis and data was screened for missing values and tested for statistical assumptions. Little's (1998) missing variable analysis was used in order to explore the mechanism of missingness. Little's MCAR test was not significant, $\chi^2(294) = 226.952$, $p = .999$, indicating that data were Missing Completely at Random (MCAR) and were therefore ignorable (Osborne, 2013). After observing missing data patterns, two cases with high percentages of missing items were removed (i.e., > 46% missing items). Listwise deletion is an acceptable approach when data removed is a small percentage of the overall sample and data are at least MAR (Osborne, 2013). The remaining missing values were address using single imputation through EM in order to enhance statistical power and create parameter estimates that are unbiased (Enders, 2010; Graham, 2009). Next, bivariate and multivariate outliers were identified via Box Plots and Mahalanobis distance respectively and removed ($n = 82$), resulting in a final sample of 922, which is considered an adequate size for CFA (Kline, 2005). Table 5 represents the demographic data of the validation sample.

Tests of normality were employed through inputting and analyzing data. When evaluating normality in large samples "even slight departures from normality could be statistically significant" (Kline, 2011, p. 63). As a result, Kline (2011) suggested a general rule that absolute values of kurtosis > 10.0 suggest a nonnormality problem and absolute values of skewness > 3.0 indicate extreme skewness. Moreover, evaluation of univariate normality and outliers will typically detect cases of multivariate non-normality (Kline, 2005). In the given data set, skewness values ranged from -.632 (HGS #2) to 1.588 (HGS #1). Kurtosis values ranged from -1.263 (HGS #12) to 1.112 (HGS #1). Thus, based on Kline's "rule of thumb" (p. 63), data was not severely non-normal and was appropriate for CFA.

Step 13: Evaluate Pool of Items and Optimizing Scale Length

In order to evaluate the model fit, several indices were used. Mvududu and Sink (2013) outline the following fit indices that experts have developed including the Root Mean Squared Error of Approximation (RMSEA; indicating the residual), Goodness of Fit Index (GOF; similarity of observed covariance and expected covariance), Standardized Root Mean Square Residual (SRMR; indicating difference between the observed and predicted covariance), Nonnormed Fit (NNFI; coefficient of determination), and Comparative Fit Index (CFI; the extent the proposed model differs from a null model). The initial CFA identified that all observed variables were related to the latent variables and

all three factors correlated. However, overall the indices to assess model fit identified an adequate rather than a good fitting model. Specifically, indices were observed as follows: RMSEA = .072, RMSR = .08, NFI = .945, and CFI = .954. Additionally, the GOF < .05 (p = .000) and was significant rejecting the null hypothesis indicated an inadequate fitting model. However, the GOF can often be inaccurate and a significant difference between covariance matrices is common in large sample sizes; as a result, additional indices should be consulted (Mvududu & Sink, 2013). Therefore, the researchers explored model re-specification through analyzing the modification indices. Modification indices indicated potential covariance between the error terms e4 <> e5, e5 <> e7, e6 <> e9. Additionally, several suggested paths were provided for item #19 and included several high modification indices ranging from 49.95 to 72.72. As a result, we added the aforementioned covariances to the model and removed item #19, improving the model fit. Similar to the previous analysis, the GOF was significant, which was expected given the large sample size. However, the re-specified model indicated fit indices within the range of cutoff values for a good model fit as outlined by previous researchers with RMSEA = .058 (< .06), RMSR = .062 (< .08), NFI = .964 (> .90), and CFI = .973 (> .95; see Brown & Cudeck, 1993; Mvududu & Sink, 2013). The final 20-item HGS model accounted for 59.1% of explained variance and indicated strong reliability (α = .943) and strong internal consistency across factors (Factor 1 [19.27% variance]: α = .949; Factor 2 [18.58% variance]: α =.935; Factor 3 [21.25% variance]: α = .963). The final CFA model and resulting 20-item HGS scale can be found in Appendix A and Appendix B respectively.

Step 14: Evidence of Convergent Validity

In order to assess evidence of validity for the HGS scores, we used bivariate correlations to assess relationships between the HGS and the Greed Scale scores (Mussel & Hewig, 2016) and the MCSDS-X-1 (Strahan & Gerbasi, 1972). Evidence of convergent validity is observed when scales intended to measure similar constructs are correlated (e.g., HGS and Greed scale scores). Nine hundred and forty-three participants completed the Greed scale. In order to assess for the mechanism of missingness, Little's MCAR test was employed indicating data was not MCAR (χ^2 (4446) = 4751.343, p = .001). However, after a closer review of missing data patterns, data was determined to be MAR and therefore ignorable and indiscriminate (Kline, 2011; Osborne, 2013). Additionally, one case was removed via listwise deletion due to the high percentage of missing data on the HGS, resulting in a final sample of 942. Listwise deletion is an acceptable approach when deletion is a small percentage of the overall sample and data are MAR (Osborne, 2013). In order to address missing data, a single imputation method was employed using EM estimation through SPSS (Windows Version 25.0). Next, we tested for extreme values via z scores, box plots, and Mahalanobis distance, and no univariate, bivariate, or multivariate outliers were observed. Finally, monotonic relationships among variables were observed via scatter plots, suggesting data was appropriate for analysis through Spearman Rank-Order (Spearman's rho) correlation.

We used Spearman's rho correlation coefficient to explore the relationships between the HGS total scores and the Greed total scores. The correlations between the HGS total score and Greed Scale resulted in a strong positive correlation (ρ = .743, p < .01; 55.21% of the variance explained). Additionally, all three HGS factor scores correlated with the Greed Scale scores, including *Insatiable pursuit for more at all costs* (ρ = .607, p < .01; 36.84% of the variance explained), *Desire for More* (ρ = .732, p < .01; 53.58% of the variance explained), and *Retention Motivation* (ρ = .316, p < .01; 9.99% of the variance explained).

A total of 1006 participants completed the MCSDS-X1 and the HGS. In order to assess for the mechanism of missingness, Little's MCAR test was employed and found to be significant indicating data was not MCAR (χ^2 (45) = 64.931, p = .027). However, after a closer review of missing data patterns, data was determined to be MAR and therefore indiscriminate and ignorable (see Kline, 2011; Osborne, 2013). Additionally, three cases was removed via listwise deletion due to the high percentage of missing data on the MSDS and HGS, resulting in a final sample of 1003. Listwise deletion is an acceptable approach when deletion is a small percentage of the overall sample and data are MAR

(Osborne, 2013). In order to address missing data, a single imputation method was employed using EM estimation through SPSS (Windows Version 25.0). Next, we tested for extreme values via *z* scores, box plots, and Mahalanobis distance, and no univariate, bivariate, or multivariate outliers were observed. Finally, monotonic relationships among variables were observed via scatter plot matrix, suggesting assumptions were met for Spearman rho's correlation.

Overall, 58.3% of participants (M = 5.04, SD = 2.29) scored below the recommended cutoff score (a total score of 5 or less), indicating social desirability. Therefore, a little over half of the participants were not attempting to answer questions in a socially desirable manner. Spearman's rho correlation coefficient was used to examine the relationship between the MCSDS-X1 and the HGS total score, identifying a significant albeit small negative correlation (ρ = -.263, p < .01; 6.92% of the variance explained). Similarly, all three factors revealed small but significant negative correlations with the MCSDS-X1: *Insatiable pursuit for more at all costs* (ρ = -.203, p < .01; 4.12% of the variance explained), *Desire for More* (ρ = -.228, p < .01; 5.20% of the variance explained), *Retention Motivation* (ρ = -.214, p < .01; 4.58% of the variance explained). As a result, the HGS scores correlated with participants' MCSDS-X1 scores; however, the effect sizes were small.

Table 1
Norm Sample for Development of HGS©: EFA Sample

Data Category	Total (*n*)	Percentage
Race (*N* = 875)		
American Indian/Alaskan Native	8	.9
Asian	79	9
Black or African American	79	9
Caucasian/White	638	72.9
Hispanic/Latino/a	53	6.1
Multi-racial	17	1.9
Native Hawaiian/Other pacific Islander	1	.1
Gender (*N* = 871)		
Female	404	46.2
Male	463	52.9
Non-binary/third gender	4	.5

Table 2
Results from Parallel Analysis: HGS©

1. Factor	HGS Dataset	Random Dataset
1	11.230	1.336
2	2.428	1.264
3	1.878	1.230
4	.573	1.196
5	.494	1.163

Table 3

Final factor structure of the Exploratory HGS©

Heintzelman Greed Scale© (HGS©)	Factor 1	2	3
HGS_51: It is ok to harm others to get what I want.	.955		
HGS_65: I accept that I might have to do bad things in order to get the things that I want.	.921		
HGS_45: I will get what I want at all costs, even if I have to lie.	.880		
HGS_21: I would cheat in order to get what I desire.	.828		
HGS_56: I am so focused on getting what I want, that I don't think about the consequences.	.816		
HGS_15: I use people to help me get what I want.	.815		
HGS_9: I don't think about consequences when pursuing what I desire.	.775		
HGS_39: It is more important to me to get what I want than to have friends.	.746		
HGS_22: It is hard to be grateful for what I have.	.726		
HGS_66: I'm not thankful for what I have.	.715		
HGS_10: I want more than what I already have.		.879	
HGS_47: My goal is to acquire more than what I already have.		.820	
HGS_11: I want to acquire more and more.		.817	
HGS_23: When I think about what I have, I want more.		.805	
HGS_57: I long for more than what I have.		.797	
HGS_19: One of my biggest drives is to have more money.		.740	
HGS_29: I try to get as much as I can of things that I desire.		.722	
HGS_53: I am fearful that I might lose everything I have.			.910
HGS_67: I am concerned that I will lose what I have.			.904
HGS_36: I am afraid that everything I have might be gone one day.			.836
HGS_18: I worry about losing what I have.			.787

Table 4

Reliability of Final Exploratory HGS©

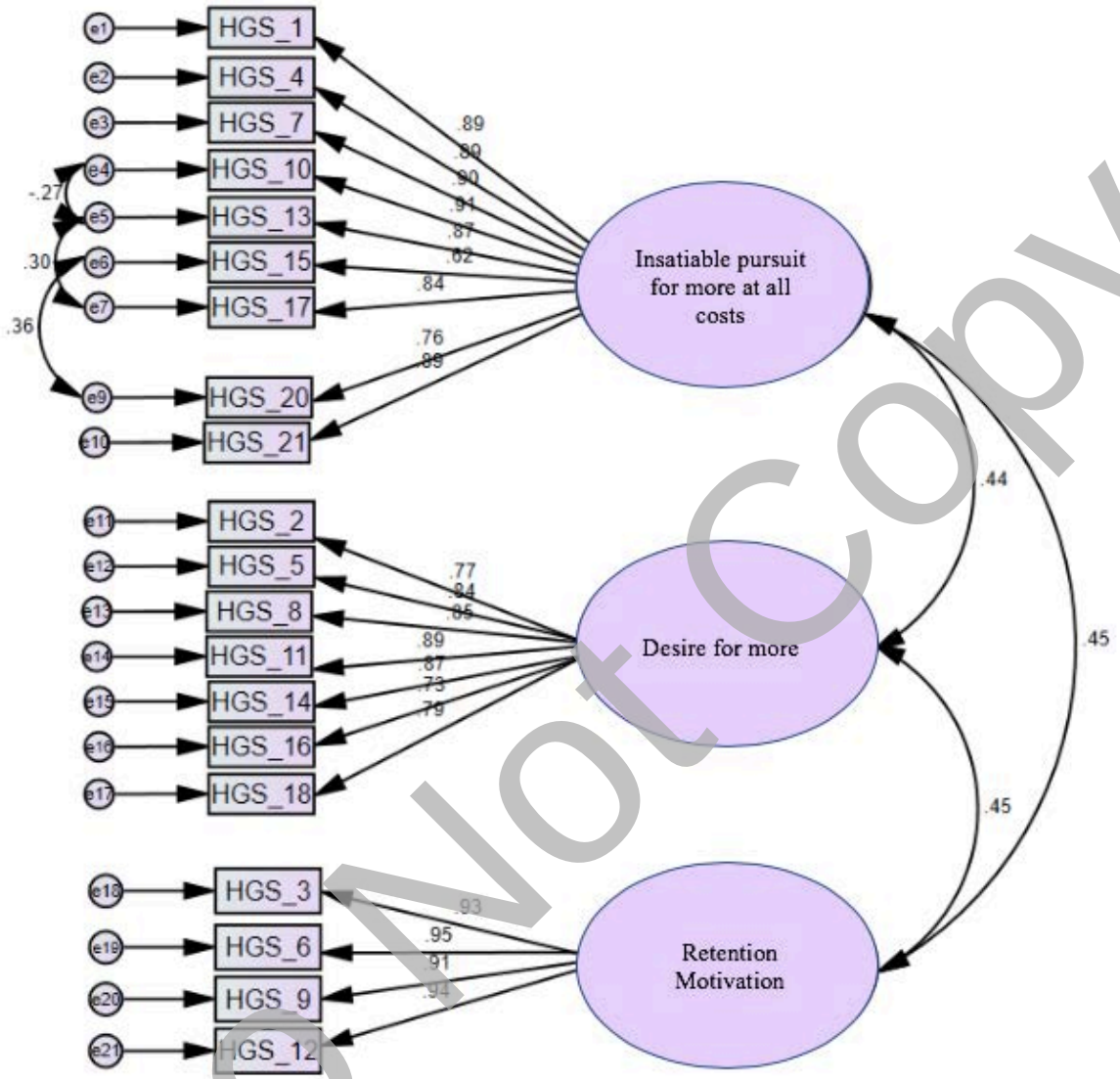
	# of items	Cronbach's α
HGS	21	.956
Insatiable pursuit for more at all costs	10	.956
Desire for more	7	.931
Retention Motivation	4	.928

Table 5

Norm Sample for Development of HGS©: Validation Sample (CFA)

Data Category	Total (*n*)	Percentage
Race (*N* = 922)		
American Indian/Alaskan Native	8	.9
Asian	91	9.9
Black or African American	89	9.7
Caucasian/White	646	70.1
Hispanic/Latino/a	53	5.7
Multi-racial	29	3.1
Native Hawaiian/Other pacific Islander	3	.3
Other	3	.3
Gender (*N* = 918)		
Female	488	52.9
Male	427	46.3
Non-binary/third gender	3	.3
Marital Status (*N* = 919)		
Married or living with a partner	482	52.3
Widowed	20	2.2
Divorced	81	8.8
Separated	16	1.7
Single	315	34.2
Other	5	.5
Education (*N* = 921)		
Less than high school degree	5	.5
High school degree or equivalent	99	10.7
Some college but no degree	197	21.4
Associate degree	91	9.9
Bachelor degree	389	42.2
Graduate degree	140	15.2

Confirmatory Factor Analysis Structure of HGS©



Appendix B: Heintzelman Greed Scale (HGS)

Heintzelman Greed Scale© (HGS©)

Using the 5-point Likert scale provided below, please indicate the degree to which you agree or disagree with each statement about yourself within the last month.

- **Strongly Disagree**: You disagree with this statement in most situations.
- **Moderately Disagree**: You disagree with this statement in some situations.
- **Neither Agree nor Disagree**: You do not agree or disagree with this statement.
- **Moderately Agree**: You agree with this statement in some situations.
- **Strongly Agree**: You agree with this statement in most situations.

Strongly Disagree 1	Moderately Disagree 2	Neither Agree nor Disagree 3	Moderately Agree 4	Strongly Agree 5

Statements	Response				
1. It is ok to harm others to get what I want.	1	2	3	4	5
2. I want more than what I already have.	1	2	3	4	5
3. I am fearful that I might lose everything I have.	1	2	3	4	5
4. I accept that I might have to do bad things in order to get the things that I want.	1	2	3	4	5
5. My goal is to acquire more than what I already have.	1	2	3	4	5
6. I am concerned that I will lose what I have.	1	2	3	4	5
7. I will get what I want at all costs, even if I have to lie.	1	2	3	4	5
8. I want to acquire more and more.	1	2	3	4	5
9. I am afraid that everything I have might be gone one day.	1	2	3	4	5
10. I would cheat in order to get what I desire.	1	2	3	4	5
11. When I think about what I have, I want more.	1	2	3	4	5
12. I worry about losing what I have.	1	2	3	4	5
13. I am so focused on getting what I want, that I don't think about the consequences.	1	2	3	4	5
14. I long for more than what I have.	1	2	3	4	5
15. I'm not thankful for what I have.	1	2	3	4	5
16. One of my biggest drives is to have more money.	1	2	3	4	5
17. I don't think about consequences when pursuing what I desire.	1	2	3	4	5
18. I try to get as much as I can of things that I desire.	1	2	3	4	5
19. It is hard to be grateful for what I have.	1	2	3	4	5
20. I use people to help me get what I want.	1	2	3	4	5

Thank you for completing the HGS!

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