The Intended Heroic Behavior Scale:

Creation and Validity of a Scale Predicting Heroism

to Advance Developmental Research on Heroes

Dissertation By

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Abstract

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Heroism – the phenomenon of individuals putting themselves at risk for the benefit of others – is a topic of increasing empirical interest (Franco et al., 2017). Applied heroism training programs have emerged with the goal of fostering heroism (Heiner, 2018). Psychologists have examined the characteristics of heroes (e.g., Midlarsky et al., 2005) and the power of the situation to drive ordinary people to heroic action (Franco et al., 2017). These studies have raised important questions, such as how can heroism be predicted? Does heroism training work? And how do heroes develop? Current methods of studying heroism, including exemplar studies, can only be performed after a person has been recognized for a heroic act. Due to these and other limitations of current heroism measures, the field of heroism science needs a measure that can predict which individuals are likely to act heroically, gather large and diverse samples of potential heroes, and measure changes over time in an individual's intention to act heroically. To address these needs in the field, in a series of five studies, I created and assessed the validity of a scale, called the Intended Heroic Behavior Scale (IHBS), which collects valid data on the intention to behave heroically. In Study 1, experts in the field rated the content of potential scale items and recommended changes and additions to the scale. In Study 2, laypeople assessed the face and

content validity of the items by rating how realistic each scenario was, how clear the benefit to others was, and how clear the risk was to the hero. In Study 3, I performed item reduction and exploratory factor analysis to uncover the smallest number of items that would account for the most variance, as well as measuring correlations showing evidence of discriminant and convergent validity. In Study 4, I performed confirmatory factor analysis to confirm the factor structure uncovered in Study 3. This study revealed the items were measuring a general factor of intended heroism and two independent factors of social and civil heroism. Study 4 also demonstrated the scale's convergent and discriminant validity. Finally, in Study 5, I tested the final 8-item version of the IHBS with a known group of heroes and compared their scores to nonheroes. The IHBS appears to generate valid data on heroism and can distinguish between heroes and nonheroes. The IHBS can be used to predict heroism, which will enable the field of heroism science to assess the effectiveness of hero training programs and answer important empirical questions.

Dedication

I am most grateful to my wife, Teresa, whose love and support sustained me through this dissertation. Teresa, your guidance, time, direction, stress, play, work, silliness, compassion, listening ear, and love were immeasurable. I love you, and I thank you. I am also incredibly grateful to my children, Chloe and Malcolm. I have been a graduate student all of their lives, and attempting to keep up with them during their development has stretched and broadened my understanding of developmental psychology. I greatly appreciate the times they pulled me away from work to play. I love you, and I wish I had played more.

I would also like to acknowledge the support my grandparents, Bob and Di-Ann, gave me. I do not think I would have completed this project without all of your aid. Thank you to my parents, Ross and Tammy, who supported my curiosity and provided me with the learning opportunities to stretch and explore since I was young.

I am grateful for the guidance of my dissertation committee members and faculty at Claremont Graduate University: Professors Kendall Cotton Bronk, Jason T. Siegel, and Jeanne Nakamura. From your classes to the conclusion of this project, I have learned and developed quantitative and qualitative research skills, leadership, empathy, patience, attention to detail, presentation and teaching skills, and responsibility and excitement for the development of the field of positive psychology. Thank you, professors; I am proud of the professional I became under your guidance.

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Chapter 1 Introduction to Heroism Science

Heroes have been depicted in prehistoric cave paintings, legends, myths passed down

before written language, and more recently in epic poems and films (Carlyle, 1993; Hook, 1943;

Kohen, 2013), demonstrating heroism has been of interest to humanity for millennia. Heroes

rescue people, serve as examples that can inspire prosocial behavior, and generally make the

world a better place (Franco et al., 2017). For these reasons, heroism has been called the pinnacle

of human behavior (Allison et al., 2019; Allison & Goethals, 2011). Despite this, systematic

research on heroism has only recently emerged, and empirical studies have primarily examined

the characteristics and taxonomies of heroes (Dunlop & Walker, 2013; Midlarsky et al., 2005;

Riches, 2017) and how the social situation may play into the decision to act heroically (Franco et

al., 2011; Franco & Zimbardo, 2006). In addition, researchers have proposed theoretical

frameworks to explain the development of heroism (Kohen et al., 2017; Schmid Callina et al.,

2017). These initial investigations into heroism are promising, but much more empirical research

on heroism is needed to truly understand the phenomenon.

A quantitative measure of heroism is needed to move the field of heroism science

forward. To date, much research on heroes has relied on exemplar studies. Exemplar sampling

methods are prominent in the developmental sciences because they allow researchers to

investigate individuals or groups that are strong examples of the construct (Bronk, 2012).

Sampling only those who exemplify the construct allows researchers to focus on the extreme

ends of a construct, which are difficult, if not impossible, to evaluate with random samples

(Bronk, 2012; Bronk et al., 2013). Many exemplar studies in heroism science have been

qualitative in nature (e.g., Oliner & Oliner, 1988). A review of the literature reveals that while the exemplar methodology and qualitative methods continue to be important ways of understanding the lived experience of heroes, a quantitative scale of heroism is needed to move the field forward (Heiner, 2018).

The field of heroism science needs such a scale for four main reasons. First, such a scale would identify individuals who are likely to act heroically in the future. Second, such a scale could gather large and diverse samples of potential heroes for investigation. Third, such a scale could track change over time in intended heroic behavior, including as a result of interventions designed to cultivate the intention to act heroically. Finally, such a scale would enable researchers to more fully understand how heroes develop.

The purpose of this dissertation is to develop and evaluate a new measure of intended heroic behavior. The structure of the dissertation is as follows. The remainder of this chapter reviews psychological research on heroes and heroism. Chapter 2 reviews existing measures of heroism and closely related constructs and features an analysis of their limitations. In Chapter 3, I describe two studies I conducted to examine the face and content validity of a scale of intended heroic behavior in both expert and layperson samples. Chapter 4 reviews an exploratory factor analysis of the scale and examines correlations between the scale items and social desirability. Chapter 5 reviews a confirmatory factor analysis of the scale, and additional assessments of validity. In Chapter 6, I describe a study comparing the scores between heroes and laypeople which found the scale could identify heroes. In Chapter 7, I describe the implications and uses of this scale, the limitations of the studies, and future directions the field could take with this new scale.

Defining Heroism

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To study a topic empirically, a clear definition of the construct is essential. Contemporary scholars interested in studying heroism have embraced the following definition: Heroes are people who choose to act in a way that knowingly puts their future adaptive individual ↔ context relations at risk, to improve the future adaptive individual ↔ context relations of others who are not related to them (Schmid Callina et al., 2017). Heroes' individual ↔ context relations refer to bidirectional relationships between heroes and their environments. In other words, this definition acknowledges that heroes influence and are influenced by their contexts (Lerner, 1991; Overton, 2015; Schmid Callina et al., 2017). Heroes are individuals who change their contexts (e.g., systems, organizations, companies, environments) so they are better adapted to other's development. For instance, a hero who blows the whistle on unethical or illegal behavior in their workplace may risk losing their job or being threatened, imprisoned, or killed. However, they act in the hope of stopping the unethical behaviors and changing the systems, organizations, companies, and governments that support these behaviors. Similarly, a prototypical hero, such as a civilian who rescues a stranger from a fire, risks their life to increase the possibility the stranger will live a healthy life. Accordingly, heroism is choosing to act in situations that present a significant risk to the hero's physical, mental, social, or economic wellbeing, now or in the future, and this risky action is undertaken for the benefit of people who are not related to them.

There are two key components of the definition of heroism. The first is risk to the hero. The risk must be engaged in voluntarily and with recognition of the possible costs (Franco et al., 2011). Civilian fire rescuers often risk their safety, and whistleblowers often risk their jobs or being jailed. These risks could have detrimental effects on the heroes' future adaptive individual ↔ context relations. For example, a civilian fire rescuer may face physical consequences, such

as serious burns, that make healthy and positive development in the future difficult. These risks also distinguish civil from social heroes as described by Franco et al. (2011). A civil hero is a hero who takes on primarily physical risks such as a civilian fire rescuer, while a social hero is a hero who takes on primarily social risk such as a whistleblower (Franco et al., 2011). Martial heroes are a third category of hero that includes trained professionals who go above and beyond the call of duty when taking on risks to benefit others (Franco et al., 2011). However, the purpose of this dissertation is to focus on civilian heroism like that of civil and social heroes. The first component to the definition of heroism is that heroic action puts adaptive developmental processes at significant risk.

The second component is the benefit to others. Rescuing someone from a burning building may save someone's life or protect them from serious injury. Clearly, a person whose life is saved has the opportunity to continue living and developing in a positive and healthy way. Alternatively, whistleblowers often act to change contexts, and in so doing, promote future adaptive individual ↔ context relations for others. The actions whistleblowers take may improve the social or physical ecology of the state, company, or organization in which they are involved. A concrete example of this behavior is Kathryn Bolkovac, who was working with the U.N. International Police Force in Bosnia and blew the whistle on sex trafficking by U.N. personnel (Bolkovac & Lynn, 2011). Bolkovac was fired and publicly shamed for her heroism, but her actions changed aspects of the system facilitating human trafficking and some of the contexts supporting it (Bolkovac & Lynn, 2011). If all the systems, hierarchies, and cultures leading to human trafficking were changed, many people could have been saved and allowed to develop in healthy ways through interactions with positive communities and family. In short, whistleblowing can make contexts more likely to promote adaptive individual ↔ context

relations. Heroes benefit others by changing the context or individual ↔ context relations in ways that allow nonrelative others the opportunity to continue to develop their capacities, build strengths, and thrive across their lifespans. This is what is meant by future adaptive individual ↔ context relations. This benefit to others is the second component of the definition of heroism. Both the benefit to others and a risk to self are required for heroic action.

Heroism and Relational Developmental Systems Metatheory

This conception of heroism is best understood in light of the relational developmental systems (RDS) model (Lerner, 1991; Overton, 2015). The RDS metatheory highlights the individual–context interaction, human plasticity, and the impact of both nature and nurture in the continuous and discontinuous development of heroes. First, the RDS metatheory identifies bidirectional individual–context interactions as the basic process of human development (Lerner, 1991; Overton, 2015). For a hero, this means individual development happens throughout the lifespan through interactions with the hero's multiple contexts, including their social relationships, family systems, and cultural contexts (Ford & Lerner, 1992; Lerner, 1991, 2006; Overton, 2015). These bidirectional interactions mean heroes change and are changed by their contexts over time (Lerner, 1991; Overton, 2015). For example, individuals are more likely to act heroically when their parents model caring behavior and communicate caring values (Oliner & Oliner, 1988) and when they themselves engage in small prosocial acts, such as donating and volunteering, throughout their lives (Midlarsky et al., 2005, Midlarsky et al., 2006). In these ways and others, contexts influence the likelihood that others will act heroically. In summary, the RDS metatheory contributes to understanding how heroes interact with their contexts as they develop.

In addition to emphasizing the individual–context interaction, RDS metatheory also emphasizes the relative plasticity of development (Lerner, 1991, 2006; Overton, 2015). In other words, this theory proposes that all people can change, especially if their contexts change (Ford & Lerner, 1992; Lerner, 1991, 2006; Overton, 2015; Schmid Callina et al., 2017). Based on this assumption, heroism training programs teach participants about the bystander effect, help them to imagine themselves acting heroically, and encourage them to build a habit of engaging in frequent prosocial acts, all in an effort to make participants more likely to act heroically if and when the opportunity arises (Kohen et al., 2017; Svoboda, 2013). The RDS metatheory's emphasis on relative plasticity in development may also mean a person can become more or less likely to act heroically at any point in their lifespan.

RDS metatheory also rejects splits or dichotomies, as such it holds that development is not driven by either nature or nurture, but instead by interactions between nature and nurture (Lerner, 1991; Overton, 2015). By contrast, the nativist view suggests that personality and other relatively stable characteristics, such as courage and empathy, are innate (King et al., 2015). However, research suggests these relatively stable characteristics develop over time and as a result of experience and biology (Berkowitz, 1997; Saarni et al., 2006; Snyder & Ickes, 1985). Therefore, the development of heroism may also require both nature and nurture.

Finally, RDS theories propose that development is both continuous and discontinuous in nature (Lerner, 1991, 2006; Overton, 2015). Continuity of development refers to a stable, consistent, or continuous change, whereas discontinuous development entails clear delineations or jumps in ability or capacities, these more dramatic changes sometimes are referred to as stages. This has important implications for heroism. The experience of acting heroically, and the consequences of doing so, might change a person in a discontinuous manner. This would make it

difficult to infer much about what led a hero to act heroically in the first place (Franco et al., 2016). This challenge further points to the need to study potential heroes before they become actual heroes. Investigating individuals participating in heroism training might provide examples of continuous development. One example is participants who learn skills and abilities that build on their previously acquired skills. Thus, through RDS metatheory, heroism scientists understand some aspects of heroes' development to be linear and gradual and other aspects to be more significant and sudden.

In sum, understanding the definition of heroism from an RDS perspective is useful for considering how heroes develop and how they may be trained. With this understanding, every hero is a relational developmental system; a hero is amenable to intraindividual change throughout their lifetime, being affected by their context, making choices, and affecting their context as they develop during their life in continuous and discontinuous ways.

Distinguishing Heroism from Related Constructs

It is important to define heroism, but it is also important to clarify what heroism is not. Heroism has been conflated with prosocial behavior and altruism in many empirical works (e.g., Fagin-Jones & Midlarsky, 2007). Scales of courage and moral courage have been used as stand-ins to assess heroism, and social responsibility and empathy are such commonly correlated constructs of heroism that they too have been used as measures of heroism (Heiner, 2018; Franco et al., 2011; Midlarsky et al., 2005, 2006). However, to move the field of heroism science forward, it is necessary to distinguish heroism from related constructs.

Distinguishing Heroism from Prosocial Behavior and Altruism

Prosocial behavior is defined as voluntary and intentional help to others (Batson & Powell, 2003), and it is related to concepts such as cooperation and sympathy (Batson, 2012;

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Hay, 1994). Although prosocial actions always benefit others, they often also benefit the actor. A clear example of prosocial behavior is volunteering in a community. Many people who begin to volunteer in their community continue to do so because they derive from the experience a sense of community, connection, and closeness to others (Omoto & Snyder, 2002; 2010). For some people, these benefits are the primary motivation to continue volunteering (Omoto & Snyder, 2002; 2010). In this way, prosocial behavior is a voluntary helping behavior that can benefit the person helping. By contrast, far from being personally beneficial, heroism puts the actor at risk.

Researchers have also used altruism as a stand-in for heroism, but again, important distinctions exist. Altruism refers to a specific type of prosocial behavior carried out to achieve positive outcomes for another, rather than for the self (Rushton, 1981). Altruism is a distinct form of prosocial behavior, because while prosocial behavior may be motivated by self-centered or egoistic motivations, altruistic behavior is motivated only by a concern for others (Batson, 2012; Midlarsky et al., 2005). Giving $20 to a homeless person or anonymously donating to a food bank are examples of altruistic acts. In both cases, the action helps another, but it does not benefit the actor. In this way, altruism is a special type of prosocial behavior that does not benefit the helper. However, altruistic actions like these are performed at no risk to the actor, a point that has prompted disagreement in the field. There are researchers who would include risky altruistic actions under the umbrella definition of altruism (Piliavin, 2009). Other researchers refer to an altruistic act that carries risk to the actor as "extreme altruism" or "courageous altruism" rather than heroism (Fagin-Jones & Midlarsky, 2007; Rand & Epstein, 2014). Still others classify altruism that carries risk for the actor as heroism, and these individuals who have performed risky and altruistic actions have been featured in studies of decorated or recognized heroes, including Carnegie Hero Medal Recipients (Rand & Epstein, 2014) and rescuers during the

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Holocaust (Fagin-Jones & Midlarsky, 2007). While there may be disagreement in the field about whether to call this behavior extreme altruism or heroism, it is fundamentally risk to the hero that distinguishes heroism from altruism (Franco & Zimbardo, 2016; Franco et al., 2017). Both heroes and altruists help others, but only heroes do so at their own risk.

Heroism has been defined as altruism plus risk (Franco & Zimbardo, 2016). Altruistic actions may pose no, or minimal, risk to the actor. Heroic acts, on the other hand, necessarily involve substantial risks to the actor (Franco et al., 2011). Some acts defined as altruistic may represent heroism, but most altruistic acts do not involve risk. Thus, researchers should take care to avoid conflating the terms extreme altruism and heroism. Additionally, empirical evidence suggests helping in a high-risk situation is qualitatively different from more general helping (Greitemeyer et al., 2006). In short, conceptual overlap exists between heroism and altruism, however, heroism is a distinct behavior.

Distinguishing Heroism from Moral Courage, Social Responsibility, and Empathy

While altruism and prosocial behavior are the constructs most commonly conflated with heroism, other constructs, such as moral courage, social responsibility, and empathy, have also been conflated with heroism. Moral courage is sometimes used synonymously with the term civil courage, which originated from the German concept of zivilcourage (Frohloff, 2001; Greitemeyer et al., 2007; Voigtländer, 2008). The risk embodied in moral courage involves speaking against the breaking of norms and values a person feels it is essential to uphold (Greitemeyer et al., 2007; Meyer & Hermann, 2000). Moral courage is motivated by a deep sense of justice or personal values and a pervading sense that something is not right. Some researchers require the action to be accompanied by anger or indignation (Frohloff, 2001; Greitemeyer et al., 2007). Moral courage is evident when individuals speak out against displays

of xenophobia, homophobia, sexism, racism, or ableism. However, this courageous form of speech can, and often does, occur when there is no specific individual to protect or help (Frohloff, 2001; Greitemeyer et al., 2007; Meyer & Hermann, 2000). Moral courage is most closely related to acts of social heroism, including whistleblowing. However, while people acting with moral courage and heroism are both taking a risk, heroism must benefit a person or people, while moral courage need not benefit any specific individual or context. In addition, acts of heroism do not need to be motivated by a deep sense of justice, personal values, and a sense that something is not right. Its lack of deep indignation or motivation by a sense of justice distinguishes heroism from moral courage.

Social responsibility also shares features with heroism. Social responsibility is a "sense of duty or obligation to contribute to the greater good" (Wray-Lake & Syvertsen, 2011, p. 12). Many studies have used assessments of social responsibility as proxies for heroism, and most of these find heroes score higher, or rate themselves higher, in social responsibility than nonheroes (Greitemeyer et al., 2007; Midlarsky et al., 1999; Midlarsky et al., 2005, 2006; Riches, 2017). While social responsibility is highly correlated with heroism, the terms are not synonymous. A person who feels social responsibility may act in a number of prosocial ways with little to no risk to themselves. For instance, socially responsible acts include volunteering and community organizing. A person may have a strong sense of social responsibility and never act heroically. Although they may help others, they may do so at little to no risk to themselves. In this way, social responsibility is also related to, but distinct from, heroism.

Finally, empathy is another construct used as a proxy for heroism. Empathy, or the ability to take another person's perspective cognitively and emotionally, is highly correlated with heroism (Midlarsky et al., 2005; Osswald et al., 2004). Empathy may motivate a heroic act, but it

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is not a heroic act in and of itself. Acting empathically, unlike acting heroically, does not require risk to the self.

Although heroism is not the same thing as prosocial behavior, altruism, moral courage, social responsibility, or empathy, similarities exist among these various concepts. Helpfully, measures of each of these constructs exist, and they provide a useful starting point for considering a measure of intended heroic behavior.

History of Heroism Conceptions and Research

Heroes have been part of the human experience for millennia (Becker & Eagly, 2004; Carlyle, 1993; Hook, 1943; Kohen, 2013), but conceptions of what a hero is have evolved over time. Researchers point to five time periods in the evolution of conceptions of heroism (Efthimiou, 2017). These time periods are the prehistoric and ancient period, the early Christian and medieval period, the modern period, the postmodern period, and the scientific period (Efthimiou, 2017).

The prehistoric and ancient period covers the prehistoric period to about the 1st century A.D. (Efthimiou, 2017). Throughout this time, heroes were featured in oral traditions. Evidence of these stories can be found in cave paintings and early writings (Carlyle, 1993; Hook, 1943; Seal, 2009). In works during the Homeric period, heroes were considered gods and demigods who might be mortal or immortal (Efthimiou, 2017, Kohen, 2013). In works such as Homer's *Iliad* and Virgil's *Aeneid*, heroes were largely portrayed as individual, legendary figures of the battlefield, who engaged in particularly courageous and risky actions (Kohen, 2013). Closer to the 1st century BC, Socrates and Plato portrayed heroes as forces for social good in cities and civilizations rather than exclusively on the battlefield (Franco et al., 2017; Kohen, 2013).

In the early Christian and medieval period, from the 1st century AD to the early 15th century, conceptions of heroism evolved (Efthimiou, 2017). Stories of King Arthur's knights are prototypical examples of heroism literature at this time. Courage and self-sacrifice for the greater good became defining characteristics of heroes. These are characteristics many people recognize as heroic today (Allison & Goethals, 2011).

During the modern period, from the late 15th century to 1949, conceptions of heroism grew to include heroic sacrifice, which encompassed sacrifice for individual others, rather than exclusively for the greater good (Efthimiou, 2017). Additionally, European philosophers, such as Jean-Jacques Rousseau and David Hume emphasized the influence heroes had as role models (Franco et al., 2017).

The postmodern era of heroism history and research, from 1949 to 2006, was heavily influenced by Joseph Campbell's work on heroes in myths and literature across cultures (Efthimiou, 2017). Campbell (2008) described heroes as people who navigated a hero's journey. During this journey, the hero accomplishes goals, saves others, overcomes trials, and finally returns to their everyday life to share lessons learned (Campbell, 2008). Australian, Asian, African, Ancient Greek, Native American, and Polynesian cultures feature stories, myths, and legends of heroes whose paths follow this pattern, demonstrating the hero's journey represents a nearly universal conception of heroism (Campbell, 2008). In addition to describing the characteristics of a hero, Campbell (2008) also prescribed heroic action; when individuals act heroically, people, communities, and countries benefit.

Modern psychological research on heroes began around 2006 with Franco and Zimbardo's (2006) paper on the "banality of heroism". This period, from 2006 to today, has been dubbed the "scientific phase of heroism" (Efthimiou, 2017). However, the roots of this scientific

phase appear much earlier. The origins of empirical investigations into heroism – or, perhaps more aptly, into the lack of heroism – emerged around the Second World War, when the Holocaust unfolded. Researchers began to investigate the "banality of evil" (Arendt, 1963), bystander apathy (Latané & Darley, 1970), obedience to authority (Milgram, 1963), and the life experiences and characteristics of altruistic rescuers (Oliner & Oliner, 1988). These studies, aimed at understanding the atrocities of the Holocaust, demonstrated the power of the situation to pressure people to act contrary to their moral values. More recently, researchers have used the same logic and evidence about altruistic rescuers to understand how situational forces and development of positive characteristics can shape people to do good.

Since the beginning of the 21st century a small but growing body of psychological and transdisciplinary work on heroes has strongly suggested that understanding heroism is a worthy line of inquiry. Many researchers have focused on using the exemplar method to uncover taxonomies of heroes (Franco et al., 2011; Franco et al., 2016; Midlarsky et al., 2006; Oliner & Oliner, 1988; Riches, 2017; Walker et al., 2010). They did this by categorizing heroes according to the shared nature of their actions or by investigating the characteristics of heroes. Other researchers have examined laypeople's conceptions of heroes and the social functions of heroes (Allison & Goethals, 2011; Franco et al., 2016; Kinsella et al., 2017). There have also been investigations into the genetic and evolutionary basis of heroism (Preston, 2013, 2017). Finally, heroism training programs have been developed, which strive to train everyday people to act heroically when the situation calls for it (Franco et al., 2016; Heiner, 2018; Hero Construction Company, 2019; Heroic Imagination Project, 2017; Kohen et al., 2017; Schmid Callina et al., 2017). Since the start of the 21st century researchers have made great strides in building a science

of heroism, but they have stalled. Without the proper tools, they are unable to address important questions.

Current Questions in Heroism Science

There are three questions that preoccupy researchers in the field, including "How can heroism be predicted?", "How do heroes develop?", and "Does heroism training work?"

How Can Heroism Be Predicted?

Understanding how to predict who is likely to act heroically, when given the opportunity, is perhaps the most important need to address for the growth of the field. Being able to predict who is likely to act heroically if given the opportunity would enable developmental studies of heroism. Likely heroes could be studied over time, including before they act heroically. This would reveal important insights into the experiences and characteristics that contribute to heroic action. Addressing this question would also enable researchers to compare the effects of heroism training on people who are likely to become heroes and on those who are not.

To explore what heroes' lives looked like before they became heroes, researchers have used retrospective analysis. However, this method is problematic because measurements of personality or characteristics after heroic actions do not capture the state of these characteristics prior to the event (Franco et al., 2016). The consequences of heroic action could change individuals so dramatically that they may not be able to accurately report on who they were before they became heroes (Franco et al., 2016). This is especially true when individuals are studied years after their heroic action. While these changes are expected when looking at development from an RDS perspective, this situation makes it difficult to understand the complex relationships that existed among characteristics, contexts, various influences, turning-

points, progressions, and stagnation in development prior to the heroic act. In short, retrospective analysis falls short as a means of shedding light on what an individual was like prior to acting heroically.

Simulations provide another way of seeing what individuals were like before they acted heroically (Franco et al., 2017). A simulation could reveal much about the cognitive, emotional, and characteristic states of potential heroes immediately preceding a heroic action (Franco et al., 2017). However, the risks inherent in simulations present ethical challenges (Schmid Callina et al., 2017). For one, the level of risk required for heroism virtually assures regulatory boards will not approve these studies. To avoid this methodological difficulty, another possibility is to use a proxy for heroism, such as prosocial or altruistic behavior, in a simulated situation. While prosocial and altruistic behavior are strongly correlated with heroism, as already discussed, they are distinct constructs. A simulation of more ethically palatable situations requiring prosocial or altruistic actions would reveal a considerable amount about these correlates of heroism but would not provide valid data on heroism.

Yet another way to explore this question would be to conduct prospective longitudinal studies (Schmid Callina et al., 2017; Walker, 2017). This could involve tracking a sample of otherwise typical individuals from early childhood to late adulthood. The hope would be that at least some of the individuals would ultimately act heroically, and in this way, researchers would discover some of the developmental pathways of heroes (Schmid Callina et al., 2017; Walker, 2017). However, this type of study would be time consuming and costly, not least because it is likely few participants in the sample would encounter a situation requiring heroic action. Additionally, those few participants who do act heroically may not report their actions; individuals who act heroically often claim they are not heroes (Kohen & Sólo, in press).

Investigations into the development of heroism before and after heroic actions are clearly needed. However, identifying heroes requires a scale capable of predicting if a person is likely to act heroically.

Finally, another way of predicting who will act heroically would be to use a proxy for heroism. Courage, prosocial behavior, and altruism have all been used as proxies for heroism. Each of these constructs is related to heroism, but as noted above, each is distinct from the construct, and, as such, none would offer valid data on heroism. Heiner (2018) used a courage scale to assess the likelihood that participants would act heroically. Courage was defined as "the ability to act for a meaningful (noble, good, or practical) cause despite experiencing the fear associated with a perceived threat exceeding the available resources" (Woodard, 2004, p. 174). Courage was measured with the Woodard and Pury (2007) moral courage scale, which asks participants how likely they would be to act in a particular situation, and how fearful they would be in that situation. In this evaluation, Heiner (2018) assessed the Hero Construction Company school presentation by asking participants to complete a pretest survey, engage in the heroism training, and then complete a posttest survey, with a follow-up survey 30 days later. This study demonstrated that heroism training increased courage in participants, and these effects lasted for at least one month. Additionally, the study demonstrated the utility of experiments in studying the development of heroism. However, this study measured courage rather than heroism. Only a scale of intended heroic behavior that predicts how likely a person is to act heroically could measure heroism.

In short, existing approaches fail to enable researchers or practitioners to predict who will act heroically, or who is likely to take risky action for the benefit of one or more people.

Accordingly, a quantitative scale of intended heroic behavior is needed to advance the field of heroism science.

How do Heroes Develop?

In addition to needing to predict who will act heroically, researchers in the field of heroism science have also called for measures that will reveal how heroes develop (Schmid Callina et al., 2017). In fact, questions about the development of heroism are the most posed questions in the recently published Handbook of Heroism (Allison et al., 2017). Numerous articles, scientific papers, and books have been titled "What makes a hero?" (e.g., Frisk, 2019; Lickerman, 2010; Riches, 2017; Schlenker et al., 2008; Svoboda, 2013; Zimbardo, 2011). The aim of these works is to provide observations on how heroes come to be the people they are. Researchers have suggested developmental frameworks to understand heroism (Kohen et al., 2017), as well as calling for more research into the development of heroism (Bronk & Riches, 2017; Schmid Callina et al., 2017). Based on this research, there seems to be an awareness in the field that heroism science lacks a developmental framework. Researchers need to investigate the development of heroism to understand individuals' experiences, characteristics, and contexts in adolescence and early adulthood that incline some of them to act heroically.

Does Heroism Training Work?

Finally, there is a need for a measure that can be used to evaluate the efficacy of the growing number of heroism training programs. Heroism training has become popular over the last decade since the creation of the Heroic Imagination Project; however, there is little empirical evidence of its effectiveness. Organizations such as the Hero Construction Company and the Heroic Imagination Project have created interventions to train laypeople, both children and adults, to be heroic (Hero Construction Company, 2019; Heroic Imagination Project, 2017). The

design of these interventions is based on the underlying theory of heroic imagination. Heroic imagination is a mindset or a collection of attitudes about helping others in need when those actions are risky (Franco et al., 2011; Kohen et al., 2017). Consistent with the theory of planned behavior, these attitudes are considered predictors of future heroic behavior (Ajzen, 1991). Heroism training programs focus on three key components. The first is teaching participants about social psychological concepts such as the bystander effect, diffusion of responsibility, and bias reduction; the second is inspiring participants to imagine themselves as heroes or engaging in heroic action (Svoboda, 2013); and the third is encouraging small acts of prosociality, especially daily helping behaviors, as a form of "heroism light" to prepare people for later heroic action (Svoboda, 2013). However, it is unclear if these heroism training tools work. A scale that assesses change over time in heroic intention is needed to evaluate these programs (Heiner, 2018).

This dissertation is chiefly concerned with the development of a scale of intended heroic behavior. Intended heroic behavior is the intention to act for the benefit of nonrelative others in situations that present significant risk to the hero's physical, mental, social, or economic wellbeing. In other words, intended heroic behavior is the intention to act heroically should the situation arise. A measure of intended heroic action would enable (1) researchers to predict who is likely to act heroically, (2) scholars to study the development of heroism over time, and (3) evaluators to assess the effectiveness of heroism training programs. The following chapter discusses the measures currently used in the investigation of heroism, the limitations of those measures, and the first steps in the development of a scale of intended heroic behavior.

Chapter 2: Measurement of Heroism and Current Limitations

Existing Measures of Heroism and Closely Related Constructs

Measures of related constructs provided a useful starting point for the design and validation of the present scale of intended heroic behavior. Exemplar studies, which have been used to study heroes, have relied on interviews (e.g., McNamee & Wesolik, 2014; Oliner & Oliner, 1988; Walker et al., 2010) and narrative analysis of diaries (Midlarsky, 2005, 2006). In addition, quantitative measures of courage, moral courage, social responsibility, and empathy have been used as proxies for heroism (e.g., Heiner, 2018; Franco et al., 2011). As noted in the previous chapter, each of these constructs overlaps with but is distinct from heroism. Their points of overlap provided a starting point for designing a measure of intended heroic action, called the Intended Heroic Behavior Scale (IHBS).

In addition to these measures, an existing qualitative, nominal scale of heroism also shed light on what a scale of intended heroic behavior might entail. When comparing heroes to volunteers, Zimbardo and colleagues (2013) asked laypeople, "Have you ever done something that other people – not necessarily yourself – considered a heroic act or deed?" Participants were asked to categorize the relevant action as helping another person in a dangerous emergency, blowing the whistle, sacrificing on behalf of a nonrelative or stranger, defying unjust authority, or doing something else (other). Participants who selected "other" were prompted to write about their experience so the researchers could determine whether the action qualified as heroic (Zimbardo et al., 2013). Accordingly, this measure yielded different types of heroes (e.g., whistleblowers, civil heroes, etc.). The IHBS includes items designed to capture the full range of heroic behaviors.

A useful guide for the IHBS was also provided by a measure of intended prosocial action. As this measure demonstrates (Baumsteiger & Siegel, 2018), behavioral intentions predict behavior. The theory of planned behavior proposes that people's attitudes, subjective norms, and perceived behavioral control shape their behavioral intentions (Ajzen, 1991). These behavioral intentions, such as the intention to behave heroically, are predictive of actual behavior (Ajzen, 1991). When creating items to measure intended prosocial behavior, Baumsteiger and Siegel (2018) began with items used to measure prosocial behavior. They removed irrelevant items and conducted a factor analysis to determine which items were the most representative of prosocial behavior. Items from this scale served as a useful starting point for items in the present measure of intended heroic behavior.

In addition to this, drawing on an existing measure of moral courage also proved useful. This scale measures intentions to perform acts of moral courage in the workplace (Kastenmüller et al., 2007). Participants read about situations that might require moral courage and responded to two questions. One question asked participants to report on the degree to which they felt ready to act, and a second asked participants to report on the degree to which they believed they would face negative consequences for doing so. The conceptual overlap between heroism and moral courage was evident in this sample item. This scale demonstrated convergent validity by establishing higher correlations with self-reported helping and a scale of prosocial behavior at high risk of negative social consequences than a helping scale, and lower correlations with prosocial behavior at low risk of negative social consequences than a helping scale (Kastenmüller et al., 2007). These types of scenarios, assessing civil or social risk, were included in the IHBS.

Also useful in the construction and validation of the IHBS was an existing scale of moral courage. This scale asked participants how likely they would be to act in a particular situation and how fearful they would be in acting (Woodard & Pury, 2007). Scale items significantly correlated ($p < .01$) with a social desirability scale were deleted, as were items with little to no variation in scores across samples (Woodard & Pury, 2007). Items from this scale that assessed civilian heroism were included in the IHBS. The IHBS also used these examples by assessing the participants' level of risk, examined correlations with social desirability, and examined item variation, to ensure each item had a wide variation in scores.

In short, designing and validating the IHBS relied heavily on existing measures of related constructs. Items were included that appeared to measure civil and social heroism. These measures provided a useful starting point for scale validation processes and item content.

Proposed Hero Scale Parameters

In addition to drawing on existing measures of related constructs, a measure of intended heroic behavior needed to fit particular parameters. For instance, it needed to be designed for young adults, it needed to assess each of the components of heroism, and it needed to assess a wide range of heroic activities. More detail about each of these parameters follows.

Designed for Individuals Aged 18 to 30

This scale of intended heroic behavior could have been designed for use with children, adolescents, or adults. However, for several reasons, it made sense to design the measure for young adults (aged 18–30). While the Carnegie Hero Fund Commission recognizes adolescents and adult civilian heroes throughout the US and Canada, the average age of awarded Carnegie heroes is 22 (Price, 2014). Individuals may be likely to act heroically relatively early in life, and thus it would be important to assess individuals before they reach this age. A scale designed for

use with young adults would enable both cross-sectional and longitudinal analyses. It would also be useful for heroism training programs that typically train adolescents and those in their 20s and 30s. Finally, the forms and contexts of heroism are similar from the age of 18 through adulthood. For many adults heroism may be required at work, on a commute, or in a community, which means the situations or items included in a scale for 18-year-old participants may be understood similarly by 30-year-old participants. For these reasons, I designed the IHBS to assess heroism in 18- to 30-year-old participants. For example, I wrote items with general situations that any young adult might experience. Additionally, I wrote items to be at or below a high school reading level to ensure all young adult participants could read and understand them.

Multidimensional Operationalization of Heroism

A scale quantifying the two critical components of heroism, risk to self and benefit to others, was important for valid research on heroism. Existing measures do not assess both key dimensions. I designed the IHBS items to measure how likely a civilian was to take risky action for the good of others in a range of contexts.

Interval or Ratio Scale

A scale of intended heroic behavior needed to be an interval or ratio scale, to allow the complex analyses needed to examine the relationships and interactions relevant in the development of heroism. While a variable of heroism could be created from interview, archival, or observational data, structural equation modeling and regression analyses require numerous data points on a scale. Without sufficient scale points, these approaches lack the power to reject the null hypotheses and to make accurate estimates of population parameters or effect size (Kelley & Maxwell, 2003). I designed the IHBS to be an interval or ratio scale of intended heroic behavior, to enable the use of these advanced statistical techniques.

Current Study and IHBS Item Generation

To enable the growing field of heroism science to address pressing questions, a scale of intended heroic behavior was needed. The present study was designed to address this need. To create and validate the IHBS, I conducted a series of five studies. I began with a large number of items and narrowed them down in subsequent studies, as recommended in previous research on scale development (Boateng et al., 2018; Clark & Watson, 2016). My goal was to discover the smallest number of scale items that would adequately assess the latent phenomenon of the intention to behave heroically; as such, I made decisions based on creating items and a scale that collected valid data on the intention to act heroically (Boateng et al., 2018; Clifton, 2020). Items were generated using both deductive and inductive methods (Boateng et al., 2018). I used literature on heroism and scales of moral courage (Kastenmüller et al., 2007), the moral courage scale (Woodard & Pury, 2007), the Prosocial Tendencies Measure (Carlo & Randall, 2002), the Heroic Actions Measure (Zimbardo et al., 2013), and the bystander behavior measure (Banyard, 2008) to deduce scale items that might assess social and civil heroism. I also used previously published interviews with heroes and stories from heroes to generate items that include a variety of heroism scenarios, with a focus on their risk to the hero and benefit to others.

The scale items presented statements about intended heroic behaviors and asked participants to indicate how willing they would be to perform each behavior, on a scale ranging from 1 (*definitely would not do this*) to 7 (*definitely would do this*). To increase the ability of the scale to collect valid data, items were designed to have varied wording because similarly worded items tend to hang together (Clifton, 2020). Additionally, the items were crafted with a 7-point Likert-type scale because this allowed for increased variation in responding. The IHBS, before

evaluation, contained 22 civil heroism items and 25 social heroism items, as seen in Tables 1 and 2.

Following creation of the items, I conducted five studies to reduce the number of scale items to the fewest possible number that would generate valid data on intended heroic behavior, and I tested the scale's validity in multiple samples. In Study 1, heroism researchers and other experts examined the items for their content validity. These expert raters, selected from the most frequently published authors in *Heroism Science*, were asked to assess each item to help ensure the items covered the entirety of the content of the construct of intended heroism and nothing else.

In Study 2, I pretested the items with laypeople in the target population to ensure they understood them as intended (Boateng et al., 2018). To assess face validity participants rated the extent to which they perceived each item situation as risky to the actor and beneficial to others. These tests ensured the items covered the most critical aspects of heroism, risk to the hero and benefit to others. Additionally, participants rated the items according to the extent to which they could realistically imagine themselves acting in the various scenarios.

In Study 3, I tested the items in their Likert-style survey form with laypeople to identify the factors and items most representative of social and civil heroism through exploratory factor analysis. Self-report survey measures, especially those involving moral or prosocial behavior items, have been susceptible to socially desirable responses (Fernandes & Randall, 1992; Nederhof, 1985). However, recent research has demonstrated that, compared to in-person surveys or interviews, surveys administered online can yield higher levels of self-disclosure, a greater willingness to answer sensitive questions, and reductions in socially desirable responses (Dayan et al., 2007). Due to this possible response bias, in Study 3 I also examined correlations

between individual IHBS items and participant scores on a social desirability scale. These analyses reduced the scale to 8 total items.

In Study 4, I used a new sample of laypeople and assessed validity by testing the items in a confirmatory factor analysis to ensure the social and civil heroism item subscales discovered in Study 3 assessed distinct aspects of heroism. Following the confirmatory factor analysis, I conducted correlation analyses and t-tests, to ensure the IHBS was related as expected to measures of benefit to others, empathy, social responsibility, prosocial behavior, vitality, and self-reported acts of heroism. As discussed above, empathy, social responsibility, and prosocial behavior are all constructs commonly correlated with heroism (Fagin-Jones & Midlarsky, 2007; Greitemeyer et al., 2007). I hypothesized the IHBS, and subscales would be positively correlated with these measures. Vitality is a person's experience of energy, enthusiasm, and aliveness (Ware & Sherbourne, 1992). There are no empirical or theoretical reasons why heroes would have significantly higher or lower vitality than other people; thus, as a test of discriminant validity I predicted the IHBS would not correlate well with this measure.

Finally, in Study 5, I tested the final version of the IHBS with a group of known heroes and compared their scores to those of nonhero laypeople. I hypothesized that heroes would have significantly higher mean scores on the IHBS scale and subscales. I also assessed convergent validity by conducting correlational analyses to ensure the IHBS was related as expected to measures of moral courage, empathy, and social responsibility. I hypothesized the IHBS would be positively correlated with these constructs. To assess discriminant validity, I compared correlations with a scale of self-efficacy. A recent study concluded that decorated heroes rated self-efficacy as a characteristic they possessed only to an average degree (Riches, 2017). Thus, I

hypothesized the IHBS would be weakly or not at all correlated with this measure of self-efficacy.

Chapter 3: Validity Assessment by Experts and Laypeople

Study 1: Expert Rating of Content Validity

Before laypeople interacted with the 47 potential IHBS items, expert raters evaluated the items' content validity. Expert raters included a sample of the most frequently published authors in *Heroism Science* and practitioners who develop heroism training programs. They were asked to assess each item to help ensure the items covered the entirety of the content of the construct of intended heroism and nothing else.

Participants and Procedures

Frequently cited researchers in *Heroism Science* and practitioners of applied heroism programs ($N = 12$) were contacted via email and asked to participate in a survey examining the content validity of a new scale of intended heroic behavior. Heroism experts (66.67% male, 25.00% female, 8.33% agender; 66.67% White, 25% mixed ethnicity, 8.3% Latinx; M age = 52.67; $SD = 19.44$) were asked to rate how closely each item matched their understanding of heroism. Participants also had the opportunity to share feedback on each item as well as on the scale as a whole.

Measures

Rating of the Intended Heroic Behavior Scale Items. Participants rated how closely each of the 47 items matched their understanding of heroism, on a scale of 1 (*definitely not heroic*) to 7 (d*efinitely heroic*). The items to which experts responded can be found in Tables 1 and 2.

Study 1: Results

Data were analyzed using R version 4.1.0 (R Foundation for Statistical Computing, 2021). I analyzed expert rater scores for agreement to determine if the items fit their definitions

of heroism. To do this, I calculated mean scores, standard deviations, and frequency distributions for each item. Items with higher mean scores indicated the experts agreed these items fit their definition of heroism, and items with lower mean scores indicated experts agreed these items did not fit their definition of heroism. I retained all IHBS items with mean rating scores of 6 or above. Additionally, an item with a standard deviation under 1.00 indicated considerable agreement between the experts on that item's rating, while a standard deviation above 1.00 indicated the experts did not agree on the rating of that item. I examined the open-ended responses for all items with rating score standard deviations over 1.00, as well as items that over 50% of experts rated as less than or equal to 6 out of 7. I revised these items based on open-ended comments or removed them from the scale.

Some examples may clarify this quantitative and qualitative process of analysis. Heroism experts rated the item "Investigate if you were awakened at night by a stranger calling for help" with a mean rating of 5.17 and a standard deviation of 1.53. Additionally, 58% of the experts rated the item as less than or equal to 6 out of 7. While there were not many open-ended comments for this item, the low mean score and percentage of experts who rated it as less than or equal to 6 out of 7 demonstrated experts did not believe this item clearly assessed heroism. This item did not include a clear benefit to others, meaning it did not clearly demonstrate a heroic act. Another item read, "Risk your relationship with friends to actively pursue a cause you believe in." The average expert rating was 5.58, with a standard deviation of 1.16, and 42% of the experts rated the item as less than or equal to 6 out of 7. Experts made comments such as "a cause you believe in is too ambiguous to rank highly" and "the ones that are generic without a context get lower ratings." These responses demonstrated this item was not a clear measure of heroism. A final sample item read, "Speak up against racist jokes." Experts' average rating was

5.83, the standard deviation was 0.94, and 50% of the experts rated the item less than or equal to 6 out of 7. This low mean score led me to investigate and eventually delete the item, because while the item clearly measured moral courage, the benefit to others was not clear. These are only three examples of the eight items deleted, but the other items were deleted for similar reasons. Experts agreed the deleted items did not clearly demonstrate heroism.

Heroism researchers also provided positive comments about the scale as a whole. Experts said things like, "good broad domain of situations and actions relevant to social/political actions relevant to a working definition of Heroism" and "as discrete entities these items all display heroic activities." It was clear from these comments that most of the items fit the experts' definitions of heroism. However, the experts noted a few content areas of heroism that were not adequately covered. Thus, I wrote three new items for the IHBS based on these comments: "Risk your mental health to support others," "Risk trauma to yourself to support someone through trauma," and "Risk your own well-being to support others."

Study 1: Discussion

Previous studies have used measures of moral courage, prosocial behavior, empathy, courage, and altruism as substitutes for measures of heroism (e.g., Greitemeyer et al., 2007; Heiner, 2018; Midlarsky et al., 2005). After I created 47 items intended to measure heroism based on these previous scales and real-life examples of heroism, I invited heroism experts to rate each item based on how closely it matched their understanding of heroism.

To improve the items and ensure they measured heroism I examined 12 experts' average rating scores and comments on each item. I deleted eight items and added three new items. These changes increased the content validity of the IHBS. These 12 experts believed these 42 items fit their definition of heroism. This suggests the items have both face validity, which means the

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items seem to be an appropriate assessment of the target construct (Boateng et al., 2018), and content validity, which means the items are measuring the entire content of the construct of heroism and nothing else (Boateng et al., 2018; Clifton, 2020). These results also suggest the items may measure heroism better than items in previous scales used to measure the construct.

These results were promising; however, these items were intended for use with laypeople rather than heroism experts. It was important that laypeople perceive each item as describing heroic, rather than prosocial or altruistic, behavior. The next step in analyzing these items was to investigate if laypeople agreed these items described heroic actions.

Study 2: Validity Assessment by Laypeople

In Study 2, I tested the 42-item draft of the IHBS to ascertain whether laypeople agreed the items had face validity. The two critical aspects of the definition of heroism are the benefit to others and the risk to the hero. Study 2 investigated the extent to which laypeople rated the items as risky to the actor and beneficial to others. To ensure the various item scenarios were realistic, participants also rated how realistic the scenarios were.

Participants and Procedures

A total of 158 participants were recruited through Amazon's Mechanical Turk (MTurk) using CloudResearch.com, an automation software for management of MTurk studies and participant payment (Litman et al., 2017). Eleven participants were removed from the dataset because they failed attention-check items or were missing more than 50% of their data, leaving a total of 147 participants ($N = 147$; 52.38% male, 43.54% female, 4.08% other gender including agender, gender nonconforming, genderqueer, transgender men, and transgender women; 61.22% White, 12.24% Asian American, 10.20% Black, 8.16% mixed ethnicity, 6.12% Latinx, 1.36% Native North American; M age $= 26.12$; $SD = 2.51$). Due to the simple methodology for analyses

of mean rating scores and percentages, a sample of 147 was sufficient as a pretest of item difficulty, face validity, and content validity (Boateng et al., 2018).

After following an MTurk link, participants completed the following survey on Qualtrics.com. Participants provided informed consent and were presented with all 42 IHBS items listed in Table 2 in random order. Example items include "I would risk my safety to blow the whistle on an injustice" and "I would pull a stranger out of a burning car." Participants were asked three questions about each IHBS item: "How risky would this action be to you?", "How beneficial would this action be to others?", and "How realistic do you think this scenario is?" Attention-check items are useful for ensuring data quality in online surveys (Berinsky et al., 2014). Accordingly, I evaluated each participant's attention level by asking them to "Please select 4 for this item" on one item in the survey. Participants were also asked to share feedback on the scale as a whole. Following these questions, participants completed a short demographic scale and were compensated through MTurk. The survey took an average of 12 minutes to complete.

Measures

Rating the IHBS Items. Participants rated each of the 42 items, as listed in Tables 3 and 4. Three 11-point sliding scales were used to rate the scenario's risk to the actor and its benefit to others. They also rated the degree to which each scenario seemed realistic. Scores of 0 represented *not at all risky*, *not at all beneficial*, and *not at all realistic*, and scores of 10 represented *extremely risky*, *extremely beneficial*, and *extremely realistic*. Participants were also asked to share their feedback on the scale as a whole by inviting them to please leave "additional comments about these situations, questions, or the survey as a whole."

<div align="center">

Study 2: Results

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I analyzed the data to determine whether most respondents agreed the actions presented in the items were risky to the actor, beneficial to others, and realistic. I examined frequency distributions for each item, to ensure a minimum of 50% of the participants rated the risk level, benefit to others, and realism as being greater than or equal to 6 out of 10 on the response scale. I revised or removed items rated as less than 6 out of 10 in response to any one of the three questions: risk, benefit to others, or realism. Data were analyzed using R version 4.1.0 (R Foundation for Statistical Computing, 2021). Ten items were rated by more than 50% of the participants as less than 6 out of 10 in risk to the hero, benefit to others, or realism. I also visually examined the frequency distributions and histograms of these ratings to better understand how participants were responding to the items. These quantitative and qualitative responses gave insight into which items the participants felt best fit the definition of heroism and helped me to exclude items most did not see as heroic behaviors or realistic scenarios.

I deleted 10 items to enhance the survey's content validity. Participants reported these items were too general (e.g., "Risk social consequences to help a stranger"), they did not understand what the risk to the actor might be (e.g., "Sacrifice for a stranger even though you may be at risk"), or they were unclear on who would benefit from the action (e.g., "Risk your job to reveal theft by a supervisor").

Study 2: Discussion

In Study 2, I examined the items' content validity and face validity with laypeople to ensure the items described beneficial and risky behavior in line with the definition of heroism. Finally, I assessed the extent to which laypeople felt they might realistically face the situations presented in the items. If people did not believe the situations were realistic, it would be difficult to report their behavioral intention in that situation.

Of the 42 IHBS items, participants rated 32 as risky to the actor, beneficial to others, and realistic. In other words, these items demonstrated adequate face and content validity. Thirty-two was far too many items for a final scale. Yet it was important not to limit the number of items before conducting an exploratory factor analysis. Doing so would prevent the exploratory factor analysis from broadly exploring the construct, a validity limitation that, according to Clifton (2020), plagues many scales. Including a variety of items laypeople agreed were risky, beneficial to others, and realistic also improved the chances of collecting valid data on the full range of possible heroic activities.

The next step in the scale construction process is item reduction (Boateng et al., 2018; Clark & Watson, 2016; Clifton, 2020). Item reduction requires testing the items with a new sample and conducting exploratory factor analysis. To mitigate the possibility of socially desirable responding, I also examined each item's correlation to social desirability.

Chapter 4: Reducing Items and Extracting Factors

Study 3: Exploratory Factor Analysis

In Study 3, I reduced the number of items in the IHBS while at the same time assessing the entire construct of intended heroism. I conducted an exploratory factor analysis to identify the factors and items most representative of social and civil heroism. To reduce the number of items before exploratory factor analysis, I deleted all IHBS items that were moderately correlated with the social desirability scale, a decision supported by Clifton (2020), who suggests removing items based on their apparent social desirability is a subjective judgment and there are no clear statistical guidelines for removing items susceptible to response bias. I also looked at the average score by item. To ensure items produced both high and low scores, items with little variation in their mean score distribution across the sample, items with high skew, and items with high kurtosis were deleted (Clark & Watson, 2016; Clifton, 2020).

After conducting these analyses, I used exploratory factor analysis to determine how many factors were needed to account for the associations among the items and to help identify which items best represented the latent construct of intended heroism (Flora & Flake, 2017). All items were compared with one another because it was possible some of the items designed to assess civil heroism were better assessments of social heroism or vice versa (Clifton, 2020; Flora & Flake, 2017). While I expected to find two factors that accounted for most of the variance and represented social and civil heroism respectively, I remained open to the possibility that more factors could emerge. I used principal axis factor analysis with direct oblimin rotation (Flora & Flake, 2017) because I hypothesized the resulting factors would be correlated, and direct oblimin rotation is an oblique rotation that allows for, and measures, correlations between factors (Osborne & Costello, 2009; Rattray & Jones, 2007). In examining the factor analysis results, a

common practice has been to remove items with factor loadings less than 0.30. This standard was applied in this case, with the exception that items were not removed if they appeared to assess a specific facet of heroism other items did not, as recommended by Clifton (2020). This may have increased the validity of the measure by ensuring all items that measured the content of heroism remained (Clifton, 2020). I also ensured each subscale had at least three items.

To ensure the items acted as an internally consistent scale, I aimed for a minimum reliability coefficient of 0.70. However, an average interitem correlation higher than 0.50 suggests a scale may have items too similar to one another. When items are too similar, they may be assessing overlapping variance of the latent construct, in this case intended heroism (Piedmont, 2014). I favored retention of factor solutions and items with low interitem correlations to ensure I was assessing the full range of intended heroism. In short, I wanted the items to assess a variety of heroic behaviors and did not want all questions to generate data on only one or two heroic behaviors. I aimed for scales with a minimum reliability coefficient of 0.70, and low interitem correlations (e.g., close to 0.50). Finally, participants tire when completing long surveys, adding systematic error to responses (Porter, 2004). To reduce this possibility, the goal of this study was to reduce the number of items, while still accounting for the most variance and assessing a wide range of heroic behaviors.

Participants and Procedures

Researchers recommend sampling at least 10 participants per item in exploratory factor analysis (Garson, 2008), which I did. This sample also fits the recommendation of Boateng et al. (2018) for a sample between 200 and 400 participants. Participants ($N = 341$; 58.35% female, 38.41% male, 3.23% other gender including bigender, gender nonconforming, genderqueer, and transgender women; 58.65% White, 13.20% Asian American, 12.32% Black, 7.92% mixed

ethnicity, 6.45% Latinx, 0.88% Middle Eastern; *M* age = 25.55; *SD* = 3.19) were recruited from

MTurk.com and directed to a survey posted on Qualtrics.com where they completed the scales

described below and reported demographic information. Each item block in Qualtrics was

limited to three items from a single scale to better randomize the order of the items.

Randomizing these blocks of three items among all scales led to each participant completing

three items on heroism followed by three items on other scales, such as social desirability, at

random. Randomization increased validity by removing some of the systematic error caused

when all participants in a survey complete each item in the same order (Clifton, 2020).

Following the survey, participants were thanked and compensated through MTurk.com.

Management of participant payment and MTurk survey delivery was completed using

CloudResearch.com (Litman et al., 2017).

Measures

      Intended Heroic Behavior. Heroism was measured with the 32-item draft of the IHBS,

which asked participants to imagine encountering situations that called for heroic action and

asked them how likely they were to take the action indicated. For instance, participants were

asked to report on a scale from 1 (*definitely would not do this*) to 7 (*definitely would do this*)

their willingness to "call out unethical behaviors even though doing so would put you at risk"

and "take action to help others even if it meant getting hurt." All items were coded positively,

with higher scores indicating stronger intentions to perform heroic actions.

      Social Desirability. The Communal Management subscale from the Bidimensional

Impression Management Index (BIMI; Blasberg et al., 2014) was used to measure the likelihood

participants were responding in socially desirable ways. Participants were asked to respond to 10

positively coded and reverse-coded items, such as "I never cover up my mistakes" and "I often

drive faster than the speed limit," by indicating how much they *disagreed* or *agreed* with the statements on a 7-point Likert-type scale. This scale had a coefficient alpha of 0.71 (95% confidence interval (CI) [0.66, 0.76]). An attention-check item was also used by asking participants to rate an item as 4.

      Benefit to Others. Participants' eagerness to help others was measured using the beyond-the-self subscale from the Claremont Purpose Scale (Bronk et al., 2018). This four-item subscale measures how focused participants are on building a world for the benefit of others. Participants responded to four questions, an example being "How often do you hope that the work that you do positively influences others?", on a 5-point Likert-type scale from 1 (*almost never*) to 5 (*almost all the time*). This subscale had a coefficient alpha of 0.87 (95% CI [0.85, 0.89]). I hypothesized the IHBS would correlate positively with the beyond-the-self subscale.

Study 3: Results

Item Reduction

      Prior to correlational analysis, I conducted a sensitivity analysis to identify trivial relationships based on the number of participants. Based on the sample size of 341, a power of .90, and an $\alpha = 0.05$, the power analysis determined that correlational analysis should be able to detect a true correlation of $r = .04$ and above. Data were analyzed using R version 4.1.0 (R Foundation for Statistical Computing, 2021). I planned to delete any IHBS items which were moderately correlated with the social desirability scale; however, no IHBS items were correlated with the social desirability scale. In fact, the highest correlation was $r = .13$, $p = .016$, which demonstrated a trivial relationship with one item.

      Next, I analyzed items for their difficulty, with a view toward retaining items that captured high scorers and low scorers. To do this, I examined item means, standard deviations,

skew, and kurtosis. Items with skew and kurtosis above 1.00 were removed. I also examined item

histograms to investigate whether items elicited responses in reasonably normal distributions.

Additionally, I examined frequency and relative frequency distributions of item responses, to

ensure at least 50% of the participants responded to the item with a rating of less than or equal to

5 out of a possible 7. This helped ensure the scale was not full of items describing situations in

which most participants claimed they would act heroically. Based on these analyses, two items

were deleted from the scale. Finally, I examined participants' open-ended comments to determine

if any items were misunderstood, disliked, or otherwise problematic, and I removed two items

based on these open-ended responses. After these item reduction analyses, the IHBS was left

with 28 total items before exploratory factor analysis.

Exploratory Factor Analysis

I followed the recommendations made by Clifton (2020) for item and factor retention.

Correlation testing revealed the IHBS items were significantly correlated with one another

(correlations ranged from $r = .26$ to $r = .87$, $p < .01$). Following these tests of assumptions, I used

principal axis factor analysis with direct oblimin rotation, as recommended by Flora and Flake

(2017). To determine how many factors to retain, I examined the scree plot, variance explained

by each factor, and the pattern of factor loadings (Boateng et al., 2018). I considered all factors

with eigenvalues over 1.0 (Kaiser, 1960) and attempted to reduce the dimensions to the fewest

number of factors that would account for the largest proportion of variance. Items with factor

loadings of 0.40 and above were retained (Boateng et al., 2018). I removed items at this

exploratory stage, with the goal of improving item independence and diversity of difficulty. I

accomplished this by retaining items with the lowest average interitem correlations, to help

ensure the items correlated with the latent variable of heroism more than with other items

(Clifton, 2020). Additionally, in all these explorations, the factors and subscales had a minimum of three items (Clifton, 2020). I examined subscales for Cronbach's alphas between .70 and .95, to help ensure diversity of the items (Clark & Watson, 2016; Clifton, 2020).

Factor analysis suggested a four-factor, three-factor, and two-factor solution based on eigenvalues above 1.0 (Kaiser rule) and the scree analysis. The four-factor solution made conceptual sense. One set of items loading onto a factor assessing civil heroism, another onto a factor assessing social heroism, another smaller set of items loaded onto a factor measuring risk to well-being, mental health, or trauma, and a fourth smaller set of items loaded onto a factor measuring workplace-specific risk. However, the small workplace heroism factor had several items cross loading with the social heroism factor, and the well-being factor had multiple items cross loading with the civil heroism factor. This suggested the further collapsed two-factor solution might be more appropriate. Based on these analyses, I selected the two-factor solution. The full 28-item scale loaded onto two distinct factors (Kaiser-Meyer-Olkin [KMO] = 0.96, Root Mean Squared Error of Approximation [RMSEA] = .05, Tucker Lewis Index [TLI] = 0.84), I called civil heroism (16 items), and social heroism (12 items). This factor solution accounted for 65% of the total variance. As expected, the factors were correlated at $r = .65$. This 28-item version of the scale demonstrated internal consistency ($\alpha = .97$; M interitem correlation $r = .54$), as did the individual subscales: civil ($\alpha = .96$; M interitem correlation $r = .62$), and social ($\alpha = .96$; M interitem correlation $r = .65$).

While this two-factor solution was the clearest solution with the least cross loading it was also a large scale, and items were similar, demonstrated by multiple correlations over $r = .80$ between items, high Cronbach's alphas, and high mean interitem correlations. I reduced the scale

to the fewest possible items to assess the breadth of the heroism construct to improve validity and reduce the similarity between items.

First, I randomly selected and tested several 3-item subscales of civil and social heroism. In exploring these results, I determined reducing the scale to three items did not cover the breadth of the civil or social heroism constructs, because it eliminated unique items that clearly focused on social and civil heroism, or it eliminated items concerning well-being and workplace risks. To increase the content adequacy of these subscales, and potentially increase content validity, I systematically tested 4-, 5-, and 6-item subscales.

To find the sets of four, five, or six items that would be the most appropriate, I explored three sets of 4-item, 5-item, and 6-item subscales whose items were selected at random. In addition to examining Cronbach's alpha, I focused on mean interitem correlations below $r = .61$. A cutoff of .61 was more liberal than Piedmont's (2014) recommendation but allowed me to find and test subscales whose items covered the diversity of the constructs of social and civil heroism, without being too similar. In examining these randomly generated scales, I found some were psychometrically adequate.

While some randomly generated civil and social subscales were satisfactory, random selection led to versions of the subscales focused on only one of the dimensions of civil or social heroism. With a focus on content validity, I intentionally crafted 4-, 5-, and 6-item subscales of civil and social heroism by selecting the individual items that appeared to have face validity and might assess the dimensions of risk and benefit in civil and social heroism situations. I included items that covered well-being heroism, workplace heroism, and desire to benefit social/political movements, because the earlier factor analysis suggested these may be unique aspects of the

variance. Additionally, to help ensure the items were assessing separate elements of heroism, I selected items not correlated with one another above $r = .80$.

While many tested drafts of the scale resulted in high mean interitem correlations, I discovered some 4- and 5-item subscales had high internal consistency and lower mean interitem correlations, which indicated those items might have assessed distinct aspects of civil or social heroism. In short, items were selected to have high validity rather than high internal consistency (Clifton, 2020). I selected the best performing scale, which contained eight total items and loaded onto two distinct factors (KMO = 0.88, RMSEA = .09, TLI = 0.94). This scale included four civil heroism items and four social heroism items. This factor solution accounted for 58.16% of the total variance. As expected, the factors were highly correlated $r = .74$. This 8-item version of the IHBS demonstrated internal consistency ($\alpha = .88$, 95% CI [0.86, 0.90], M interitem correlation $r = .49$), as did the individual subscales: civil ($\alpha = .83$, 95% CI [0.79, 0.85], M interitem correlation $r = .56$) and social ($\alpha = .84$, 95% CI [0.81, 0.86], M interitem correlation $r = .57$). The factor loadings for these items are shown in table 5.

Discriminant and Convergent Validity

As an assessment of discriminant validity, I examined the correlations between the IHBS and the social desirability scale (BIMI; Blasberg et al., 2014). The full 8-item scale ($r = .04$, $p = .418$) was not correlated with social desirability to any meaningful degree, and neither were the civil ($r = .03$, $p = .638$) or social subscales ($r = .05$, $p = .327$).

Additionally, as a check of convergent validity, I hypothesized the IHBS would be positively correlated with beyond-the-self concerns (Bronk et al., 2018). My hypothesis was supported: This 8-item draft of the IHBS ($r = .44$, $p < .001$), as well as the civil ($r = .41$, p

< .001) and social subscales ($r = .39$, $p < .001$), were positively correlated with beyond-the-self concerns.

Study 3: Discussion

Using the analyses of the scale items in Study 3, I was able to reduce the IHBS to eight total items that appeared to generate valid data on intended heroic behavior. This is relevant because previous scales used as assessments of heroism have contained between 12 and 23 items, which could increase participants' mental fatigue (Porter, 2004). Further, previous measures have assessed correlated constructs, such as moral courage, altruism, empathy, or social responsibility (e.g., Greitemeyer et al., 2007; Heiner, 2018; Midlarsky et al., 2005). An 8-item scale of intended heroic behavior would enable researchers to use a shorter scale that measures the primary construct of interest.

Item reduction using these analyses helped ensure the scale contained a variety of items people might respond to in different ways, with some participants scoring low and some participants scoring high on any given item, which may have increased the possibility of generating valid data on heroism. I selected final scale items with high alphas but low mean interitem correlations, because this should ensure the scale is assessing the distinct elements of civil and social heroism with fewer items (Clifton, 2020; Piedmont, 2014). Additionally, these results indicated the scale may perform well as a single bifactor scale or as a second-order factor scale, where intended heroic behavior is measured by the civil and social heroism subscales. However, a confirmatory factor analysis was needed to test these hypothesized factor structures.

Correlational analyses determined there were no correlations with social desirability. This suggested that while some participants in the sample may have been responding in socially desirable ways, none of the IHBS items, nor the final scale, was moderately or strongly

correlated with socially desirable responding. The lack of correlations with social desirability suggests the discriminant validity of the IHBS is good.

As hypothesized, the positive correlations between the IHBS and the beyond-the-self subscale suggested that participants who scored high on intended heroic behavior may be more concerned with others' well-being. In short, the positive correlation between the IHBS and beyond-the-self concerns supported the convergent validity of the scale. While this finding provided initial evidence of the validity of the IHBS, additional studies were required to demonstrate the IHBS provides valid data on heroism. Studies 4 and 5 were conducted in new samples to confirm these results and further test convergent and divergent validity.

Limitations

One limitation of Study 3 was too few items measuring well-being heroism or workplace heroism to make a clear 3-item subscale of either construct. The three- and four-factor exploratory factor analysis solutions indicated participants were responding to the well-being heroism and workplace heroism items differently than they were responding to the other civil and social heroism items. This indicates well-being heroism and workplace heroism may be separate constructs that may require additional items to fully explore them in the future. Alternatively, the results of the two-factor solution collapsing well-being items into the civil subscale, and workplace items into the social subscale suggest well-being and workplace heroism may indeed be components of civil and social heroism. Future researchers may wish to examine if risks to well-being, or workplace-specific risks, are distinct enough to be categorized as separate forms of heroism.

While results of the present study were promising, they were limited to a single study. Further studies were required to confirm the factor structure and to test additional variables hypothesized to be correlated with heroism.

Future Directions

This 8-item scale of intended heroic behavior performed the best of the variations tested in this sample. This 8-item draft of the scale had the clearest factor structure, and it appeared to have good content, discriminant, and convergent validity. Study 4 was conducted with a new sample to assess additional measures of validity, and test a confirmatory factor model, to discover whether a bifactor model or higher-order factor model offers a more appropriate explanation for the data.

Chapter 5: Testing Dimensionality and Validity

Study 4: Confirmatory Factor Analysis

Study four was designed to determine if the IHBS items were generating valid data on intended heroic behavior. To do this, I conducted a confirmatory factor analysis. My aim was to ensure the social and civil heroism item subscales that emerged from Study 3 assessed distinct aspects of heroism. I used structural equation modeling to investigate the factor structure of the IHBS. Confirmatory factor analysis requires a new sample (Flora & Flake, 2017), and the findings in Study 3 suggested the IHBS might be best explained by a bifactor model or a higher-order factor model. Study 4 sought to confirm which model best fit the data.

Higher-order and bifactor models are both attempts to model the relationship between items, subscales, and their factors (Reise et al., 2010). A higher-order, factor model assumes a second-order latent variable is made up of the common variance between what more basic latent variables – described as subscales – have in common, rather than what the individual scale items have in common (Chen et al., 2006; Reise et al., 2010). In this case, the IHBS may measure the higher-order latent variable heroism, and the subscales represent civil and social heroism, as in the model illustrated in Figure 2. In this higher-order model, there are no direct relationships between general heroism and the individual scale items. Items in subscales are often correlated, so the analysis of higher-order models demonstrates if the civil and social subscales are well defined and may be scored individually.

A bifactor model is comprised of a single general latent variable, in this case intended heroism, that explains variance common across the individual *items*, after this variance is accounted for there are *additional* group traits of civil and social heroism explaining additional common variance by the subscales (Reise et al., 2010). The bifactor model of the IHBS is shown

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in Figure 3. Both higher-order and bifactor models might be appropriate for understanding multidimensionality, depending on the scale and theoretical construct (Chen et al., 2006; Reise et al., 2010). Bifactor analysis might demonstrate items in the civil and social heroism subscales fit better under a general factor of heroism. If this were the case, the results would indicate the items measure intended heroism generally, and the subscales were not a useful measurement beyond their assessment of the general factor (Chen et al., 2006; Dunn & McCray, 2020; Gomez et al., 2015; Morgan et al., 2015).

Consequently, I tested whether the IHBS was better explained by a higher-order factor model or a bifactor model. Previous work on heroism suggests a higher-order model might be more appropriate, with the heroism subscales assessing different types of heroic actions. However, a bifactor model where all items assess intention to behave heroically before any subscales might be most appropriate because all the items were designed to measure intended heroism. If a higher-order factor model were more appropriate, this would suggest the subscales may be used individually to predict social and civil heroism rather than intended heroism more generally. By contrast, if the bifactor model proved a more appropriate fit for the data, it would be most appropriate to consider all the items predicting intended heroism as a general concept, and not an appropriate measure of civil and social heroism separately. Alternative models, including a single general factor model and correlated two-factor model, were also tested for model fit to ensure the hypothesized models were the most accurate depiction of the data. A single general factor model demonstrates a single general factor structure where all items load onto a single heroism factor. The correlated two-factor model demonstrates a correlated two-factor structure which contains only the latent variables of civil and social heroism. While the correlated two-factor model and higher-order model are mathematically identical in the analysis

of model fit statistics, the differences between factor loadings of the latent variables may illustrate how to conceptualize the final IHBS.

Following the confirmatory factor analysis, I also conducted correlational analyses and t-tests, to ensure the IHBS was related as expected to measures of benefit to others, empathy, social responsibility, prosocial behavior, vitality, and self-reported acts of heroism.

Participants

Based on sample size recommendations from Boateng et al. (2018), Jackson (2003), and Kline (2015), and because I tested relatively simple models with few parameters, I used a sample of 317 adult MTurk workers ($N = 317$; 51.58% female, 45.89% male, 2.53% other gender including agender, gender nonconforming, genderqueer, transgender men, and transgender women; 65.71% White, 12.70% Asian American, 10.79% Black, 6.03% Latinx, 3.17% mixed ethnicity, 0.63% Middle Eastern, 0.32% Native Hawaiian or Pacific Islander, 0.32% Native North American; M age = 25.36; $SD = 3.19$).

Procedures

Participants were recruited from MTurk.com and directed to a survey posted on Qualtrics.com. They completed the scales described below and reported demographic information. Each set of questions in Qualtrics was limited to three items to better randomize the order of the items. Following the survey, participants were compensated through MTurk.com. Management of participant payment and MTurk survey delivery was done using CloudResearch.com (Litman et al., 2017).

Measures

Intended Heroic Behavior. Heroism was measured with the 8-item version of the IHBS shown in Table 6. Items were used as described in Study 3, with possible responses on a scale

from 1 (*definitely would not do this*) to 7 (*definitely would do this*). This scale had a coefficient alpha of 0.89 (95% CI [0.88, 0.91]), while the civil heroism subscale had a coefficient alpha of 0.86 (95% CI [0.83, 0.88]), and the social subscale had a coefficient alpha of 0.84 (95% CI [0.81, 0.87]) in this study.

   Purpose in Life. Participant's purpose in life scores and their desire to benefit others were measured using the Claremont Purpose Scale and beyond-the-self subscale items respectively. The 12-item Claremont Purpose Scale (Bronk et al., 2018) measures the degree to which participants have a sense of personal meaning, are goal oriented, and have personally meaningful goals that are focused beyond-the-self. The four-item beyond-the-self subscale, described in Study 3, measures the degree to which participants are inspired to contribute to the world beyond the self. I predicted the IHBS would be positively correlated with the Claremont Purpose Scale as well as the beyond-the-self subscale. The Claremont Purpose Scale had a coefficient alpha of 0.92 (95% CI [0.90, 0.93]), while the beyond-the-self subscale had a coefficient alpha of 0.87 (95% CI [0.84, 0.89]).

   Heroic Actions. Participants reported potentially heroic actions using an item first used by Zimbardo et al. (2013). Participants were asked, "Have you ever done something that other people, not necessarily you yourself, considered a heroic act or deed?" Participants were provided examples that might spark their memory: "Helping another person in a dangerous emergency; blowing the whistle on an injustice with awareness of the personal risk or threat to yourself; sacrificing on behalf of a nonrelative or stranger; defying unjust authority; or other similar action?" Participants who responded in the affirmative were prompted to "Please describe the situation and your actions below." I coded these open-ended responses, to distinguish between actions that fit the definition of heroism and those that did not. This produced two

variables, one nominal variable where participants either reported a potentially heroic act or failed to report a heroic act, and a second nominal variable indicating actions that either fit the definition of heroism or did not fit the definition of heroism.

Empathy. Empathy has been one of the most common positively correlated characteristics of decorated heroes (Fagin-Jones & Midlarsky, 2007; Midlarsky et al., 2005; Osswald et al., 2004). Empathy was assessed using the 7-item Empathic Concern subscale of the Davis Empathy Scale (Davis, 1983). This scale assesses the concern people feel for others, using questions such as "I often have tender, concerned feelings for people less fortunate than me," and "I am often quite touched by things that I see happen." Participants responded on a 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). This scale had a coefficient alpha of 0.88 (95% CI [0.86, 0.90]). I predicted the IHBS would be positively correlated with the Empathic Concern subscale.

Social Responsibility. Social responsibility has been another commonly correlated characteristic of decorated heroes (Greitemeyer et al., 2007; Midlarsky et al., 2005, 2006). Social responsibility was measured using the relevant subscale of the Personal and Social Responsibility Behaviors Scale (PSRB-S; Filiz & Demirhan, 2018). This scale asks participants to respond to 7 statements on a 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). This scale had a coefficient alpha of 0.83 (95% CI [0.80, 0.86]). I predicted the IHBS would be positively correlated with the PSRB-S.

Vitality. Vitality is a person's experience of energy, enthusiasm, and aliveness (Ware & Sherbourne, 1992). A measure of vitality was used to test the discriminant validity of the IHBS. There are not empirical or theoretical reasons to expect intended heroic behavior to be related to vitality, so I expected to find the two measures were unrelated. Participants responded to the SF-

36 Vitality Scale, which contains four questions asking participants to report on the amount of time over the past month they felt "full of pep" or they had "a lot of energy" (Ware & Sherbourne, 1992). Participants responded on a 6-point Likert-type scale from 1 (*none of the time*) to 6 (*all of the time*). This scale had a coefficient alpha of 0.86 (95% CI [0.83, 0.88]).

Prosocial Behavior. Intentions to act prosocially were measured with the Prosocial Behavioral Intentions Scale (Baumsteiger & Siegel, 2018). This four-item measure assesses the likelihood participants will act prosocially by asking them to respond to a few general situations involving prosocial behavior. Sample items ask participants to report on the likelihood they will "Help care for a sick friend or relative." Response anchors range from 1 (*definitely would not do this*) to 7 (*definitely would do this*). This scale had a coefficient alpha of 0.80 (95% CI [0.76, 0.84]). I predicted the IHBS would be positively correlated with the Prosocial Behavioral Intentions Scale.

Study 4: Results

Confirmatory Factor Analysis

To confirm the factor structure of the IHBS, a confirmatory factor analysis was conducted to ensure the scale was analyzing intended heroic behavior. Based on conceptions of the civil and social heroism scales, as well as the results from the exploratory factor analysis in Study 3, I hypothesized the IHBS items would best fit a higher-order factor model or a bifactor model.

Data were analyzed using R version 4.1.0 (R Foundation for Statistical Computing, 2021), and I used structural equation modeling to test these models with the *lavaan* package in R (Rosseel, 2012). Test statistics, parameter estimates, and standard errors were calculated using maximum likelihood estimation. The individual items in this 7-point Likert-type scale showed

reasonably normal distributions. Consequently, it was appropriate to assume the items were generating interval data.

Fit indices were evaluated based on the recommendations of Hu and Bentler (1995, 1998), and Boeteng et al. (2018). I examined the χ2 test, which is an assessment of model fit; the root mean square of error from approximation (RMSEA) to assess the lack of model fit; the comparative fit index (CFI), which compares this model to a baseline model; the Tucker–Lewis index (TLI), which compares this model to a model with no relationships between items; the incremental fit index (IFI), which is relatively unaffected by sample size; and the standardized root mean square residual (SRMR) statistic, which is a measure of the overall difference between observed and predicted correlations. I also examine the Akaike information criterion (AIC), Bayesian information criterion (BIC), and the sample size adjusted Bayesian information criterion (ADJ BIC), which are comparative fit statistics used to compare model fit and aid model selection when choosing between models, lower scores on these statistics indicate a better fitting model (Kuha, 2004). When evaluating model fit, I made no model modifications based on recommendations by Clifton (2020) and Flora and Flake (2017) who point out that model revisions may capitalize on chance relationships in the sample, and often do not make conceptual sense.

As can be seen in Table 7, the single general factor model, did not indicate good fit based on any of the measures of model fit. The bifactor model, demonstrated the best model fit based on each of the fit indices, including a nonsignificant chi-square and the lowest RMSEA and SRMR scores. It also had the highest CFI, TLI, and IFI, and the lowest AIC, BIC, and ADJ BIC of the models examined. A visual path diagram of these relationships is illustrated in Figure 3.

While the bifactor model demonstrated the best fit, both the correlated two-factor model, and the higher-order factor model, also demonstrated good fit. The fit indices are displayed in Table 7. The two factors were mathematically similar, and the visual models, seen in Figures 1 and 2, help clarify the difference between them. The fit indices, especially the AIC, BIC, and ADJ BIC suggested the bifactor model was the best model representing the IHBS items.

Discriminant and Convergent Validity

Results of correlation analyses in the adult sample supported my hypotheses. The IHBS was positively correlated with empathy $r = .42$, $p < .001$, social responsibility, $r = .49$, $p < .001$, prosocial behavior $r = .51$, $p < .001$, beyond-the-self concerns $r = .44$, $p < .001$, and purpose in life as measured by the Claremont Purpose Scale $r = .38$, $p < .001$. Finally, the IHBS was not correlated with vitality $r = .08$, $p = .184$.

Group Differences

To ensure the IHBS was generating valid data on intended heroic behavior, I used between-groups t-tests to compare the 126 participants who reported a heroic action with those ($n = 191$) who did not report heroic action. Between-groups t-tests revealed significant differences between the group who did not report heroic behavior ($M = 4.26$, $SD = 1.10$) and those who did report heroic behavior ($M = 5.03$, $SD = 1.11$, $t(265) = 6.05$, $p < .001$, $d = 0.70$, 95% confidence interval (CI) [0.46, 0.93]). I also analyzed the open-ended reports participants gave of their heroic behavior. I found 41 participants whose reported actions fit the definition of heroism. Using a between-groups t-test, I found a significant difference between the participants who engaged in heroic acts ($n = 41$; $M = 5.39$, $SD = 1.02$) and those who did not or whose reports did not fit the definition of heroic acts ($n = 276$; $M = 4.45$, $SD = 1.14$, $t(55) = 5.47$, p

$< .001$, $d = 0.85$, 95% CI [0.51, 1.18]). A graphical comparison of these scores is shown in Figure 4.

Study 4: Discussion

The results of Study 4 confirmed the findings of the Study 3 exploratory factor analysis. The 8-item draft of the IHBS clearly fit the bifactor model. The resulting model included all the items assessing the general factor of heroism along with two independent heroism factors which I called civil and social heroism. Study 4 also replicated the positive correlation between the IHBS and beyond-the-self concerns. Vitality and the IHBS were found to be uncorrelated, which indicated evidence of the measure's discriminant validity. The IHBS was positively correlated with purpose, empathy, social responsibility, and prosocial behavior, all measures that have been commonly correlated with, and used as stand-ins for, measures of heroism in the past; these findings provided evidence of the measure's convergent validity (Midlarsky et al., 2005). Finally, Study 4 presented evidence the IHBS distinguished between heroes and nonheroes, demonstrating construct validity. These findings suggest this 8-item measure is a useful tool for generating valid data on intended heroic behavior.

Limitations and Future Directions

Study 4 was conducted to confirm the factor structure of the IHBS. The bifactor model demonstrated the best fit, suggesting the best explanation of the data was the items first represented a general factor of intended heroism, and second, represented two independent factors, civil and social heroism. However, the loadings of the civil items suggested that after accounting for the variance of the general factor of intended heroic behavior, some of the items did not explain a significant portion of new variance for civil heroism, whereas the social heroism items did have significant loadings on the social heroism factor after they accounted for

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the variance of the general factor. In short, the IHBS subscales may be a valid measure of the intended heroism construct when used together, but the subscales may not be useful measures of the individual civil and social constructs. This phenomenon is often seen in bifactor models of multidimensional scales (Chen et al., 2006; Gomez et al., 2015; Morgan et al., 2015). The implications are that at the IHBS may be used as a measure of heroism generally, but these studies did not provide sufficient evidence to suggest the subscales should be used as separate measures of civil or social heroism. In addition to testing the factor structure, future research should test these subscales to determine if they generate valid data on social and civil heroism.

The fact that I was the exclusive coder for the heroic actions measure represents a potential validity limitation. With only one coder, the potential for bias exists. I could have been more liberal or conservative in including or excluding participants in the group who completed heroic actions. I critically examined these open-ended responses to include participants who fit the strict definition of heroism; I excluded participants who described actions that were not risky, or actions that benefited themselves or relatives. However, future research using this open-ended report of heroic actions should utilize additional coders to demonstrate inter-rater reliability and improve validity.

Finally, the number of participants who engaged in heroism was small. While this sample of 41 heroes was larger than expected from an initial pool of 317 participants, it was still a relatively small sample to test. Even so, the IHBS uncovered a statistically significant difference between the groups, with a Cohen's *d* indicating a medium to large effect size for both the group who reported heroism and, more importantly, the group whose descriptions fit the definition of heroism. Although it was impressive that the IHBS was able to distinguish between heroes and nonheroes, demonstrating evidence of the scale's construct validity, a sample of 41

heroes is too small to draw generalizable conclusions. To ensure the IHBS generates valid data on intended heroic behavior, a larger sample of heroes and nonheroes is required. Heroes could be sampled from the general population, using an approach similar to that taken in this study. However, with the relatively small number of heroes in the general population, it would also be wise to include decorated heroes in the sample. Study 5 was conducted to collect a sample of decorated heroes and a larger sample from the general population to confirm this finding.

Chapter 6: Known Groups of Heroes and Validity

Study 5: Known Groups and Validity

After finding the IHBS accurately distinguished between heroes and nonheroes in a small sample, I gathered a larger sample of laypeople and decorated heroes. The aim was to replicate this finding with a larger, more diverse, and more generalizable sample. Such a test was required to conclusively determine if the IHBS generated valid data on intended heroic behavior. I conducted t-tests to examine if decorated heroes and participants who reported heroic action had significantly higher scores on the IHBS than participants who did not report heroic behavior. I hypothesized heroes would have significantly higher scores on the IHBS and subscales. I also assessed convergent validity by conducting correlational analyses to ensure the IHBS was related as expected to measures of moral courage, empathy, and social responsibility. I hypothesized heroism would be positively correlated with these constructs. To assess discriminant validity, I compared correlations with a scale of self-efficacy. In a study by Riches (2017), decorated heroes ranked self-efficacy as a characteristic they possessed to only an average extent. I hypothesized the IHBS would be weakly correlated or uncorrelated with this measure of self-efficacy.

Participants and Procedures

I recruited 14 decorated heroes from organizations that recognize heroes across North America. These organizations include the Carnegie Hero Fund Commission, which awards the Carnegie Medal to civil heroes. I recruited social heroes from the Giraffe Heroes Project; HazingPrevention.org, which awards the Hank Nuwer Anti-Hazing Hero Award; and the Robert F. Kennedy Center for Justice and Human Rights, which awards the Robert F. Kennedy Human Rights Award. I requested and received the heroes' contact information from these organizations, and I contacted them directly by email. Decorated heroes were invited to participate in the study

using a link to the Qualtrics survey where they completed the scales described below, however the decorated heroes did not complete the heroic actions report item. After completion of the study, I provided the decorated heroes with an Amazon gift card by email.

Heroes are a difficult group to sample, as evidenced by the small sample in Study 4, so in addition to including decorated heroes, I also recruited a sample of 677 adult participants through MTurk. Based on the discovery in Study 4 that about 13% of the sample had taken heroic action, I hypothesized that, by gathering a large enough sample of laypeople, over 10% of them would have taken heroic action. Additionally, collecting this large sample of laypeople allowed me to obtain a sample of heroes and nonheroes who should be demographically similar, to compare people who had taken heroic action to those who had not. MTurk workers were invited to a survey posted on Qualtrics.com, where they completed the scales described below. Following the survey, they were compensated through MTurk.com. The total merged sample consisted of 691 adults ($N = 691$; 55.28% male, 42.84% female, 1.89% other gender including bigender, genderqueer, transgender men, transgender women, and other; 78.29% White, 7.81% Black, 5.93% Asian American, 4.49% Latinx, 1.88% mixed ethnicity, and 1.59% other ethnicities including Middle Eastern, Alaska Native, and Native North American; M age = 41.53; $SD =$ 11.42). Of these 691 participants, 109 fit the definition of a hero. The remaining 582 did not. Management of participant payment and MTurk survey delivery was done using CloudResearch.com (Litman et al., 2017).

Measures

Intended Heroic Behavior. Heroism was measured with the final 8-item version of the IHBS. Items were used as described in Study 3, with possible responses on a scale from 1 (*definitely would not do this*) to 7 (*definitely would do this*). The coefficient alpha of the IHBS

was 0.91 (95% CI [0.90, 0.92]), while the civil subscale was 0.86 (95% CI [0.84, 0.88]), and the social subscale was 0.86 (95% CI [0.84, 0.88]) in this study.

Moral Courage. Moral courage scales have commonly been used as a stand-in for heroism scales (Osswald et al., 2004; Walker & Frimer, 2007). Moral courage was measured with the 23-item Woodard Pury Courage Scale (2007). I asked participants to read scenarios where they might have to act with courage and respond on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) whether they would act. This scale had a coefficient alpha of 0.89 (95% CI [0.88, 0.90]). The initial validation of this scale also used a response option which asked the participant to rate the fear they would feel in that situation. However, later research by Woodard (2010) demonstrated this fear rating was not an essential component of the definition of courage, and fear ratings were removed from the scale. Therefore, I did not include the fear rating in this study.

Empathy. Empathy was assessed using the 7-item Empathic Concern subscale of the Davis Empathy Scale (Davis, 1983), as described in Study 4, with possible responses on a 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The coefficient alpha in this study was 0.93 (95% CI [0.92, 0.93]).

Social Responsibility. Social responsibility was measured using the relevant subscale of the PSRB-S (Filiz & Demirhan, 2018), as discussed in Study 4, with possible responses on a 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The coefficient alpha in this study was 0.87 (95% CI [0.85, 0.88]).

Self-Efficacy. Self-efficacy is a person's belief in their "capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands" (Chen et al., 2001 p. 62). Participants responded to the New General Self-Efficacy Scale (Chen

et al., 2001), which contains eight items, such as "I believe I can succeed at most any endeavor to which I set my mind," on a 7-point Likert-type type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). This scale had a coefficient alpha of 0.96 (95% CI [0.95, 0.96]).

Heroic Actions. MTurk participants reported on actions they had taken that others might consider heroic, using the item described in Study 4. Participants who reported they had taken heroic action were asked to describe their actions. I coded these open-ended responses to identify actions that fit the definition of heroism. This produced two variables, one nominal variable where participants either reported heroism or did not report heroism, and a second nominal variable indicating actions were heroic or did not fit the definition of heroism.

Quality Check. Participants who indicated they had not acted heroically were asked, "In one or two sentences, will you please tell me what a hero is to you?" This question was intended to help check the quality of the data provided by participants. While attention-check items can often flag responses given by computer programs or inattentive participants (Hauser & Schwarz, 2015), participants may also "straightline" responses by selecting the same response choice for all items, without taking care to consider and respond to questions (Liu & Cernat, 2018). One way to reduce this possibility is to avoid matrix response options in favor of item-by-item questions, which all these studies did (Liu & Cernat, 2018; Tourangeau et al., 2004). Another way to detect inattention is to ask open-ended questions and analyze the responses (Ziegler, 2022). I examined open-ended responses from decorated heroes and laypeople to determine if any were irrelevant to the question. I deleted participants from the data pool who responded in irrelevant ways. Attention-check items were also used to help catch inattentive participants or computer programs. These quality checks led to a total of 24 participants being deleted from the sample before analyses were conducted with the final sample of 691 participants.

Study 5: Results

Discriminant and Convergent Validity

As a final test of convergent and discriminant validity, I analyzed correlations between the IHBS and scales of empathy, social responsibility, moral courage, and self-efficacy to ensure the IHBS related to these scales as expected. Data were analyzed using R version 4.1.0 (R Foundation for Statistical Computing, 2021). Results supported my hypotheses concerning convergent validity. The IHBS was positively correlated with empathy $r = .40$, $p < .001$, social responsibility $r = .46$, $p < .001$, and moral courage $r = .79$, $p < .001$. However, the IHBS was positively correlated with self-efficacy $r = .31$, $p < .001$, which did not provide evidence of discriminant validity.

Group Differences

As a final test to ensure the IHBS generated valid data on intended heroic action, between-groups t-tests were conducted. These tests compared participants ($n = 194$) who reported they had acted heroically with participants ($n = 497$) who did not report heroic action. Between-groups t-tests revealed significant differences between the group whose members did not report heroism ($M = 4.24$, $SD = 1.25$) and the group whose members did report heroism ($M = 5.28$, $SD = 1.02$, $t(429) = 11.28$, $p < .001$, $d = 0.87$, 95% CI [0.70, 1.04]). Some of these participants reported having acted heroically while the actions they described were clearly prosocial or altruistic. After analyzing participant reports, I found 109 participants whose reported actions fit the definition of heroism. A between-groups t-test found a significant difference between the participants who engaged in heroism ($n = 109$; $M = 5.45$, $SD = 1.05$) and those who did not report heroism or whose reports did not fit the definition of heroism ($n = 582$;

M = 4.36, *SD* = 1.24, *t*(169) = 9.62, *p* < .001, *d* =0.90, 95% CI [0.69, 1.11]). A graphical

comparison of these scores is shown in Figure 4.

To examine the construct validity of the IHBS civil and social subscales, I compared

mean scores on the subscales between the group of heroes who had performed civil heroism (*n* =

61) and the group of heroes who had performed social heroism (*n* = 43). Using a between-groups

t-test, I found a significant difference between the civil (*M* = 5.76, *SD* = 1.10) and social heroes

(*M* = 5.22, *SD* = 1.10) on the IHBS civil subscale (*t*(90) = 2.48, *p* = .015, *d* = 0.50 95% CI [0.09,

0.90]). I found no significant difference between the civil (*M* = 5.31, *SD* = 1.12) and social

heroes (*M* = 5.42, *SD* = 1.17) on the IHBS social subscale (*t*(88) = 0.51, *p* = .611, *d* = 0.10, 95%

CI [-0.29, 0.49]).

Study 5: Discussion

Study 5 replicated the findings of Study 4 and provided additional evidence of the

IHBS's construct, and convergent validity in a larger sample. The IHBS was positively correlated

with empathy, social responsibility, and moral courage as hypothesized, demonstrating

convergent validity. In the past, decorated heroes reported self-efficacy was not one of their

defining characteristics (Riches, 2017). In this study, there was a positive correlation found

between the IHBS and self-efficacy. Heroes have acted heroically in situations where others did

not; presumably, in those situations, the heroes may have felt higher self-efficacy than

bystanders. While heroes reported that self-efficacy was not one of their defining characteristics,

these results may indicate that heroes may have slightly higher self-efficacy than the average

person, but not to such a great degree that it would be ranked as a defining characteristic by those

heroes. The discovery of a positive correlation between the IHBS and self-efficacy does not

provide evidence of the measure's discriminant validity.

Arguably the most important implication of Study 5 was the replication of the significant t-test results in a larger sample of heroes and nonheroes. This finding demonstrates the construct validity of the IHBS. The Cohen's *d* indicated a large effect, which adds to the strength of this finding. The IHBS appears to generate valid data on heroism and can distinguish between heroes and nonheroes.

Limitations

The correlation between the IHBS and the moral courage scale was positive as hypothesized; however, this relationship was stronger than expected. Moral courage scales, including this one, have been used in place of heroism measures (e.g., Osswald et al., 2004; Walker & Frimer, 2007). As noted above, moral courage is a similar but distinct construct. This strong correlation suggests the moral courage scale was an adequate stand-in for intended heroic behavior. This evidence may support the validity of past studies of heroism that used moral courage scales to assess heroism, although it also suggests the moral courage scale may not effectively distinguish moral courage from heroism. Heroic actions must benefit people, while morally courageous acts do not need to benefit others. Additionally, acts of moral courage must be motivated by a deep sense of justice and personal values, whereas heroic acts do not. There is overlap between moral courage and intended heroic behavior, and this correlation suggests moral courage captures something close to heroism.

Although I collected a large enough sample to compare heroes to nonheroes, the samples of social and civil heroes were relatively small (*n* = 43 and 61 participants, respectively). I discovered a significant difference between civil and social heroes when comparing them on the civil heroism subscale, but there was no significant difference when comparing them on the social heroism subscale. This suggests the civil heroism subscale might

be able to distinguish between civil and social heroes. However, while the test was statistically significant and the confidence interval did not include 0, the confidence interval was extremely wide. Based on this result, it was unclear if the civil heroism subscale could be used to distinguish civil from social heroes. Additionally, these results suggest the social heroism subscale did not distinguish civil from social heroes. In short, the IHBS works best as a measure of heroism rather than as measures of the individual forms of civil or social heroism. Further research is required to examine the validity of the civil and social subscales as standalone measures. Despite these limitations, it was clear the full 8-item IHBS demonstrated convergent validity, discriminant validity, and, finally, construct validity by distinguishing heroes from people who have not acted heroically.

Chapter 7: General Discussion

While there has been growing interest in both heroism science and heroism training programs (Allison et al., 2019; Franco et al., 2017), until now there has been no measure of intended heroic behavior. A scale of intended heroic behavior was needed to enable researchers to conduct developmental studies of heroes and to test the efficacy of hero training programs. Therefore, in the present study I designed and validated the intended heroic behavior scale (IHBS).

To generate items for this scale, I reviewed published interviews with decorated heroes to create items that included a variety of heroism scenarios. I also used scales of moral courage, prosocial behavior, and bystander behavior as guides for creating items. These steps resulted in a 47-item draft of the IHBS.

To ensure these items reflected intended heroism rather than related constructs, such as empathy or social responsibility, heroism experts and laypeople were consulted. Risk to the hero and benefit to others are critical parts of the definitions of heroism. Heroism experts were asked to rate how closely each item matched their understanding of heroism. Laypeople were asked to rate how risky the item was to the actor, how beneficial the action was to others, and how realistic the situations were. I added and deleted items based on feedback from laypeople and experts, and this resulted in a 32-item survey that included 16 civil heroism and 16 social heroism items.

In subsequent studies, I further reduced the number of items and worked to improve the measure's reliability and validity. I deleted items when most participants indicated they would always or never act heroically in that situation. This helped to ensure the remaining items generated a range of high, medium, and low scores across the sample. Using exploratory factor

analysis, I explored multiple versions of the scale and discovered the factor structure of the items with the best psychometric properties was an 8-item scale. I also discovered this 8-item scale contained items representing two distinct factors, civil and social heroism. Using confirmatory factor analysis, I discovered the bifactor model provided the best fit for the data. This means the eight items worked best when assessing intended heroism and did not work as well when separating the items to measure social or civil heroism. These assessments helped ensure the final set of IHBS items contained the fewest possible items needed to account for the most variance and to cover the full range of heroic acts.

I used additional measures in these, and subsequent, studies to establish the convergent, content, and discriminant validity of the measure. Heroes help others. Accordingly, the IHBS correlated positively with measures assessing concern for others, empathy, social responsibility, and with beyond-the-self concerns. Heroes also take risks. Correspondingly, the IHBS correlated positively with moral courage. These are all variables heroism should be positively related to, suggesting the IHBS demonstrates convergent validity.

Social desirability is a potential problem for scales that measure highly regarded attributes, such as heroism. I found no correlations between the IHBS and a social desirability scale. Additionally, the IHBS was not correlated with vitality. These are variables heroism should not be related to, suggesting the IHBS measures the construct it is intended to measure, intended heroic behavior, and does not measure constructs it is not designed to measure.

Perhaps the most convincing evidence of the IHBS's construct validity was the results of the comparisons between heroes and nonheroes. While the sample of heroes in Study 4 was small, the IHBS was able to accurately distinguish between participants who had acted heroically and participants who did not. I replicated this finding in a larger sample of heroes and nonheroes

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in Study 5. Together, this evidence of content, face, convergent, discriminant, and construct validity strongly suggests the IHBS does indeed measure heroism.

Limitations

While the IHBS appears to generate valid data on intended heroic behavior, it is not without its limitations. Based on the replicated findings of convergent and construct validity across multiple samples drawn from within the U.S., I expect the IHBS will be an effective measure of intended heroic behavior for adults in the U.S. Studies 2 through 4 used participants aged 18 to 30, while Study 5 sampled adults over 18. However, no children or adolescents were included in tests of validity. Heroism training programs often train both adolescents and adults; thus, it would be helpful to validate the factor structure of the IHBS and convergent and construct validity with adolescent samples. It seems likely most items will be relevant to adolescents, except for one that reads, "Risk your job to reveal the unethical behavior of a supervisor." This item may not be relevant to all adolescents. Future research should explore whether removing this item for adolescent participants alters the survey's psychometric properties. I do not recommend the use of the IHBS with children, primarily because of the reading level required to comprehend and respond to the items. However, future research could use the IHBS as a starting point for creating a heroism scale for children.

This measure was designed to analyze laypeople who might engage in civil or social heroism. Because of this, it is unlikely to assess other forms of heroism, including martial heroism. Further, the IHBS should not be used as a categorization or qualification tool for military, law enforcement, or other civil servants in the hiring, firing, or award process. Martial heroes are professionals who are trained to act in risky situations and who go above and beyond the call of duty (Franco et al., 2011). For example, some awardees of the Medal of Honor,

Distinguished Service Cross, or firefighters who receive the Medal of Valor would qualify as martial heroes. The IHBS would not be a valid measure of these heroes because professionals who are trained to act in risky situations experience different contexts and are likely different in other significant ways from civilians who take social or physical risks to benefit others. Likewise, it would be inappropriate to use the IHBS as an assessment tool in human resource hiring and termination practices. A score on the IHBS corresponds to the likelihood that someone may act heroically if given the opportunity: A high score means a person is likely to act heroically in such a situation, but not necessarily that they will act heroically. Individuals may intend to act heroically, but they may lack the capacity, or behavioral control, to do so if a situation presents itself.

Heroic acts must be directed towards nonrelative others. However, the final IHBS items do not specify the actions are directed towards strangers. While the measure in its current form does collect valid data on intended heroic behavior, a future version of this scale should test revised items that clearly describe these actions are benefiting strangers. An updated measure of intended heroic behavior that specifies the help is not directed towards relatives may discriminate better between heroic and prosocial behavior.

In addition, I did not directly validate whether the IHBS measures changes in the likelihood of acting heroically over time. Low mean scores and wide score distributions as well as the fact that heroes received significantly higher mean scores on the IHBS than nonheroes suggest the IHBS may be able to detect change over time, but this has not been tested directly. As such, heroism programs looking to assess changes in intended heroic behavior as a result of an intervention, and developmental psychologists interested in studying growth in intended heroic behavior over time should use this measure with caution. Future research should assess the

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IHBS's ability to detect change over time by comparing pre- and posttest scores in a sample of participants enrolled in a heroism training program.

Finally, this study only featured US adults. Consequently, results are limited to that cultural context. An action that might be considered merely prosocial or altruistic in the US might be considered heroic in another culture or country. For example, one participant described their experience of living in another country where the laws discouraged helping someone injured in the street, because the helper could be found liable for the victim's original injuries. The IHBS is not a universal measure of intended heroic behavior. However, the IHBS items may provide a useful starting point for the design of a scale of heroism in other cultures and countries.

Future Directions

As discussed in the limitations section, future research should examine the validity of the civil and social heroism subscales with larger samples. The mixed results seen in these studies could become clearer by testing larger groups of civil and social heroes. Additionally, future research should test the IHBS to ensure it can detect change over time. Although the scale's psychometric properties and its ability to distinguish heroes from nonheroes suggest it should be able to detect change over time, this was not explicitly tested.

These analyses also produced other novel findings that should be investigated further. For instance, a basic assumption of heroism science has been that heroes are rare (Franco & Zimbardo, 2006). However, studies 4 and 5 suggest heroism may not be as rare as has been assumed. In studies 4 and 5 I asked participants if they had done anything that someone, not necessarily themselves, considered heroic. Participants' open-ended responses were examined to determine which actions were clear examples of heroism, and these analyses revealed 12.93% of the total sample in Study 4, and 14.03% of the total sample in Study 5, had taken heroic action.

These percentages were considerably higher than had been anticipated. Study 4 was limited to a sample of 18- to 30-year-olds, whereas the Study 5 sample included adults over 18. I first assumed the slightly higher percentage of heroes in the sample with older participants was because the longer a person lives, the more likely they are to encounter a situation requiring heroism, but there was no correlation between age and the IHBS in Study 5. Based on these limited findings, it appears there may be more heroes than there are adults who are left-handed (10.6%; Papadatou-Pastou et al., 2020), or US adults who own a motorcycle (8%; Motorcycle Industry Council, 2019), or white males with colorblindness (8%; Deeb, 2005). Future research should investigate the prevalence of heroes in additional samples and contexts.

Another novel finding concerned the proportion of civil to social heroes. Using data from Study 5, I found that for every social hero, there were about 1.5 civil heroes. In other words, more civil heroes than social heroes emerged. It is interesting to note that more awards are made to civil than social heroes. Whistleblowing was one of the most common forms of social heroism participants reportedly engaged in. However, whistleblowing is often looked down on by companies and laypeople (Dungan et al., 2015). This may be the reason social heroes are not as often decorated or recognized for the risks they take. Social heroism, and whistleblowing specifically, may be much more common than previously recognized. Future research should examine the prevalence of social heroism in the population.

Implications

The IHBS has both theoretical and practical implications for the study of heroism. Practically, the IHBS will enable researchers to conduct studies featuring larger samples of potential heroes. The greatest difficulty in heroism science has been finding enough heroes to include in study samples (e.g., Franco et al., 2011; Franco et al., 2016; Midlarsky et al., 2006;

Riches, 2017; Walker et al., 2010). Not all heroic acts are performed publicly, especially in the case of social heroism, which makes this population difficult to identify. Previous studies have relied on exemplar methods, finding decorated heroes and including them in samples (e.g., McNamee & Wesolik, 2014; Midlarsky, 2005, 2006; Oliner & Oliner, 1988; Walker et al., 2010), but these groups still tend to be relatively small. The IHBS can be used to predict who is likely to act heroically and may aid in identifying people who have already acted heroically. In short, the IHBS should enable studies with large samples of heroes and potential heroes.

The fact that the IHBS is an interval scale will enable researchers to compare people who score high on intention to behave heroically to those who score low on intention to behave heroically and determine what differences may exist between these groups on different variables. This dissertation demonstrated the IHBS does not suffer from ceiling or floor effects, mean scores are well distributed. This should enable heroism researchers and practitioners to track changes in heroic intention over time. Future researchers may wish to follow high scorers longitudinally to examine their development.

In addition, the scale may be useful for testing the efficacy of hero training programs. Currently little evidence exists that heroism training has the desired effect (Heiner, 2018), and provided additional studies are performed to validate the IHBS's ability to measure change over time, the IHBS could be used to evaluate heroism programming to determine which aspects of heroism training programs work as intended.

I expect both heroism researchers and practitioners interested in the development of heroism will find use for this scale in their work. These applications and practical implications of the IHBS will enable important advances in the study and application of heroism research.

Theoretically, the IHBS should help advance theory-building in heroism science. One of the most common questions in heroism science is "How do heroes develop?" (e.g., Frisk, 2019; Lickerman, 2010; Riches, 2017; Schlenker et al., 2008; Svoboda, 2013; Zimbardo, 2011). As discussed previously, the IHBS will enable researchers and practitioners to identify people who are more and less likely to act heroically, allowing these groups to be compared over time. People who are more likely to act heroically could be followed longitudinally to discover how heroes develop. The aim would be to gather data on these individuals, before and after heroic acts, that would illuminate the trajectories that support the development of heroes. The scale could also help shed light on the immediate and delayed effects of heroic behavior.

Finally, the IHBS is an interval measure, which means it will enable investigations of heroism with statistical methods that were previously impossible. Currently constructs such as empathy, social responsibility, courage, and altruism have been theorized to be related to heroism (Kohen et al., 2017; Schmid Callina et al., 2017), but without an interval measure of potential heroes, the field was not well prepared to test these relationships. Using the IHBS, researchers can model and investigate complex relationships between relevant variables, as well as compare differences between individuals or groups who are more and less likely to act heroically.

Conclusion

The IHBS is poised to advance the study of heroism. The IHBS predicts which individuals are likely to act heroically in the future, and as such, it can be used to identify large and diverse samples of potential heroes for empirical studies of heroism, examine change over time in a person's intentions to act heroically, and assess the utility of heroism training programs. Finally, the IHBS will enable analysis of the constructs and contexts related to heroism though

statistical methods, such as multiple regression and structural equation modeling, which will help

move the field of heroism science forward.

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Appendix

Table 1

Items Designed to Measure Civil Heroism Prior to Study 1

Item number	Item
1	Risk physical injury to help a stranger in a dire situation.
2	Risk physical injury to help a stranger in a dangerous emergency.
3	Risk your physical safety to benefit others.
4	Help someone who sustained a serious injury at the risk of being injured yourself.
5	Take action to help others even if it meant getting hurt.
6	Sacrifice for a stranger even though you may be at risk.
7	Jump on train or subway tracks to rescue a person in danger.
8	Risk physical injury to pull a stranger out of a burning car.
9	Risk physical injury to pull a stranger out of a collapsing building.
10	Risk physical injury to rescue a stranger from attacking dogs.
11	Risk physical injury to intervene during an armed robbery.
12	Risk physical injury to intervene during a physical assault.
13	Swim in dangerous waters to rescue a person from drowning
14	Return into a burning building to save a stranger.
15	Intervene directly in a dangerous domestic dispute if it looked like someone would get badly hurt.
16	Put yourself at risk by standing up to someone being physically abusive to a stranger.
17	Step in to stop violent extremists harassing a person.
18	Take action to stop a person physically assaulting a child.
19	Risk your own well-being to help someone badly in need of help.
20	Risk your safety for a stranger in real crisis or need.
21	Investigate if you were awakened at night by a stranger calling for help.
22	Risk physical consequences to protest something you believe in.

Table 2

Items Designed to Measure Social Heroism Prior to Study 1

Item number	Item
1	Blow the whistle on injustice even though doing so would put you at risk.
2	Defy unjust authority even though doing so would put you at risk.
3	Call out unethical behaviors even though doing so would put you at risk.
4	Risk your job to reveal the unethical behavior of a supervisor.
5	Risk your job by calling out unethical actions you noticed at the workplace.
6	Risk social consequences to help a stranger.
7	Risk economic consequences to help a stranger.
8	Risk your job to reveal the theft of a supervisor.
9	Refuse the order of a commanding officer if it meant hurting someone needlessly.
10	Have hidden Jewish friends during the time of the Holocaust.
11	Speak up against sexist comments.
12	Speak up against racist jokes.
13	Risk your job to speak out against a superior making racist comments.
14	Put yourself at risk by standing up to someone being verbally abusive to a stranger.
15	Risk your relationship with friends to actively pursue a cause you believe in.
16	Do the right thing even though doing so would put you at risk.
17	Stand up and speak out if you saw wrongdoing.
18	Not let intense social pressure stop you from doing the right thing.
19	Work to oppose an unethical company even though doing so would put you at risk.
20	Speak out against an unethical company even though doing so would put you at risk.
21	Work to oppose an unethical government even though doing so would put you at risk.
22	Speak out against an unethical government even though doing so would put you at risk.
23	Speak out against an unethical group even though doing so would put you at risk.
24	Work to oppose an unethical organization even though doing so would put you at risk.
25	Participate in a beneficial social/political movement even though doing so would put you at risk.

Table 3

Items Designed to Measure Civil Heroism Prior to Study 2

Item number	Item
1	Risk physical injury to help a stranger in a dire situation.
2	Risk physical injury to help a stranger in a dangerous emergency.
3	Risk your physical safety to benefit others.
4	Help someone who sustained a serious injury at the risk of being injured yourself.
5	Take action to help others even if it meant getting hurt.
6	Sacrifice for a stranger even though you may be at risk.
7	Jump on train or subway tracks to rescue a person in danger.
8	Risk physical injury to pull a stranger out of a burning car.
9	Risk physical injury to pull a stranger out of a collapsing building.
10	Risk physical injury to rescue a stranger from attacking dogs.
11	Risk physical injury to intervene during a physical assault.
12	Swim in dangerous waters to rescue a person from drowning
13	Return into a burning building to save a stranger.
14	Put yourself at risk by standing up to someone being physically abusive to a stranger.
15	Step in to stop violent extremists harassing a person.
16	Take action to stop a person physically assaulting a child.
17	Risk your own well-being to help someone badly in need of help.
18	Risk your safety for a stranger in real crisis or need.
19	Risk physical consequences to protest something you believe in.
20	**Risk your own well-being to support others.**
21	**Risk trauma to yourself to support someone through trauma.**

Note. Bold items were added before Study 2

Table 4

Items Designed to Measure Social Heroism Prior to Study 2

Item number	Item
1	Blow the whistle on injustice even though doing so would put you at risk.
2	Defy unjust authority even though doing so would put you at risk.
3	Call out unethical behaviors even though doing so would put you at risk.
4	Risk your job to reveal the unethical behavior of a supervisor.
5	Risk your job by calling out unethical actions you noticed at the workplace.
6	Risk social consequences to help a stranger.
7	Risk economic consequences to help a stranger.
8	Risk your job to reveal the theft of a supervisor.
9	Refuse the order of a commanding officer if it meant hurting someone needlessly.
10	Have hidden Jewish friends during the time of the Holocaust.
11	Risk your job to speak out against a superior making racist comments.
12	Put yourself at risk by standing up to someone being verbally abusive to a stranger.
13	Do the right thing to help others even though doing so would put you at risk.
14	Work to oppose an unethical company even though doing so would put you at risk.
15	Speak out against an unethical company even though doing so would put you at risk.
16	Work to oppose an unethical government even though doing so would put you at risk.
17	Speak out against an unethical government even though doing so would put you at risk.
18	Speak out against an unethical group even though doing so would put you at risk.
19	Work to oppose an unethical organization even though doing so would put you at risk.
20	Put yourself at risk to participate in a beneficial social/political movement.
21	**Risk your mental health to support others**

Note. Bold items were added before Study 2

Table 5

Exploratory Factor Analysis Results of Intended Heroic Behavior Scale Items

		Factor Loading	
Variable	Item	1	2
Factor 1: Civil Heroism			
CH3	Take action to help others even if it meant getting hurt.	**0.84**	0.01
CH7	Risk your physical safety to benefit others.	**0.88**	-0.08
SH10	Do the right thing to help others even though doing so would put you at risk.	**0.68**	0.18
SH16	Risk your mental health to support others.	**0.49**	0.28
Factor 2: Social Heroism			
SH2	Call out unethical behaviors even though doing so would put you at risk.	-0.02	**0.80**
SH3	Risk your job to reveal the unethical behavior of a supervisor.	-0.03	**0.68**
SH13	Work to oppose an unethical organization even though doing so would put you at risk.	0.06	**0.80**
SH14	Put yourself at risk to participate in a beneficial social/political movement.	0.00	**0.72**
	Eigenvalues before rotation	2.26	2.39
	% of variance explained after rotation	28.31	29.85

Note. Participants were asked to "Please imagine you encounter the following situations, and indicate how likely you would be to perform each action from 1 (*not at all likely*) to 7 (*very likely*)."

"How likely are you to…"

Table 6

Final Intended Heroic Behavior Scale (IHBS) Items

Number	Item
1	Take action to help others even if it meant getting hurt.
2	Risk your physical safety to benefit others.
3	Do the right thing to help others even though doing so would put you at risk.
4	Risk your mental health to support others.
5	Call out unethical behaviors even though doing so would put you at risk.
6	Risk your job to reveal the unethical behavior of a supervisor.
7	Work to oppose an unethical organization even though doing so would put you at risk.
8	Put yourself at risk to participate in a beneficial social/political movement.

Note. Participants were asked to "Please imagine you encounter the following situations, and indicate how likely you would be to perform each action from 1 (*not at all likely*) to 7 (*very likely*)."

"How likely are you to…"

Table 7

Confirmatory Factor Analysis Model Comparison

Fit measure	Model descriptive statistics			
	Single general factor	Correlated two-factor	Higher-order factor	Bifactor
χ^2	184.57 (20), $p < .001$	66.39 (19), $p < .001$	66.39 (19), $p < .001$	16.49 (12), $p = .170$
RMSEA	0.16, 95% CI [0.14, 0.18]	0.09, 95% CI [0.07, 0.11]	0.09, 95% CI [0.07, 0.11]	0.03, 95% CI [0.00, 0.07]
CFI	0.881	0.966	0.966	0.997
TLI	0.833	0.949	0.949	0.992
IFI	0.882	0.966	0.966	0.997
SRMR	0.066	0.042	0.042	0.019
AIC	8147.08	8030.90	8030.90	7995.01
BIC	8207.23	8094.80	8094.80	8085.22
ADJ BIC	8156.48	8040.88	8040.88	8009.10

Note. Structural equation modeling was used for the analysis. RMSEA= root-mean-square error of approximation; CFI= comparative fit index; TLI= Tucker Lewis index; IFI= incremental fit index; SRMR= standardized root mean square residual statistic; AIC= Akaike information criterion; BIC= Bayesian information criterion; ADJ BIC= Sample size adjusted Bayesian information criterion.

Figure 1

Correlated Two-Factor Model Confirmatory Factor Analysis for Study 4
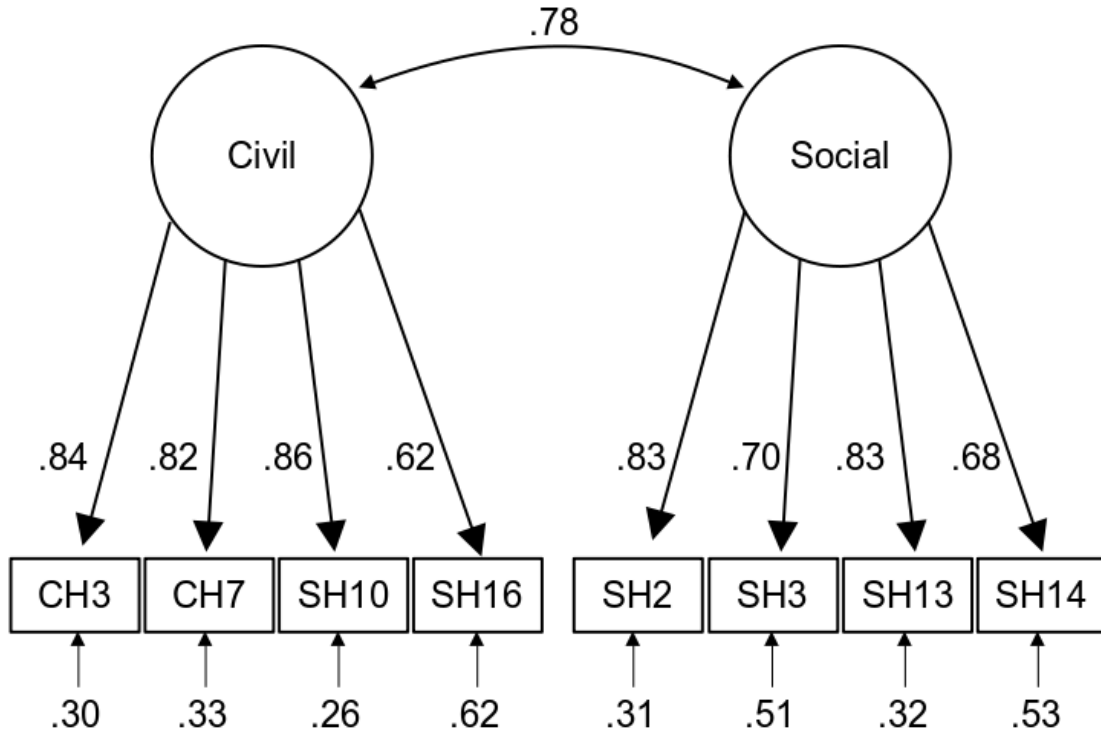
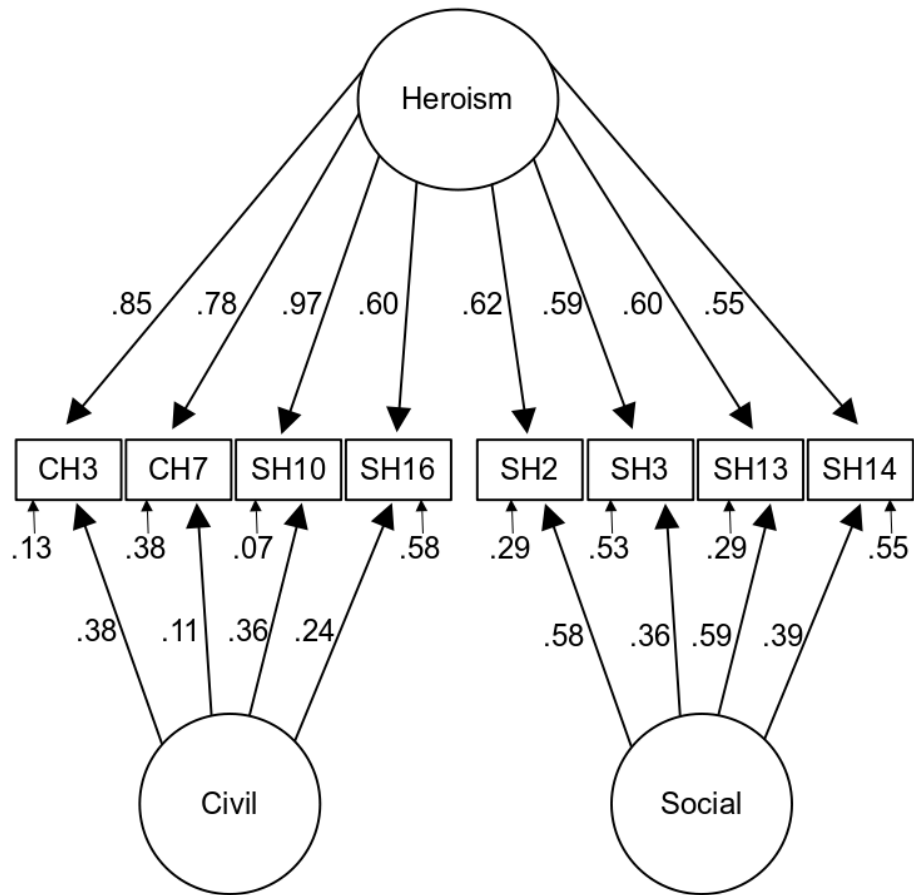*Note*. All modeled correlations and path coefficients are significant (*p* < .05).

Figure 2

Higher-Order Factor Model Confirmatory Factor Analysis for Study 4
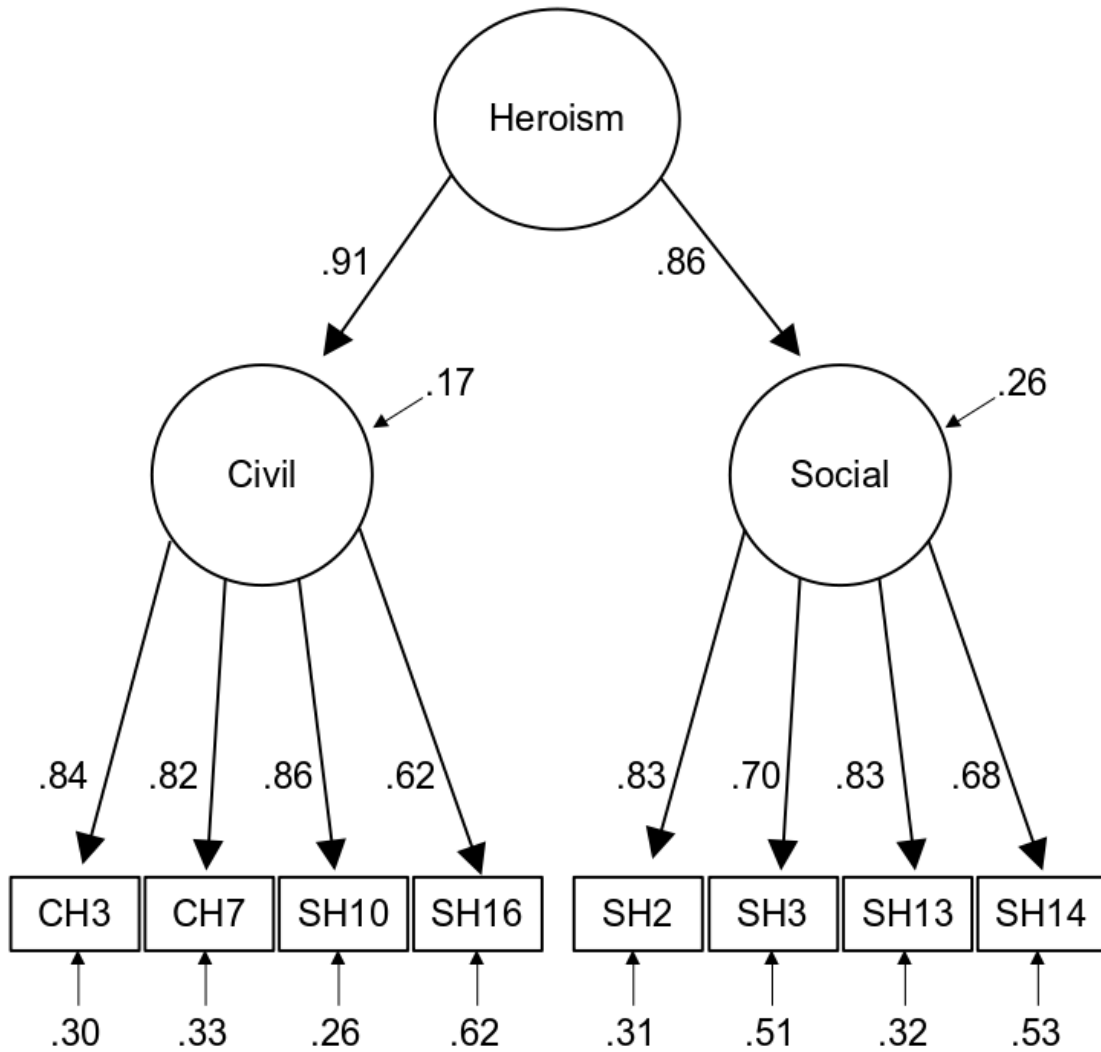
Note. All modeled correlations and path coefficients are significant (*p* < .05).
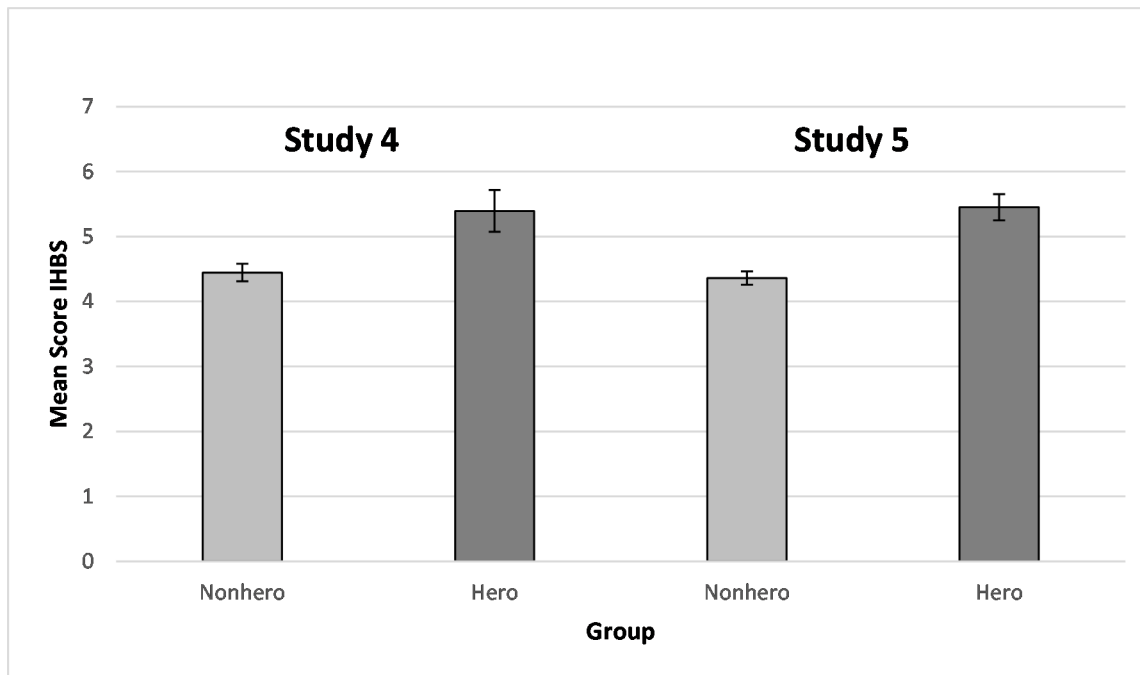
Figure 3

Bifactor Model Confirmatory Factor Analysis for Study 4

Note. All modeled correlations and path coefficients are significant (*p* < .05).

Figure 4

Comparing Scores of Heroes and Nonheroes on the IHBS in Study 4 and 5

Note. Mean scores on the IHBS are shown for the nonhero and hero groups described in studies 4 and 5. Study 4 hero group had a significantly higher score on the IHBS (n = 41; M = 5.39, SD = 1.02) than the nonhero group (n = 276; M = 4.45, SD = 1.14, t(55) = 5.47, p < .001, d = 0.85, 95% CI [0.51, 1.18]). In Study 5 the hero group had a significantly higher score on the IHBS (n = 109; M = 5.45, SD = 1.05) than the nonhero group (n = 582; M = 4.36, SD = 1.24, t(169) = 9.62, p < .001, d = 0.90, 95% CI [0.69, 1.11]). Error bars show the 95% confidence interval around each mean.