THE DEBT OF HEROISM: AN INITIAL TEST OF THE LEGACY ATTAINED BY
SOCIAL TRANSACTION (LAST) MODEL

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BY SOCIAL TRANSACTION (LAST) MODEL

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DEDICATION

To my loving family, for your unfailing support, guidance, friendship, and encouragement.
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ABSTRACT

Rhetoric surrounding heroes suggests their contributions create a sense of indebtedness and that they deserve to be awarded a legacy for such contributions. Utilizing a novel theoretical framework, coined the legacy attainment by social transaction (LAST) model, these claims are submitted to empirical scrutiny. The question concerning heroes’ potential to elicit indebtedness and efforts to clear such debt are explored via three studies. Study 1 examines whether heroic contributions that are unrepaid result in greater tolerance of a transgression. Study 2 examines whether thinking about a hero and being led to feel indebted to them prompts repayment via a legacy, and whether such indebtedness has negative consequences for self-esteem and negative affect. Finally, Study 3 examines whether heroic contributions that are unrepaid promote a greater recall of information pertaining to the hero, potentially facilitating their legacy.
“Every single one of us owes our fallen heroes a profound debt of gratitude.”

– Barack Obama (2014)

“"Our debt to the heroic men and valiant women in the service of our country can never be repaid. They have earned our undying gratitude."

– Harry. S. Truman (1945)

Heroes permeate history and can be traced back to at least 2000 BCE with stories such as the *Epic of Gilgamesh*, which describes a Sumerian hero-king’s adventures. We know about such heroes from the past because of their legacies, which live on in society through literature, statues, and of course, in people's minds.

Why do heroes assume such prominent roles in the drama of our collective memory? Although part of the reason for these legacies may obviously stem from the hero’s positive contributions to the world, might such legacies also be the product of a different kind of reaction to heroic contributions? Rhetoric surrounding heroes often alludes to the idea of indebtedness. When speaking of heroes people may refer to “the debt we owe them”, and many hostages and Hollywood damsels in distress have proclaimed of their rescuer “I owe them so much”.

Concerning heroes’ legacies, they appear to have varying durations and are often yoked to geographical boundaries. A local firefighter in a small town may be remembered for twenty years after saving a child from a burning car, but she may be unrecognized beyond the town’s borders. In comparison, a general who leads a rebellion against an oppressive monarchy may go down in the history books with their deeds recounted to school children across the country centuries later. But is there a connection between such legacies and the feelings of indebtedness that heroic contributions may evoke? The present paper examines this thesis, informing whether legacies are awarded to heroes to avoid feelings of debt.
Despite a burgeoning interest in the social psychological study of heroism, current theory and research has not considered the idea that a heroes’ legacy may be a result, in part, of efforts to clear feelings of indebtedness created by heroic contributions. Accordingly, three studies probe three aspects of this idea. First, if unrepaid heroic contributions create a sense of debt, then might individuals be more willing to tolerate their transgressions, potentially as a way to clear feelings of indebtedness? (Study 1). Second, if a hero is brought to mind, and people are led to feel indebted to them, do they experience negative psychological consequences as a result of such debt? And, are they then motivated to award a legacy to the hero? (Study 2). Finally, if an unrepaid hero is brought to mind, does this motivate people to remember details about their life more accurately, potentially facilitating the hero’s legacy? (Study 3).

**A new perspective on heroism: Legacy attainment by social transaction (LAST)**

Most theory and research on heroism suggests heroes offer a range of psychological functions, for example, acting as leaders to guide others through difficult circumstances, (Freud, 1922; Le Bon, 1895; Fromm, 1941), providing vicarious experiences of success (Bernhardt et al., 1998), increases in positive affect and self-esteem (as with basking in reflected glory; Cialdini et al., 1976), offering ideal self-images that guide behavior towards attaining the ideal self (Higgins, 1987; Sullivan & Ventor, 2010; Caughey, 1984), and acting as role models that steer an individual’s behavior towards positive, socially desirable ends (Yoon & Vargas, 2014). Collectively, this research informs many aspects of heroism, but fails to consider the potential for heroes to create feelings of indebtedness and the motivational repercussions of such debt. However, one recently developed theoretical
framework offering a perspective on heroes that does consider indebtedness, is the legacy attainment by social transaction (LAST) model of heroism (McCabe, 2015).

**Theoretical Roots**

The LAST model provides a conceptual framework for understanding psychological aspects of both heroes, and people’s relationships with heroes. As its name alludes to, it has two theoretical ancestors: social exchange theory (SET; Homans, 1958), and the legacy motive (e.g., Wade-Benzoni, 2002; Fox, Tost, & Wade-Benzoni, 2010). An outline of these theories is presented below before they are combined to provide a novel perspective on heroism.

**Social exchange theory.** SET offers a theoretical lens to aid understanding of transactions conducted between individuals and/or groups in social interactions (Blau, 1964; Homans, 1958; Thibaut & Kelley, 1959). The theory posits people routinely engage in implicitly and explicitly negotiated exchanges that impact both immediate and long term outcomes. These exchanges are conducted on the premise that one tries to maximize the best outcome. The best outcome is taken to mean the outcome which maximizes subjective value. Value is seen to be the outcome of weighed rewards minus weighed costs. Rewards refers to the positives that will be gleaned from such an exchange, while costs are negatives incurred either due to a loss of resources or alternatives. According to Blau (1964, pg. 91): “Social exchange…refers to voluntary actions of individuals that are motivated by the returns they are expected to bring and typically do in fact bring from others”. It is further stated that it “involve[s] the principle that one person does another a favor, and while there is a general expectation of some future return, its exact nature is definitely not stipulated in advance” (Blau, 1986, p.93; that is to say the agreement may be implicit, Weick,
1979). In short, SET pertains to transactions conducted between individuals and groups.

Importantly, SET states that those involved in social transactions act in accordance with the ‘reciprocity principle’, whereby any value received should be returned to an equal degree. Value is argued to manifest in many ways, for example, as social help (Goranson & Berkowitz, 1966), financial exchange (Lee, Piliavin, & Call, 1999), or the mutual and progressive disclosing of personal information (Feigenbaum, 1977). The theoretical and applied value of SET is evinced in its application to a range of domains. One study examining favors, for example, found that a confederate, who brought a participant a can of coke while ostensibly waiting for the study to begin, resulted in the participant repaying the favor by purchasing more raffle tickets from the confederate to increase their chances of winning a prize. This study suggests even minor social transactions may be informed by the reciprocity principle (Regan, 1971). Other research focusing on romantic relationships highlights how feelings of being rewarded (e.g., experiencing a shared interest) and avoidance of costs (e.g., arguing) positively impacts relationship investment, satisfaction, and commitment (Rusbult, 1983). SET has even informed gerontological phenomena, finding that elderly widowed women who frequently experienced social exchanges that either over-benefitted or under-befitted a person had greater levels of loneliness (Rook, 1987). Taken together SET has been applied to a range of areas, and evidence for the theory has accumulated from a multitude of domains.

Legacy motive. The other parent of the LAST model is the legacy motive. The legacy motive refers to the fundamental human drive to live on into the future through the achievement of a role, or, the accomplishment of an action that confers some variety of remembrance. The idea can be traced through a number of historic and
literary sources. For example, in the *Epic of Gilgamesh* a Sumerian hero-king is spurred to achieve an undying legacy, by searching for immorality, following the death of his friend. Many thinkers across disciplines (e.g., Becker [1973], Durkheim [1897], and Nietzsche [1891]) have alluded to the role mortality concerns play in prompting legacy striving. Indeed, across hundreds of studies, research derived from terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) suggests reminders of mortality motive people to pursue pathways conveying literal and symbolic immortality.

The legacy motive is also argued to be related to the concept of generativity (Lifton, 1983; Wade-Benzoni, 2002). Generativity broadly refers to the desire to establish, care for, and live through future generations (Erikson, 1950; Kotre, 1984; McAdams & de St. Aubin, 1992). Taken together, both death concerns and generativity appear intertwined with the legacy motive. Indeed, research suggests reminders of mortality can increase generativity (particularly in older people; Maxfield et al., 2014), and result in a variety of generative acts, for example, donating to charities that will impact the future (Wade-Benzoni, Tost, Hernandez, & Larrick, 2012), and a greater interest in having children (Wisman & Goldenberg, 2005). Through such generative acts an individual can attain a legacy by contributing to future generations, while at the same time, symbolically circumventing death. Consequently, the legacy motive is argued to be a fundamental drive underlying much of human behavior.

In conjunction, SET and the legacy motive offer a novel perspective on heroism detailed here as the LAST model. At a most basic level, the model posits heroes are individuals who perform a behavior, driven by the legacy motive, that contributes *lasting value* towards society, and that, in line with the reciprocity
principle, culture/society repays that value by bestowing a legacy on the hero congruent with the impact and duration of their contribution.

Processes of the LAST model

The LAST model assumes that heroism is a continuous construct, with some heroes being more (or less) heroic than others. And as with extant definitions of heroes (e.g., Goethals & Allison, 2012; 2013), it assumes that heroism can be transient — that the status of hero is not necessarily permanent, and may in fact be short lived. Finally, following observations that the hero status is often conferred and maintained by society (Rollin, 1983; Klapp, 1949), the LAST model construes heroism as a transactional process involving both the hero and culture/society, rather than exclusively focusing on heroes and overlooking the importance of society’s role in the creation and maintenance of the heroic. With these three considerations in mind, a detailed step by step walkthrough of the transactional nature of the theory is presented below.

The heroic contribution

Although not the focus of the present research, the LAST model posits that the transaction begins with an individual aiming (explicitly or implicitly) to make a contribution to culture/society because they are motivated to attain a legacy. However, regardless of the actual (or implicit) motives underlying the behavior, the important point of current relevance is that a behavior occurs that makes a notable contribution to (some segment of) society. This contribution can be to a large cultural group (e.g., a nation), a smaller collection of people (e.g., a town), or even a singular person (e.g., a relative). The contribution may be agreed (explicitly or implicitly) by the recipient (i.e., the nation, town, or individual) to be of value. In the case that the recipient is society or culture at large, the contribution might take the form of a
technological breakthrough (electricity), or societal reform (women’s suffrage). In the instance that the recipient is an individual, the contribution might, for example, take the form of love from a parent, training from a mentor, or being saved from drowning by a stranger. Once this value has been contributed, in accordance with the reciprocity principle, the person who made the contribution should receive a repayment of value equal to both the magnitude and duration of the contribution. But how are significant and lasting contributions repaid?

*Repaying the debt*

It certainly appears that heroic contributions cannot easily be repaid in direct form and kind. How, for example, do people repay to the same value and duration the significant and lasting contributions of George Washington, Amelia Earhart, or Albert Einstein? Financial repayment would appear insufficient as its value to the individual is reduced to zero on the hero’s death (given they themselves cannot use it), it provides no acknowledgement of the hero’s identity or accomplishments (as would a statue or plaque, for example), and its value can fluctuate (meaning the value repaid may suddenly be in excess, or worse, inadequate). Consequently, the capacity for money to act as a suitable repayment for a heroic contribution is dubious. However, according to the reciprocity principle, a repayment must be given, because, in the case that one party cannot act in accordance with the reciprocity principle, the principle is violated and negative outcomes may be experienced in the form of indebtedness.

Indebtedness is defined as “a state of obligation to repay another [and]… is assumed to have motivational properties, such that the greater its magnitude, the greater the resultant arousal and discomfort, and, hence, the stronger ensuing attempts to deal with or reduce it” (Greenberg, 1980; pg.4). The “discomfort” indebtedness elicits is argued to be multifaceted, and includes feelings of restricted freedom
(Brehm, 1966), loss of power and status (Blau, 1966), and potential negativity at anticipated costs of repayment (Homans, 1961). A host of research informs the negative aspects of being indebted including: 90.9% of people responding with “no” to the question “do you enjoy being indebted” (Greenberg et al., 1974), and participants who received help but who believed they could not (vs. could) reciprocate rated themselves as feeling less comfortable, more constrained, and more confined (Gross & Latane, 1974). Illustratively, one study recruited people for an ostensible interviewing job. In one condition “applicants” were told they were either underqualified for the job but would be employed anyway (being told “You don’t have nearly enough experience in interviewing… I don’t know how such a slip up could have occurred… I guess I’ll have to hire you anyway”). In the other condition, participants were told they were suited to the job and would be employed. Participants who thought they got more than they deserved, and who presumably perceived themselves to be indebted to the employer, reported greater levels of negative affect and, interestingly, displayed heightened productivity (Adams, 1963, Adams & Rosenbaum, 1962). Similarly, Brehm and Cole (1966) conducted an “impression study”, finding that when participants were offered a soft drink (vs. not) by a confederate (thus putting the participant in a state of indebtedness), and then told that it was important (vs. not) to give unbiased first impressions of the confederate, participants were more likely to engage in voluntary activities that would pay off the debt (i.e., help the confederate stack more piles of paper) prior to the evaluation, freeing them to give unbiased evaluations of the confederate. These findings suggest that indebtedness can result in compromises to one’s freedom. Further evidence for the negative consequences of indebtedness is provided by studies on ability (or inability) to reciprocate. When individuals are unable to reciprocate they refrain from
seeking more help, or are slower to ask for it (Castro, 1974; Clark, Gotay, & Mills, 1974), and even suffer decreased self-esteem (Gross & Latane, 1974).

Not only are there immediate negative psychological consequences of indebtedness, but there may be further consequences pertaining to the violation of the reciprocity principle. Specifically, violation of the principle can represent a threat to social order. Indeed, some argue humans are socialized to expect reciprocity and associate it with the idea that the world is just (Greenberg, 1980). By the exchange of anything of value (good, services, ideas etc) and the reciprocation of that value, evidence is provided that the social structure for exchange is present, ethical, meaningful, and valid. However, violation of the principle would signal an undermining of society's tenets, demonstrating the culture to be unethical, unstructured, and void of meaning which may have negative implications. Indeed, just world theory (Lerner, 1980), posits that people are motivated to believe that the world is just, such that people get what they deserve, and, deserve what they get. To the extent that repayment of debt is culturally delineated as just, such repayment may bolster belief in a just world. Conversely, failure to repay may undermine such beliefs leading to numerous negative psychological outcomes. Research examining threats to a just world, finds for example, that those high (vs. low) in belief in a just world are more prone to anger and sadness when confronted with an injustice (Dalbert, 2002). Similarly, participants exposed to a victim who is innocent (violation of just world) vs. guilty (commensurate with a just world), respond more quickly to justice-related words on a Stroop-like task, suggesting a desire to restore a belief that the world is just, and avoid the negative consequences of construing the world as an unjust place (Correia, Vala, & Aguiar, 2007).
Applying this analysis to the LAST model, to avoid negative outcomes associated with not repaying a heroic contribution, the culture/society is argued to (justly) repay the individual by promoting them to the appropriate level of heroism with a legacy equal to the value and duration of their contribution. By awarding a legacy, the balance of debt is restored, the transaction is complete, and potential negative consequences circumvented.

The LAST model is not entirely without precedent beyond its two theoretical ancestors and the discipline of psychology. Sociological research suggests one of the functions of transactions is to illustrate, maintain, and reaffirm social order by the appropriate reciprocity of value, and further, that failure to reciprocate can signal a loss of social order with negative downstream consequences (Schwartz, 1967).

Further, cultural anthropology has studied cultures practicing systems where social rank can be increased by the giving of a gift that places others in various forms of debt. The Moka exchange of Papa New Guinea, for example, involves tribe members gifting pigs to other members to become a influential leader, earning the title "big man" (e.g., Sahlins, 1972).

One of the advantages of the LAST model relates to its capacity to integrate and explain sometimes divergent extant research. For example, evidence points to both the scarcity and ubiquity of heroism (e.g., Latane & Darley, 1970; Zimbardo, 2011). According to the LAST model, heroes may appear both scarce and ubiquitous contingent on the perception of the individual as to the number of people who have contributed lasting value. Another literature debates whether heroes are driven by motives, and act in ways that are self-serving vs. altruistic (e.g., Stenstrom & Curtis, 2012; McAndrew & Perilloux, 2012). The LAST model allows for both of these to be true, as heroes may be motivated to bolster the self and procure a legacy to
symbolically circumvent death (Greenberg, Psyzczynski, & Solomon, 1986), but also
to be unselfishly concerned with and contribute to future generations (Fox, Tost, &
Wade-Benzoni, 2010). Taken together, the LAST model offers a parsimonious,
integrative conceptualization of heroism that is not bound to specific motivations
concerning altruism, and permits heroes to be both rare and widespread.

**The present research**

Despite the theoretical precedent, and the potential explanatory and
reconciliatory power of the LAST model, no research has directly tested its ideas. As
such, efforts are required to evaluate the validity of the model. To achieve this, three
studies bring an aspect of the LAST model, concerning indebtedness and motivations
to confer a legacy on unrepaid heroes, under empirical scrutiny. Specifically, if
heroes’ contributions are not repaid, and this presumably leads to a sense of
indebtedness, does this motivate efforts to repay the hero by tolerating their
transgressions (Study 1)? Further, if led to feel indebted to a hero, does such
indebtedness have negative psychological consequences, specifically for self-esteem
and negative affect? And, do people endorse options that would award the heroic
individual a legacy? (Study 2)? Finally, if led to consider an unrepaid heroic
contribution, do people remember more details about the contributor’s life, potentially
facilitating their legacy (Study 3)?

Because there has been no research conducted using the LAST model, there is
little information on appropriate methodologies to elicit and measure thoughts of
heroic contributions, indebtedness, and the motivation to award a legacy.
Accordingly, a preliminary study was conducted to test a basic prediction of the
model – that unrepaid heroes evoke feelings of indebtedness.
Preliminary Study

The preliminary study aimed to examine a basic prediction of the LAST model, namely, whether unrepaid heroes evoke greater feelings of indebtedness. Consequently, an experimental approach was employed to examine whether exposure to a person who had (vs. had not) been explicitly repaid for their valuable and lasting contributions would result in a greater sense of indebtedness, and, perceptions of heroism.

Method

Participants.

29 undergraduate students (age: $M=19.14$, $SD=1.18$; male = 6, female = 23) participated as part of an introduction to social psychology course. Participants were randomly assigned to a three-condition (heroic contribution not repaid vs. repaid vs. celebrity contribution) experimental design.

Materials and Procedure.

Heroic contribution manipulation. After filling in a short questionnaire about the class, participants completed a task designed to elicit thoughts of an unrepaid or repaid hero, or a celebrity’s contribution (with no information concerning repayment vs. not). Accordingly, participants completed one of three open-ended questions. One pertained to a hero, defined by the LAST model as someone who makes a valued and lasting contribution, with no indication that they had been repaid: “We want you to imagine a person who has done great things with their life. They have contributed in tremendously valuable and lasting ways both to you, and to society. Write down the thoughts and feelings this person arouses in you in the space provided below.” The repaid hero condition included the following additional text “The amazing things this person has done have been recognized for their contributions. The person has been
deemed a hero and their legacy will live on. Their accomplishments have been mentioned in various news outlets, a charity has been named after them, and a plaque has been established at their place of birth.” The control condition asked about a celebrity’s contributions “We want you to imagine a celebrity who has done great things with their life. Write down the thoughts and feelings this person arouses in you in the space provided below”. This control topic was selected as a conservative test of the LAST model as some have suggested celebrities can be conflated with heroism (North et al., 2005).

 Explicit measures of indebtedness and perceived heroism\(^2\). Two Likert-type questions examined feelings of indebtedness and perceptions of heroism. The former read: “On the previous page we asked you to think about a person. How much do you feel in debt to this person for their contribution?” The latter read: “On the previous page we asked you to think about a person. How much did this person make you think about a hero?” Responses were given on a 10-point scale (1- not at all, 10 – very much so).

 Results and discussion

 Perceived heroism. The explicit measure of perceived heroism was examined via a one-way (hero unrepaid, hero repaid, celebrity) ANOVA. This revealed a marginal effect of the manipulation, \(F(2, 26) = 2.65\), \(p = .09\), \(\eta^2_p = .17\) (see Figure 1). After writing about an unrepaid hero perceptions of heroism were lower, but not significantly, in comparison to the repaid hero condition, but marginally greater in comparison to the celebrity condition, \(t(17)=1.63\), \(p = .116\), \(d = 0.79\). Further, perceived heroism was greater after writing about the repaid hero, vs. the celebrity, \(t(17)= 2.24\), \(p = .034\), \(d = 1.09\).
Indebtedness. Responses to the explicit question about indebtedness was submitted to a one-way (hero unrepaid, hero repaid, celebrity) ANOVA. This revealed a significant effect of the manipulation, $F(2, 26) = 15.12$, $p < .001$, $\eta^2_p = .54$ (see Figure 2), such that after writing about an unrepaid hero feelings of indebtedness were greater in comparison to the repaid hero condition, $t(18) = 3.51$, $p = .002$, $d = 1.65$, and the celebrity condition, $t(17) = 5.41$, $p < .001$, $d = 2.62$. Further, after writing about the repaid hero, vs. the celebrity, there was a marginal effect such that indebtedness was greater in the repaid hero condition, $t(17) = 1.99$, $p = .057$, $d = 0.97$.

These results provide some support for the idea that unpaid heroes elicit debt feelings (relative to a repaid hero, or, celebrity). Having said this, the study’s sample size is very low, and demand characteristics may have been operative given the directness (transparency) of the study. Consequently, these inferences should be taken with a healthy dose of skepticism. Because of these limitations, confidence in the preliminary study’s conceptual conclusion would be bolstered by convergent findings with alternative approaches.

Study 1

Study 1 builds on the preliminary study to examine one implication of the LAST model concerning indebtedness. Specifically, if consideration of an unrepaid heroic contribution creates a sense of indebtedness, then people might try and balance such debt by demonstrating greater tolerance of the hero’s transgressions. To test this prediction, participants read a description of a medical pioneer, as research indicates doctors are often considered heroes (e.g., Myeroff & Larson, 1965; Goethals & Allison, 2012). As part of the task participants were informed the doctor’s work contributed to saving many lives, but he had not (vs had) been recognized for such contributions. Importantly, to examine whether the unrepaid heroic contribution
motivates effort to balance assumed indebtedness, a tolerance transgression task examining punishment severity was included, ostensibly as part of the reading task.

It is hypothesized that after reading about a unrewarded (vs. repaid) heroic contribution, which presumably creates a sense of debt, people will report greater tolerance of the hero’s transgressions, as indexed by lower punishment severity, potentially as a way to reduce feelings of indebtedness by “letting them off the hook”.

Method

Participants. One hundred-twenty participants (male = 80, female = 40, age M: 32.28, SD: 10.87) participated via Amazon Mechanical Turk and were compensated $1.88. To prevent participants participating in more than one of the studies reported (as they were all launched at the same time), coding developed by Peer, Paolacci, Chandler, and Mueller (2012) was used. The coding prevents participants from completing more than one of the related studies by recording their MTurk worker ID and, prior to the consent form screen, comparing the ID against a list of IDs generated by those who have previously completed related studies. The sample size for all studies was informed by the explicit indebtedness measure of the preliminary study with the following studies expected to find effect sizes of similar magnitude. Thus, using GPOWER software (http://www.gpower.hhu.de/en.html) and assuming the present manipulation (hero rewarded vs. hero not rewarded) between-subjects ANOVA design, with a .05 alpha level and power set to .80, approximately 60 participants were required per condition. Given the experimental nature of all studies, participants were randomly assigned to conditions. The procedures for all studies were approved by the University of Missouri Institutional Review Board (IRB) before being conducted and a written debriefing was included at the end of each study detailing the purpose of the research.
Materials.

Filler questionnaires. Participants first completed filler questionnaires that also allowed for some exploratory analyses of potentially relevant individual differences.

Hero manipulation. To manipulate thoughts of a hero who had been repaid (vs. not) for their contribution, participants completed a “reading task” detailing the work of Dr. Paul Langerhans, a pioneer in diabetes research. In the hero-rewarded condition the text read “In 1869, while studying the structure of the pancreas under a microscope, Paul Langerhans, a medical student in Berlin, discovered insulin. The discovery went on to help millions of people who suffer diabetes and save countless lives. He was awarded several prestigious medals and awards for his contributions to science. Langerhans personal life was fraught with issues. He was an alcoholic and his wife's diary tells us he regularly drank to the point of passing out.”. In the unrewarded condition the sentence concerning the award of the prestigious medals was replaced with “Despite this, he is rarely credited with the discovery and received no recognition for his contributions to science”.

Transgression tolerance task. Following this, participants completed two questions designed to examine tolerance of a transgression. The instructions for the first question read “On the 3rd of June, 1873, Paul Langerhans was arrested and taken to the county jail for being drunk and disorderly in public. The minimum jail sentence at that time was one week, and the maximum was 10 weeks. If you were the judge, how many weeks would you place Paul Langerhans in jail for?” Participants indicated their response on a 10-point Likert type scale (1–10 weeks). The instructions for the second question read “In addition to the jailing term, a fine was also levied on Paul Langerhans. At the time, the minimum fine was equivalent to $50, and the
maximum was $500. If you were the judge, how much would you fine Paul Langerhans?” Participants again indicated their response on a 10 – point Likert type scale ($50 - $500).

**Demographics.** In all studies, following the dependent variables, age, sex, religion, race, ethnicity, and political orientation were assessed. In Study 1, a question concerning the diabetic status of the participant was also included (Are you diabetic? Yes, No, Would prefer not to disclose).

**Results and discussion**

**Transgression tolerance.** The jail sentence and fine amount items were individually submitted to a one-way ANOVA. Regarding the jail term, there was no effect, $F(1,118) = .42, p = .52, \eta^2_p < .01$. There was however a significant effect on fine amount, $F(1,118) = 9.28, p = .003, \eta^2_p = .07$, such that after reading about an unrepaid heroic contribution, participants indicated a lower fine ($M = $99.17; $SD = $61.40), in comparison to the repaid hero condition ($M = $162.50; $SD = $148.90)\(^5\). The results on fine amount hold when controlling for diabetic status, $F(1, 117) = 11.72, p = .001, \eta^2_p = .09$, and when removing diabetics, $F(1,111) = 6.71, p = .011, \eta^2_p = .06$.

Study 1 provides some evidence that reading about an unrepaired hero leads to greater transgression tolerance, presumably as a way to balance feelings of debt. Though no effect was found on the jail term item, an effect was found in the hypothesized direction when examining the fine-item. One possible reason for an absence of effect on the jail term is that the item was not appropriately sensitive. In examining the means, a relative floor effect was detected (unrepaid condition: $M = 2.25$; repaid condition: $M = 2.53$); this raises questions concerning whether participants perhaps saw more than 2-3 weeks in jail as an excessive punishment. If
so, as alluded to by the means, then the measure offers little variability with which to detect effects of the manipulations.

The effect on fine amount is somewhat ambiguous as it could be construed either as reward, or, as a proxy for punitiveness or tolerance. If the latter is true, this might suggest a previously unconsidered way to clear feelings of indebtedness i.e., reducing financial punishments levied on an unrepaid hero. If the measure is tapping reward, there are also implications for the LAST model as the theory posits monetary rewards (or in this case, alleviating monetary punishment) are generally not viable ways to repay a hero. In either case, the findings offer some support for the idea of indebtedness to unrepaid heroes, and, given the reduced fine amount in the unrepaid hero condition, suggest further examination of the capacity for financial repayment to clear feelings of debt is warranted.

**Study 2**

Study 2 builds from Study 1 in six ways. First, because the LAST model specifies that a heroic contribution is determined by the individual, reading about a doctor may not have elicited thoughts of an unrepaid personal hero. Consequently, Study 2 uses a method designed to elicit thoughts of a personal hero to test the specific claims of the model. Second, Study 1 lacked a control condition to compare heroes’ vs. non-heroes’ contributions. Accordingly, a control condition of contributions from a non-hero is included, specifically eliciting thoughts of contributions from a celebrity (again, as with the preliminary study, because some have argued celebrities can be conflated with heroes; North et al., 2005). Third, a manipulation is included to elicit feelings of having repaid (vs. not) the hero (vs. celebrity). This manipulation is based on previous research on ease of retrieval (Greifeneder & Bless, 2007; Schwartz et al., 1991), and follows the theorizing that if
people are led to easily retrieve adequate cognitions concerning how they have repaid the hero (vs. celebrity), they may feel less indebted. Conversely, if led to find it difficult to retrieve adequate cognitions concerning how they have repaid a hero (vs. celebrity), they may feel more indebted. Fourth, because the LAST model specifies that a heroic contribution motivates repayment specifically in the form of a legacy, a number of measures are included that tap participants’ endorsements of options that convey a legacy. Specifically, items are included that convey a legacy via inclusion in a book, the establishment of a plaque, and the awarding of money. The awarding of money was included to build on the findings of Study 1 regarding potential financial repayment to a hero, and probes the LAST models tentatively shaky claim (given results of Study 1) that financial repayment is not a viable method for clearing feelings of debt. Fifth, if led to feel indebted to a hero (vs. celebrity), then according to the LAST model and extant research (e.g., Gross & Latane, 1974), this should elicit negative psychological consequences related to feelings of indebtedness and the violation of the reciprocity principle. Accordingly, following previous research, measures of self-esteem and negative affect are included. Finally, following the LAST models proposition that negative psychological outcomes are experienced as a result of feelings of indebtedness pertaining to unrepaid heroic contributions, and that this in turn, leads to the motivation to award the hero a legacy, the potential for such consequences (lower self-esteem and greater negative affect) to mediate endorsements of options that convey a legacy was examined.

It was hypothesized that after writing about a hero (vs. celebrity), and being led to feel indebted to them (vs. not), that participants will report greater endorsement of options that convey a legacy (inclusion in a book and selection of more durable material for a commemorative plaque), and potentially, a greater financial repayment.
In addition, it is hypothesized that those led to feel indebted (vs. not) to a hero (vs. celebrity) will report lower self-esteem and greater negative affect. Finally, these negative psychological consequences are hypothesized to mediate the endorsement of measures that convey a legacy after consideration of a hero and being led to feel indebted to them.

Method

Participants. Two hundred-forty participants (male = 129, female = 111, age M: 33.91, SD: 11.02) participated via Amazon Mechanical Turk and were compensated $1.88.

Materials.

Hero/celebrity manipulation. After the BJWS (α = .81) and indebtedness measures (α = .79), to elicit thoughts of a hero, participants were instructed “In the space below please think about your favorite hero (an actual person) and write down who this person is and the thoughts and feelings this person arouses in you.” The celebrity condition asked parallel questions about a celebrity. The request to detail an actual person in the hero condition was included as fictional heroes have been found to be evaluated differently, e.g., they are typically seen as more moral (Alison & Goethals, 2010).

Ease of retrieval task. To manipulate feelings of indebtedness, participants completed an ease of retrieval task used in previous studies (e.g., Greifeneder & Bless, 2007). Conceptually, this task aims to create feelings of indebtedness by proxy. If repayments are easy to bring to mind, the participant will presumably feel they do not owe the hero or celebrity. Conversely, if repayments are difficult to bring to mind, then the participant will presumably feel indebted to the hero or celebrity. Instructions read “When you think about the person you wrote about on the previous page, in what
ways have you given back to them? In the space below please list as many ways as you can that you've given back to your favorite hero/celebrity”. Below these instructions were either 5 spaces (easy retrieval/repaid condition), or 20 spaces (difficult retrieval/unrepaid condition). Participants then completed the dependent variables in a random order.

**Self-esteem.** To examine whether manipulations had consequences for self-esteem, the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965) was included. Instructions read “This questionnaire is designed to give a better picture of you as an individual. Enter the number in the space provided that most accurately describes how you feel about yourself right now. Please answer as truthfully as possible”. Example questions include “I feel that I have a number of good qualities” and “I take a positive attitude toward myself”. Responses were given on a 4 – point Likert scale (1 – Strongly disagree, 4 – Strongly agree; α = .94).

**Negative affect.** To examine whether manipulations had affective consequences, participants completed an 11-item negative affect scale consisting of the sadness and guilt subscales of the expanded positive and negative affect schedule (PANAS-X; Watson & Clark, 1994). Instructions read: “indicate to what extent you feel this way right now”. Below the instructions was a list of emotions such as “sad”, “guilty”, and “blameworthy”. Responses were given on a 5-point Likert scale (1 - very slightly, 5 – extremely; global α = .96; sadness α = .96; guilt α = .96).

**Plaque task.** As a measure of repayment via legacy a “plaque task” was included. Participants were instructed to “Imagine that a plaque is going to be established for the person you wrote about. Below are descriptions of a variety of materials. Please select the material you think the plaque should be made out of by clicking it”. Below these instructions were four material options with their “typical
duration”, copper (50 years), stainless steel (100 years), aluminum (150 years), and titanium (200 years). This measure, previously untested, aims to assess preferences for the duration of the legacy.

**Book task.** To examine motivations to award a legacy via inclusion in a written text, participants read the following instructions “Imagine that a publisher wants to create a book listing the 1000 greatest people ever. How much do you think the person you wrote about deserves to be included in the book?”. Participants indicated their responses on a 10 – point Likert type scale (1 – absolutely should not be included, 10 – absolutely should be included). Greater endorsement is presumed to indicate greater desire to award a legacy.

**Financial repayment task.** To assess financial repayment, participants completed a measure of the financial reward they believe the hero/celebrity should receive; instructions read “how many dollars do you think the person that you previously wrote about deserves to have in their lifetime? The average person earns $2,000,000, in their lifetime”. Responses were given on a 7-point Likert type scale with increments of $500,000 (1 - $500,000, 7 - $3,500,000 ). The financial figure for lifetime earnings is based on extant research for those with a bachelor’s degree, which the majority of MTurk workers hold (Day & Newburger, 2002; Paolacci, & Chandler, 2014).

**Results and discussion**

**Ease of retrieval task.** Number of responses on the ease of retrieval task were submitted to a 2 X (Hero/celebrity) 2 (Easy/difficult retrieval), ANOVA. This revealed a main effect of the hero/celebrity manipulation, \( F(1, 236) = 4.09, p=.04, \eta_p^2 =.02 \), such that participants in the hero condition gave a greater number of responses detailing how they had repaid them (\( M = 3.41; SD = 1.67 \)), in comparison to the
celebrity condition ($M = 2.89; SD = 2.3$). There were no other main or interactive effects, all $F_s < .126$, all $p_s > .26$.

**Plaque task.** Responses on the plaque task were submitted to a 2 X (Hero/Celebrity) 2 (Easy/difficult retrieval), ANOVA. This revealed a main effect of the hero/celebrity manipulation, $F(1, 236) = 10.1$, $p = .002$, $\eta^2_p = .04$, such that those in the hero condition, on average, selected a more durable material for the plaque ($M = 3.58; SD = .89$), in comparison to the celebrity condition ($M = 3.17; SD = 1.1$). There were no other main or interactive effects, all $F_s < .126$, all $p_s > .26$.

**Book task.** Responses on the book task were submitted to a 2 X (Hero/Celebrity) 2 (Easy/difficult retrieval), ANOVA. This revealed a main effect of the hero/celebrity manipulation, $F(1, 236) = 17.12$, $p < .001$, $\eta^2_p = .07$, such that those in the hero condition reported greater endorsement of including the hero in the book ($M = 8.09; SD = 2.35$), in comparison to the celebrity condition ($M = 6.68; SD = 2.86$). There were no other main or interactive effects, all $F_s < .05$, all $p_s > .82$.

**Financial repayment task.** Responses on the financial repayment task were submitted to a two-way, 2 X (Hero/Celebrity) 2 (Easy/difficult retrieval), ANOVA. This revealed no main effects, all $F_s < .63$, all $p_s > .42$. However, an interaction did emerge, $F(1, 236) = 6.47$, $p = .01$, $\eta^2_p = .03$, see Figure 3.

Within the difficult retrieval condition, those who wrote about a hero (vs. celebrity) reported they should receive a greater financial repayment $t(115) = 2.33$, $p = .02$, $d = 0.44$. In comparison, within the easy retrieval condition, there were no significant differences, $t(121) = -1.25$, $p = .21$, $d = -0.23$. Looked at differently, after writing about a hero, those who completed the difficult (vs. easy) retrieval manipulation reported the hero should receive a greater financial repayment $t(118) = 1.59$, $p = .11$, $d = 0.29$, though the effect was marginal. In comparison, after writing
about a celebrity, those who completed the difficult (vs. easy) retrieval manipulation reported the celebrity should receive a lesser financial repayment \( t(118) = 2.01, p = .04, d = 0.37. \)

*Self-esteem.* Scores on the Rosenberg Self-esteem scale were submitted to a 2 X (Hero/Celebrity) 2 (Easy/difficult retrieval), ANOVA. This revealed no main or interactive effects, all \( F_s < 1.47, \) all \( p_s > .22. \)

*Negative affect.* Reponses on the negative affect measure were submitted to a 2 X (Hero/Celebrity) 2 (Easy/difficult retrieval), ANOVA. This revealed no main or interactive effects on either global negative affect, or the guilt and sadness subscales, all \( F_s < .67, \) all \( p_s > .41. \)

*Meditational analyses.* Given the hero and retrieval manipulations did not influence self-esteem and negative affect, they are not eligible as mediators.

Study 2 provides some support for hypotheses derived from the LAST model as main effects of the hero manipulation suggest consideration of a hero resulted in the selection of a more durable material for a plaque, and, greater endorsement of including the person in the book. Consequently, people may be more inclined to bestow a legacy on a hero relative to a celebrity. However, the absence of an interaction with the retrieval task on these measures was counter to hypotheses. This null result may, in part, pertain to manipulation and measurement issues of the retrieval task and legacy measures respectively.

Regarding potential limitations of the legacy measures, the plaque task may be susceptible to a ceiling effect. This is inferred as within the hero consideration condition, the mean response on both the easy (\( M = 3.64; SD = .86 \)) and difficult (\( M = 3.52; SD = .91 \)) retrieval condition are nearing the upper limit of the 4-point scale, leaving little room to observe increases. A similar pattern is also present for the 10-
point scale associated with book task, within the hero condition, with easy \((M = 8.14; SD = 2.26)\) and difficult \((M = 8.04; SD = 2.47)\) retrieval.

Concerning the retrieval task, variations in the number of cognitions concerning repayment, as assessed by the ease of retrieval task, creates some methodological and conceptual concerns. On the one hand, it may be that the greater number of repayments recalled in the hero (vs. celebrity) condition across retrieval conditions represents a form of repayment. By listing more ways the individual has given back to the hero they may feel they have repaid the debt. If this is the case, the manipulation may not have worked as intended. On the other hand, the manipulation may still be valid in that the number of blank spaces was different between easy (vs. difficult) retrieval conditions. In other words, participants would still have seen that there were either just a few, or many, empty spaces, and thus feelings of indebtedness may have been more or less salient to them. In hindsight, some kind of manipulation check of the retrieval task to induce indebtedness may have been informative.

As with Study 1, effects emerged on the financial task in the form of an interaction between the hero/celebrity manipulation and the easy/difficult retrieval task. This has two implications. First, it suggests that the retrieval manipulation did in-fact result in feelings of indebtedness, in the hypothesized conditions, as greater financial reward was reported in the hero/indebted condition. Second, the findings lend further skepticism to the LAST models claim that financial repayment is inappropriate as way to clear feelings of debt. I return to these points in the general discussion.

Concerning negative psychological consequences, there is no evidence that being led to consider a hero and being made to feel indebted to them impacts self-esteem or negative affect, which thus also precludes the possibility of these mediating
effects on the primary outcomes. There are of course a number of potential reasons for these null results, including issues with the sensitivity of the dependent measures to what might be subtle effects, the potential lack of impact of the retrieval task to induce feelings of indebtedness, or the recall of more repayments on the retrieval task in the hero condition buffering against experiencing negative psychological outcomes. However, if we assume the retrieval task did successfully induce indebtedness, the absence of mediation might suggest the legacy bestowment is not triggered by negative psychological states (or at least self-esteem and negative affect).

**Study 3**

Study 3 builds on the previous studies in two ways. First, a number of researchers have suggested holocaust rescuers are often perceived as heroes (e.g., Midlarsky, Fagin Jones, & Corley, 2005). Consequently, reading about a holocaust rescuer who is not (vs. is) repaid offers another potential way to (presumably) elicit feelings of indebtedness and engage motivations to convey a legacy. Second, an alternative measure of conveying a legacy is used in the form of recall of facts about the hero. To the extent that legacies can be established and perpetuated by people remembering details about the hero, accurate recall of information concerning the hero may provide a way to clear feelings of indebtedness as their legacy is living on “in people’s mind” i.e., in their memory. In addition, Study 3 includes two tasks similar to those in Study 2, namely the plaque task and the financial reward task.

It is hypothesized that after considering a hero who has not been repaid (vs. has been repaid) for their contributions, that accurate recall of information about their life will be greater. Further, it is hypothesized that an unrepaid hero will motivate selection of more durable material for a commemorative plaque, and, potentially (given findings of previous studies), greater financial repayment.
Method

Participants. One hundred-twenty participants (male = 82, female = 38, age $M$: 34.05, $SD$: 10.95) participated via Amazon Mechanical Turk and were compensated $1.88.

Materials

Hero manipulation. After the BJWS ($\alpha$ = .85) and indebtedness measures ($\alpha$ = .77), to manipulate thoughts of a hero who had (vs. had not) been rewarded, participants completed an ostensible reading task consisting of the following passage (rewarded condition): “Yvonne Lawler (born 10.10.1920) was a Belgian holocaust rescuer educated in Switzerland. Her efforts secured the lives of 214 Jews previously held in a concentration camp near Babi Yar. She conducted the rescue in the summer of 1947 and was said to have brilliant green eyes and brown hair. For her actions, she was awarded the prestigious Carnegie medal of heroism.” The unrewarded condition replaced the sentence concerning the award of a medal with “Despite her actions, she received little recognition or reward.”

Delay task. To allow a gap between the information presented and recall, a delay task used in previous research (Greenberg et al., 1994) was included, ostensibly as a continuation of the “reading task”. This presented a short one-page extract from Camus’ (1958) Exile and the Kingdom followed by two filler questions. The first was a 10-point Likert type question “How do you feel about the overall descriptive qualities of the story?” ($1$ – not at all descriptive, $10$ – very descriptive). The second asked “Do you think the author of this story is male or female?” (male/female). This task typically takes between 3 – 7 minutes (Burke et al., 2010).

Recall task. Following the delay task participants completed a 10-item multiple choice questionnaire. This asked participants to recall details from the
reading task. Instructions read “Please answer as accurately as you can what you think were the correct details about the holocaust rescuer you read about”. Example items include “Her name was” (Yvonne Lawler, Yvette Lawler, Yvonne Lavette, Lawler Yvette), and “She had _______ eyes” (Grey, Blue, Green, Brown).

**Plaque task and financial repayment task.** Participants then completed the plaque and financial repayment task, presented in random order, as in Study 2 with one exception. The financial repayment task’s scale was altered, to reflect a more direct reward rather than lifetime earnings: “How many dollars do you think the holocaust rescuer deserves as a reward for her actions? I think this person deserves $____________ as a reward”. The scale also changed to a 10-point Likert type scale with increments of $10,000 dollars (1 - $10,000, 10 – $100,000).

**Results**

**Recall task.** The number of details correctly remembered served as the primary dependent variable. This was submitted to a one-way (unrepaid/repaid hero) ANOVA which revealed an effect, $F(1,118) = 4.88, p =.03, \eta^2_p = .04$, such that after reading about the hero who was not repaid the number of details correctly recalled was greater ($M = 8.30 ; SD = 1.83$), than after the repaid hero ($M = 7.43 ; SD = 1.93$). The results hold when removing Jewish participants, $F(1, 116) = 4.83, p =.03, \eta^2_p = .04$.

**Plaque task.** After checking for order effects on the plaque task and financial repayment task (all $Fs < 1.01$, all $ps > .32$), responses on the plaque task were submitted to a one-way ANOVA which revealed no effect, $F(1,118) = .28, p =.6, \eta^2_p < .01$.

**Financial repayment task.** Responses on the financial repayment task were submitted to a one-way ANOVA which revealed no effect, $F(1,118) = .08, p =.79, \eta^2_p <.01$. 
Study 3 provides support for the hypothesis that consideration of an unrepaid (vs. repaid) hero leads to greater accurate recall of information pertaining to them; which may potentially function to repay the hero by facilitating their legacy, thus clearing feelings of debt. No effects were found on either the plaque task, or the financial task. One possible explanation for these null results is that the act of recalling more information about the unrepaid hero satiated the goal of repaying them, negating the need for further repayment.

General Discussion

The present research offers a LAST model perspective on the relationship between heroic contributions, indebtedness, and legacy conferral. Three primary studies explored the possibility that thoughts of heroes who are not repaid for their contributions motivate repayment, specifically via the bestowing of a legacy on the hero, presumably as a way to clear feelings of indebtedness and avoid negative psychological consequences associated with such indebtedness.

A preliminary study provided initial support for a basic tenet of the LAST model, finding that writing about an unrepaid hero (vs. a celebrity, or, a repaid hero) resulted in greater feelings of indebtedness. Study 1 built on the preliminary study, to examine whether thoughts of a hero, operationalized as a medical pioneer who saved countless lives, who was unrepaid led to greater transgression tolerance. Results provided some evidence in support of this hypothesis. Participants responded with a less severe punishment (and thus greater transgression tolerance) for the unrepaid (vs. repaid) hero who was arrested for being drunk and disorderly. However, clear effects only emerged on the fine amount measure, and not the jail term measure. Probing the data revealed the lack of effect on the jail term measure was likely due to a relative floor effect, suggesting it was not a sensitive tool with which to detect the potential
impact of the hero manipulation, perhaps because an extended jail term for being drunk and disorderly in public may be judged as excessive.

Study 2 examined whether being led to consider a personal hero (vs. a celebrity), and then being led to feel indebted (vs. not) to them via an ease of retrieval manipulation, motivates greater desire to confer a legacy. Legacy was measured via endorsement of including the hero/celebrity in a book of the “1000 greatest people ever”, and, via the choice of material for a hypothetical plaque, with the material choices having varying durability. Additionally, the study included measures of self-esteem and negative affect to examine the potential negative consequences of presumably feeling indebted to a hero. Finally, the study aimed to build on Study 1 to further scrutinize the LAST models proposition that monetary reward was not a viable method for clearing feelings of indebtedness by including another financial repayment task.

The results of Study 2 were mixed. Main effects emerged on the plaque and book tasks such that after consideration of a hero, participants selected a more durable material for a plaque being established for the hero, and, a greater willingness to include the hero in a book of the “1000 greatest people ever” – measures designed to assess conveying a legacy. In addition, interactive effects did emerge on the financial repayment task. Specifically, when confronted with a more difficult retrieval task (thus potentially prompting feelings of indebtedness), participants thought a hero (vs. celebrity) should receive greater lifetime earnings. No such effect was found in the presumably easier retrieval conditions. Taken together these findings suggest that consideration of heroes may prompt people to attempt to award them a legacy, and that when debt is potentially more salient, they respond with greater efforts to repay the hero.
Assuming the retrieval manipulation did effectively induce feelings of indebtedness, the results concerning the financial repayment task might be interpreted as providing evidence for the differentiation of psychological reactions to heroes and celebrities (North et al., 2005), as responses to feelings of indebtedness yielded differential indications of deserved financial repayment. In particular it may be that when a hero is brought to mind, and a person feels indebted to them, desire to repay the hero financially is greater as they feel they deserve such repayment. In comparison, participants presumably led to feel indebted to a celebrity indicated they deserved a lesser monetary reward. One framework offering a potential explanation of these findings is just world theory (Lerner, 1980) and its possible differential applicability to heroes and celebrities. The gist of the theory is succinctly captured in the quip “people get what they deserve, and deserve what they get”. The former phrase may be more applicable to heroes, i.e., in the event that a person is indebted to them, they get what they deserve for their contributions (more money). The latter phrase may be more applicable to celebrities i.e., I have repaid them so they deserve what they get (more money), or, I have not repaid them so they deserve what they get (less money). In other words, for heroes, people may be motivated to repay contributions (they are deserving of reward and so get it), but for celebrities, the repayment of contributions (or lack thereof) may prompt continued repayment commensurate with previous rewarding (they have been getting rewarded/not, and so, the rewarding vs. not is perpetuated, as it is presumably deserved).

Considering the variations in the number of responses given on the ease of retrieval as function of the heroism/celebrity manipulation in Study 2 introduces further ambiguities. In the hero condition, participants provided more responses and thus presumably a greater number of repayments, across easy and difficult retrieval
conditions, in comparison to the celebrity condition; this might provide one explanation for the absence of interactive effects on measures of legacy. Specifically, if participants were motivated to direct greater effort at recalling ways they have repaid a hero, but not a celebrity, then it is possible that such efforts represent a repayment, meaning no negative psychological consequences were experienced and thus no interactive effects on legacy measures as such consequences were not induced.

No effects on the hypothesized negative psychological consequences (lower self-esteem, greater negative affect) of considering a hero and being led to feel indebted to them were found, and they did not mediate effects on the dependent variables. The absence of effects on self-esteem and negative affect may also relate to the above reasoning concerning the retrieval task. If a person felt they had repaid a hero, such negative consequences may have been circumvented as they did not feel indebted. Further, the absence of mediation by negative psychological consequences on legacy measures may relate to dependent measure sensitivity issues, the potential lack of efficacy for the retrieval task to induce feelings of indebtedness, or the recall of more repayments on the retrieval task in the hero condition buffering against experiencing negative psychological outcomes. However, if one assumes the retrieval task did successfully induce indebtedness, the absence of mediation might suggest the LAST model is simply incorrect.

Study 3 examined whether thoughts of a hero, operationalized as a holocaust rescuer, who was unrepaid led to greater motivation to award them a legacy, operationalized as greater accurate recall concerning details of her life, and awarding of a more durable plaque material. In addition, a financial reward task was included, as with Study 2, to examine the LAST models increasingly shaky claim (given results
of previous studies) concerning money as an unviable method to repay indebtedness induced by an unrepaid hero. No effects were found on either the plaque task, or the financial reward task. However, recall of accurate details were found when participants read about an unrepaid (vs. repaid) hero.

Taken together these studies provide mixed evidence for the LAST model, and highlight two potential considerations for refinement of the theory. The first concerns the viability of financial repayment for clearing feeling of debt incurred by a heroic contribution. The second concerns the potential need for a personal repayment to clear feelings of indebtedness, and the role of memory in repayment/conferring a legacy.

Despite the initial conceptualization of the LAST model positing financial reward as an unsuitable repayment mechanism, evidence suggests financial repayment may actually be implicated in clearing feelings of indebtedness. Study 1 found a reduced fine amount for an unrepaid heroic contribution, and Study 2 found greater monetary earnings endorsed for a hero to whom people may have felt indebted. A consideration of how the LAST model may potentially be refined to accommodate financial repayment is thus warranted. One possibility is that the LAST model is wrong to assume money’s utility as a method of repayment is insufficient, as its value to the individual is reduced to zero on the hero’s death (given they cannot use it), it provides no acknowledgement of the hero’s identity or accomplishments (as would a statue or plaque for example), and its value can fluctuate (meaning the value repaid may suddenly be in excess, or worse, inadequate). Another way to look at this issue is that money can provide value to a hero beyond their death. Such value can be construed as operating in two modes, one tangible and another symbolic. Concerning the former, money offers tangible repayment via legacy, for example, by generatively offering the hero’s descendants a comfortable living, a greater quality of life, or the
money being donated to a charity that provides future aid for a cause the hero supports.

On the symbolic level, money can also be used to provide acknowledgement of a hero’s identity and accomplishments, for example, if a scholarship bearing their name is set up with their funds it may be to build on their own area of accomplishments (business, science, economics), or if the money is used to erect a building it may also carry their name. Indeed, much research points to the symbolic value of money (e.g., Zhou, Vohs, & Baumeister, 2009) and the benefits of the liquidity of its value, i.e., its unit-value is not tied to a domain but is rather capable of substitution for other kinds of value, for example, it may be used to procure food, property, or services. The symbolic liquidity of its value appears to extend to psychological realms. Findings show that handling money (vs. paper) reduces distress over social exclusion, and even diminishes the physical pain of immersion in hot water (Zhou et al., 2009). This suggests that the contributions gleaned from heroes might be suitably repaid via the symbolic value of money. In addition, money might not only provide symbolic value, but also symbolic immortality as alluded to by studies conducted from a terror management perspective (Greenberg, Pyszczynski, & Solomon, 1986; see e.g., Arndt et al., 2004). According to the theory reminders of death spur people to attain standards of worth, and prompts legacy striving, which confers a feeling of existential security. Research demonstrates how money may be implicated in legacy striving, as reminders of mortality leads participants to: hypothetically donate more money to a future (vs. present) oriented charity (Wade-Benzo, 2012), overestimate the size of coins and monetary notes, desire greater financial compensation, and that priming participants with the concept of money reduces self-reported fear of death (Zaleskiewicz, Gasiorowska, Kesebir,
Luszczynska, & Pyszczynski, 2013). Further, not only is the pursuit of money and spending money associated with existential security, saving money has also been argued to provide existential security. Zaleskiewicz, Gasiorowska, and Kesebir (2013), for example, found that reminders of mortality spurred frugal behavior, and that participants primed with the saving of money reported lower fear of death. Collectively, findings point to the capacity for money to provide a legacy in a number of ways either through generative acts (donating to a future charity), or attaining a symbolic immortality (achieving culturally delineated values). It is important to note that the distinction between the tangible and symbolic ways money may be used to attain a legacy is not an either/or distinction and it may act in both ways simultaneously.

The original conceptualization the LAST model also highlighted a limitation for money to act as an effective repayment technique being its fluctuating value. However, such value fluctuates, at least from an economic perspective, unanimously. As such, the relative value remains the same across all members using a given currency and thus, in one way, the meaning of such value does not change with fluctuations as it is a comprehensive unit change applicable to all.

Regarding personalized repayment and memory, the LAST model proposes that legacies can live on in people’s minds, but as currently formulated, is unspecific about how this occurs. Study 2 alludes to the possibility that thoughts about a hero can motivate greater retrieval of instances in which repayments have been made to a hero, and Study 3 found greater recall of accurate information for an unrepaid (vs. repaid) heroic contribution. Consequently, one mechanism through which people may manage feelings of indebtedness concerning heroes is through motivated encoding and/or remembering of their achievements. Indeed, such remembering may represent
a particularly efficient form of repaying felt debt as it is requires personal psychological involvement (the individuals attention and memory), and potentially expenditure of personal psychological resources and effort. Such theorizing is consistent with the reciprocity principle in that the parties involved in the transaction are the hero and the self. To this end, the repayment should come from the individual who received the contributions, and not, from a general repayment from a party uninvolved in the transaction (as the establishment of a durable plaque, or, inclusion in a book would – as these measures require little to no effort on the individuals part). As a result, the theory might be refined to specify that indebtedness may be circumvented by conferring legacies as facilitated by memory processes. Extant research hints at the benefit of this potential refinement, finding negative affective states can motive the retrieval of positive events (McFarland & Buehler, 1997). To the extent that a person is led to consider their heroes and then led to feel indebted to them, such negative affect may encourage the retrieval of memories that speak to how an individual has repaid them (as such repayments would represent a positive event). Future studies might more comprehensively examine the potential for heroes to motivate both encoding and recall.

Another potential future direction that might augment our understanding of how heroic contributions are repaid may consider the possible role of individuals’ need for closure (Kruglanski, Webster, & Klem, 1993). The need for closure refers to the desire an individual has for order, predictability, decisiveness, and their discomfort with ambiguity. To the extent that individuals high in need for closure exhibit a tendency to maintain order, they may be more motivated to repay heroic contributions, as the structure the reciprocity principle affords is appealing to them. Consequently, by repaying debt incurred by heroic contributions they both reinforce
structure and avoid the ambiguity potentially incurred by violating the reciprocity principle. Further, research finds those high in need for closure, or induced to feel a lack of closure, exhibit extensive processing of information if it will lead to the desired cognitive end-state i.e., closure (Kruglanski, Peri, & Zakai, 1991). When considering the greater number of details recalled for the unrepaid hero in Study 3, one possibility is that the incomplete transaction functioned to engender a lack of closure, motivating individuals to direct psychological resources towards encoding and retrieval of information pertaining to unrepaid hero as a way to attain closure.

Coda

The present research stems from rhetoric surrounding heroes that often implies people are indebted to them, and that they deserve to be remembered. An overarching question probed the psychological reality of these claims: are legacies awarded to heroes as a way to clear feelings of debt elicited by their contributions? Using hypotheses derived from the LAST model (McCabe, 2015), three studies informed this question. Results highlight how thoughts of unrepaid heroes can result in feelings of indebtedness, a greater tolerance for their transgressions, and greater motivations to award them legacy via endorsement of legacy bestowing mediums including greater memory of them and their deeds. Implications are discussed for two potential refinements to the LAST model. The first, regards allowing monetary reward to act as viable method for clearing feelings of debt, and the second, highlights the role of motivated encoding and retrieval of information pertaining to the hero in clearing feelings of debt, and potentially, legacy facilitation. Such refinements are argued to advance the model, allowing a closer fit with the data collected, and consequently, subsequent studies derived from the LAST model have continued merit.
END NOTES

1. Throughout this article I use the term hero to denote both heroes and heroines.

2. Prior to the explicit measures of indebtedness participants completed a measure design to act as a manipulation check for the heroism exposure, and to assess debt-related cognitions—a 40-item word stem completion task. The first item was _ERO, allowing an indication of the accessibility of hero-related cognition (HERO) or not (ZERO/AERO etc.), and then eleven debt-related word stems were included among neutral word stem completions, allowed for an indication of the accessibility of debt related cognition. These stems were: DE_ _ (DEBT/DEAL), _E_A_ (REPAY/Delay), _AY (PAY/DAY), _ _ _MENT (PAYMENT/RAIMENT), _ILL (BILL/KILL), _EE (FEE/SEE), OW_ (OWE/OWL), D_ES (DUES/DIES), _OST (COST/HOST), _OAN (LOAN/MOAN), and _ONEY (MONEY/HONEY). However, no effects approached significance.

3. Complete materials for this and the subsequent studies are included in Appendix 1.

4. To examine if motivations to clear feelings of debt are stronger for those with greater beliefs in a just world, the belief in just world scale BJWS (Rubin & Peplau, 1975) was included before manipulations in all studies. This 20-item, 6–point Likert type scale assesses people’s belief that the world is a just place. The instructions state “Read each statement and then rate your agreement using the scale below. Please write the number in the blank beside the statement.” Example items include “Basically, the world is a just place”, and, “By and large, people deserve what they get” (1- Strongly disagree, 6 – Strongly agree; α=.83). In addition, to examine if motivations to clear feelings of debt are stronger for those with greater concerns about indebtedness, the indebtedness scale (Greenberg & Westcott, 1983) was included before manipulations in all studies. This 11-item, 6–point Likert type scale was
designed to assess a person’s concerns about indebtedness broadly. Sample items include “I get very upset when I discover I have forgotten to return something I have borrowed” and “Owing someone a favor makes me uncomfortable” (1 – *Strongly disagree*, 6 – *Strongly agree*; α = .76). Individual differences in belief in a just world and indebtedness did not moderate any of the effects presented (ps > .18), and are thus not discussed further.

5. Note: data violated the Levene’s test for homogeneity of variance. However, because sample size was even between cells the ANOVA was robust to violations of this assumption, thus no remedial measures were pursued (Maxwell & Delaney, 1990).

6. The various orders the dependent variables were completed in were examined to search for order effects; conceptually, to test whether responses to measures immediately after manipulations captured effects which may have negated the need for further forms of repayment, or muted further negative psychological consequences. No order effects emerged for any of the DVs (Fs < .21, ps > .65).

7. Because of the differences in number of responses to the ease of retrieval task, mediational models were pursued for all DVs with hero/celebrity manipulation as the IV and number of retrievals as the mediator. No effects were found. In addition, for the same reason, a multiple regression approach was pursued (Aiken & West, 1991) with the hero/celebrity manipulation as the categorical variable, and number of responses as the continuous variable being regressed on all DVs. Again, no effects were found. Finally, all analyses reported hold when controlling for number of responses on the retrieval task.
REFERENCES


Figure 1. Perceived heroism as a function of writing task. (Preliminary Study)
Figure 2. Indebtedness as a function of writing task (Preliminary Study)
Figure 3. Financial repayment as a function of considering a hero (vs. celebrity) and high (vs. low) indebtedness (Study 2)
Appendix 1. Study materials

Belief in a just world scale (Rubin & Peplau, 1975) - all studies

Read each statement and then rate your agreement using the scale below. Please write the number in the blank beside the statement.

1 2 3 4 5 6

strongly disagree strongly agree

___ 1. I’ve found that a person rarely deserves the reputation he has.
___ 2. Basically, the world is a just place.
___ 3. People who get “lucky breaks” have usually earned their good fortune.
___ 4. Careful drivers are just as likely to get hurt in traffic accidents as careless ones.
___ 5. It is a common occurrence for a guilty person to get off free in American courts.
___ 6. Students almost always deserve the grades they receive in school.
___ 7. Men who keep in shape have little chance of suffering a heart attack.
___ 8. The political candidate who sticks up for his principles rarely gets elected.
___ 9. It is rare for an innocent man to be wrongly sent to jail.
___ 10. In professional sports, many fouls and infractions never get called by the referee.
___ 11. By and large, people deserve what they get.
___ 12. When parents punish their children, it is almost always for good reasons.
___ 13. Good deeds often go unnoticed and unrewarded.
___ 14. Although evil men may hold political power for a while, in the general course of history good wins out.
___ 15. In almost any business or profession, people who do their job well rise to the top.
___ 16. American parents tend to overlook the things most to be admired in their children.
___ 17. It is often impossible for a person to receive a fair trial in the USA.
___ 18. People who meet with misfortune have often brought it on themselves.
___ 20. Many people suffer through absolutely no fault of their own.
Greenberg & Westcott indebtedness scale (1983) – all studies

Please read each of the statements below, and indicate your level of agreement using the following scale. Remember, there are no right or wrong answers.

1. 2. 3. 4. 5. 6.

strongly disagree strongly agree

1. ___ If someone saves your life, you are forever in their debt.
2. ___ One should return favors from a friend as quickly as possible in order to preserve the friendship.
3. ___ Owning someone a favor makes me uncomfortable
4. ___ One should not borrow money from a friend unless it is absolutely necessary.
5. ___ Asking for another’s help gives them power over your life.
6. ___ Never a borrower or a lender be.
7. ___ I’d be embarrassed if someone had to remind me of a debt I owed them.
8. ___ As a rule, I don’t accept a favor if I can’t return the favor.
9. ___ If someone pays for my dinner or invites me to their place, I feel obligated to buy them dinner the next time or to invite them to my place.
10. ___ I get very upset when I discover I have forgotten to return something I have borrowed.
11. ___ If someone goes out of their way to help me, I feel as though I should do more for them than merely return the favor.
**Demographics – all studies**

In your own words, what was the purpose of the experiment?

____________________________________________________________________

Do you have any thoughts or feelings about this experiment?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

Have you been in any other experiment that was similar to this experiment?

Yes 
No

If yes, please explain________________________________________________________

____________________________________________________________________

1.) What is your sex? _____Male _____Female

2.) Age? __________

3.) What is your ethnicity?

   1. Hispanic/non-white or Latino

   2. non-Latino

4.) What is your race?

   _____1. Caucasian  _____4. American Indian/Native Alaskan

   _____2. African American  _____5. Asian

   _____3. Hawaiian/Pacific Islander  _____6. Other: ___________________

5.) What religion/philosophy are you affiliated with, if any:

   1. Christian  5. Jewish

   2. Hindu  6. Atheist

   3. Buddhist  7. Agnostic

   4. Muslim  8. Other: ___________________

6.) Please indicate the total number of years of education you have completed:

____________________________________________________________________

(for example: high school graduation is 12yrs., so two years of college is 14yrs.)
**Insulin inventor task – Study 1**

In 1869, while studying the structure of the pancreas under a microscope, Paul Langerhans, a medical student in Belin, discovered insulin. The discovery went on to help millions of people who suffer diabetes and save countless lives. He was awarded several prestigious medals and awards for his contributions to science. Langerhans personal life was fraught with personal issues. He was an alcoholic and his wife's diary tells us he regularly drank to the point of passing out.

In 1869, while studying the structure of the pancreas under a microscope, Paul Langerhans, a medical student in Belin, discovered insulin. The discovery went on to help millions of people who suffer diabetes and save countless lives. Despite this, he is rarely credited with the discovery and received no recognition for his contributions to science. Langerhans personal life was fraught with personal issues. He was an alcoholic and his wife's diary tells us he regularly drank to the point of passing out.
Transgression task – Study 1

On the 3rd of June, 1873, Paul Langerhans was arrested and taken to the county jail for being drunk and disorderly in public. The minimum jail sentence at that time was one week, and the maximum was 10 weeks. If you were the judge, how many weeks would you place Paul Langerhans in jail for?

1 2 3 4 5 6 7 8 9 10

In addition to the jailing term, a fine was also levied on Paul Langerhans. At the time, the minimum fine was equivalent to $50, and the maximum was $500. If you were the judge, how much would you fine Paul Langerhans?

$50 $100 $150 $200 $250 $300 $350 $400 $450 $500
**Hero task – Study 2**

This assessment is a recently developed, innovative personality assessment. Recent research suggests that feelings and attitudes about significant aspects of life tell us a considerable amount about the individual’s personality. Your responses to this survey will be content-analyzed in order to assess certain dimensions of your personality. Your honest responses to the following questions will be appreciated.

In the space below please think about your favorite hero (an actual person) and write down who this person is and the thoughts and feelings this person arouses in you. My favorite hero is:__________________________

The thoughts and feelings this person arouses in me are:

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________
Celebrity task – Study 2

This assessment is a recently developed, innovative personality assessment. Recent research suggests that feelings and attitudes about significant aspects of life tell us a considerable amount about the individual’s personality. Your responses to this survey will be content-analyzed in order to assess certain dimensions of your personality.

Your honest responses to the following questions will be appreciated.

In the space below please think about your favorite celebrity and write down the thoughts and feelings this person arouses in you.

My favorite celebrity is:__________________________

The thoughts and feelings this person arouses in me are:

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________
Ease of retrieval task – Study 2

When you think about the person you wrote about on the previous page, in what ways have you given back to them? In the space below please list as many ways as you can that you’ve given back to your favorite hero (5 vs. 20)

1. ____________________________________________
2. ____________________________________________
3. ____________________________________________
4. ____________________________________________
5. ____________________________________________
6. ____________________________________________
7. ____________________________________________
8. ____________________________________________
9. ____________________________________________
10. ____________________________________________
11. ____________________________________________
12. ____________________________________________
13. ____________________________________________
14. ____________________________________________
15. ____________________________________________
16. ____________________________________________
17. ____________________________________________
18. ____________________________________________
19. ____________________________________________
20. ____________________________________________
Negative affect scale – Study 2

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now. Use the following scale to record your answers.

1  2  3  4  5
Very slightly a little moderately quite a bit extremely

___sad
___blue
___downhearted
___alone
___lonely
___guilty
___ashamed
___blameworthy
___angry at self
___disgusted with self
___dissatisfied with self
**Self-esteem scale – Study 2**

This questionnaire is designed to give a better picture of you as an individual. Enter the number in the space provided that most accurately describes how you feel about yourself right now. Please answer as truthfully as possible.

1 = Strongly Disagree  
2 = Disagree  
3 = Agree  
4 = Strongly Agree

_____ I feel that I am a person of worth, at least on an equal basis with others.  
_____ I feel that I have a number of good qualities.  
_____ All in all, I am inclined to feel that I am a failure.  
_____ I am able to do things as well as most other people.  
_____ I feel I do not have much to be proud of.  
_____ I take a positive attitude toward myself.  
_____ On the whole, I am satisfied with myself.  
_____ I wish I could have more respect for myself.  
_____ I certainly feel useless at times.  
_____ At times I think I am no good at all.
Plaque task – Study 2

Imagine that a new plaque is going to be established for the hero/celebrity you wrote about on the previous screen. Below are the descriptions of a variety of materials. Which material do you think the plaque should be made out of? (please select one)

Copper – typically lasts 50 years.

Steel – typically lasts 100 years.

Aluminum – typically lasts 150 years.

Titanium – typically lasts 200 years.
**Inclusion in book task – Study 2**

Imagine that a publisher wants to create a book listing the 1000 greatest people ever. How much do you think the person you wrote about deserves to be included in the book?

1 2 3 4 5 6 7 8 9 10

Absolutely should not be included Absolutely should be included
Financial repayment task- Study 2

How many dollars do you think the person that you previously wrote about deserves to have in their lifetime? The average person earns $2,000,000, in their lifetime.

I think this person deserves_______________ in their lifetime. (please select one)

$500,000  $1,000,000  $1,500,000  $2,000,000  $2,500,000  $3,000,000

$3,500,000
Holocaust task – Study 3

Yvonne Lawler (born 10.10.1920) was a Belgian holocaust rescuer educated in Switzerland. Her efforts secured the lives of 214 Jews previously held in a concentration camp near Babi Yar. She conducted the rescue in the summer of 1947 and was said to have brilliant green eyes and brown hair. For her actions, she was awarded the prestigious Carnegie medal of heroism.

Or Despite her actions, she has received little recognition or reward.
Reading task – Study 3

Please read the following short passage from a novel and answer the questions that follow.

The automobile swung clumsily around the curve in the red sandstone trail, now a mass of mud. The headlights suddenly picked out in the night—first on one side of the road, then on the other—two wooden huts with sheet metal roofs. On the right near the second one, a tower of course beams could be made out in the light fog. From the top of the tower a metal cable, invisible at its starting-point, shone as it sloped down into the light from the car before disappearing behind the embankment that blocked the road. The car slowed down and stopped a few yards from the huts.

The man who emerged from the seat to the right of the driver labored to extricate himself from the car. As he stood up, his huge, broad frame lurched a little. In the shadow beside the car, solidly planted on the ground and weighed down by fatigue, he seemed to be listening to the idling motor. Then he walked in the direction of the embankment and entered the cone of light from the headlights. He stopped at the top of the slope, his broad back outlined against the darkness. After a moment he turned around. In the light from the dashboard he could see the chauffeur’s black face, smiling. The man signaled and the chauffeur turned off the motor. At once a vast cool silence fell over the trail and the forest. Then the sound of the water could be heard.

The man looked at the river below him, visible solely as a broad dark motion flecked with occasional shimmers. A denser motionless darkness, far beyond, must be the other bank. By looking fixedly, however, one could see on that still bank a yellowish light like an oil lamp in the distance. The big man turned back toward the car and nodded. The chauffeur switched off the lights, turned them on again, then blinked them regularly. On the embankment the man appeared and disappeared, taller and more massive each time he came back to life. Suddenly, on the other bank of the river, a lantern held up by an invisible arm back and forth several times. At a final signal from the lookout, the man disappeared into the night. With the lights out, the river was shining intermittently. On each side of the road, the dark masses of forest foliage stood out against the sky and seemed very near. The fine rain that had soaked the trail an hour earlier was still hovering in the warm air, intensifying the silence and immobility of this broad clearing in the virgin forest. In the black sky misty stars flickered.

How do you feel about the overall descriptive qualities of the story?

1  2  3  4  5  6  7  8  9
not at all somewhat very
descriptive descriptive descriptive

Do you think the author of this story is male or female?

_______ male    _______ female
Holocaust memory task – Study 3

Please answer as accurately as you can what you think were the correct details about the holocaust rescuer you read about. (PRESENTED RANDOMLY)

1. Her name was
   a. Yvonne Lawler
   b. Yvette Lawler
   c. Yvonne Lavette
   d. Lawler Yvette

2. She was born in
   a. 10.10.1920
   b. 11.11.1920
   c. 12.12.1920
   d. 9.9.1920

3. She was from:
   a. Belarus
   b. Bydgoszcz
   c. Belgium
   d. Berlin

4. She saved the lives of how many Jews
   a. 212
   b. 213
   c. 214
   d. 215

5. The Jews were held at a concentration camp near
   a. Bila Tserkva
   b. Babi Yar
   c. Brussels
   d. Basel

6. The rescue was conducted in:
   a. 1945
   b. 1946
   c. 1947
   d. 1948
7. She had _______ eyes
   a. Grey
   b. Blue
   c. Green
   d. Brown

8. She had _______ hair
   a. Black
   b. Blonde
   c. Brown
   d. Red

9. She was educated in:
   a. Sweden
   b. Switzerland
   c. Spain
   d. San Marino

10. The rescue was conducted in:
    a. Spring
    b. Summer
    c. Fall
    d. Winter
Plaque task – Study 3

Imagine that a new plaque is going to be established for the holocaust rescuer at the site of the rescue. Below are the descriptions of a variety of materials. Which material do you think the plaque should be made out of?

Copper – typically lasts 50 years.

Steel – typically lasts 100 years.

Aluminum – typically lasts 150 years.

Titanium – typically lasts 200 years.
Financial repayment task – Study 3

How many dollars do you think the holocaust rescuer deserves as a reward for her actions?

I think this person deserves $____________ as a reward.

$10,000  $20,000  $30,000  $40,000  $50,000
$60,000  $70,000  $80,000  $90,000  $100,000
VITA

Simon McCabe was born and raised in Birmingham, England; a son to Yvonne and John McCabe, and brother to Jennie and Helen McCabe. Among Simon’s many interests are football, music, film, and history. He earned his B.A. from the University of Wolverhampton in English Language and Literature combined with Psychology, and his M.Sc. in Psychology from the University of Chester.