ALL WORK AND NO PAY?
EFFECTS OF REWARD STRUCTURES ON PERCEPTIONS OF SOCIAL MOBILITY IN THE UNITED STATES

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Abstract

Perceptions of social mobility and the belief that hard work leads to rewards have been linked with a number of individual differences, such as ideology, education, and socioeconomic status. However, as individuals often generalize their own experiences to perceptions of others, lived experiences are likely to also play an important role in shaping beliefs about social mobility. I test this theory in an online game paradigm adapted from previous research on scarcity (Shah, Mullainathan, & Shafir, 2012). In four studies, participants played a "Family Feud-style" quiz game in which points were awarded for correct answers. Participants could choose to answer from three to fifty-seven questions, and those who accumulated the most points were entered into a raffle for $50. In one condition, effort was increasingly rewarded by a scaling reward system in which each question was worth more points than the previous. I find that participants whose perseverance is rewarded in this way generally feel more personal control and perceive higher social mobility in the U.S. compared to participants whose potential points were held constant across questions, or determined randomly for each question. However, the statistical significance of this pattern was inconsistent across studies. This set of studies provides preliminary evidence that perceptions of social mobility can be shaped by even brief experiences in the context of an experiment; further research will clarify this effect.
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All Work and No Pay? Effects of Reward Structures on Perceptions of Social Mobility in the United States

In the United States, if you work hard, you can get ahead in life -- or at least, so most people believe (Kluegel & Smith, 1986; TW Smith, Hout, & Marsden, 2013). Rags-to-riches stories are captivating and inspirational -- the drive to “pull yourself up by your own bootstraps” seems admirable and evidence of good character (Furnham & Procter, 1989; Kluegel & Smith, 1986).

But does hard work always lead to success in our current society? The following section will briefly overview previous research describing how people's attitudes and social status influence their answer to this question. What is less explored in the existing literature is how past experiences with the world shape beliefs about this contingency between hard work and rewards.

My research focuses on how individual experiences can influence beliefs about the relationship between effort and rewards, both for the individual and for society in general. A series of studies suggests that experience with different reward structures may help shape these kinds of views, and that the feelings of control or constraints inspired by these reward structures may play an important role in this process.

Introduction

How do people form beliefs about society? They may draw their views from popular narratives, shaped by the stories they see around them. Alternatively, they may subscribe to particular views that justify their position in the social hierarchy, or motivate them to try to improve it. Finally, they may generalize their own experiences, inferring that what they have experienced is common to others as well. In this paper, I will discuss
some common views about social mobility, reviewing related literature from a number of different domains. Then, with a series of two pilot studies and four experimental studies, I will show how experience with reward structures can influence effort-reward beliefs about society and perceptions of social mobility.

**Societal Beliefs About Mobility**

In the United States, examples of upward social mobility are pervasive in the media; most Americans are extensively exposed to the idea that anyone can get ahead as long as they work hard enough (McCoy & Major, 2007). This theme underlies many of the most popular media narratives, including children's stories and fairy tales (e.g., *The Little Engine that Could*, Bottigheimer, 1994; Piper, 1976), movies (e.g., *The Pursuit of Happyness*, Muccino, 2007), and music (e.g., "Started from the Bottom," Drake, Coleman, & Shebib, 2013). Stories promoting this message revere those who have worked their way up from humble origins to reach the most exalted heights of the social hierarchy, and hold these individuals up as motivating exemplars of success (e.g., Liberman & Lavine, 2000). Much is made of businessmen such as Sam Walton, who was born into a humble farming family and then went on to such success with his Walmart stores that he became one of the richest individuals in the world ("Sam Walton: On a wing and a prayer," 2003). These stories are often used as evidence that the "American Dream" of working one’s way up in society is indeed achievable; one such piece in Forbes magazine claims examples such as Walton are "proof that it is possible to overcome life's toughest challenges and create something better for yourself" (Goldschein & Eisenberg, 2011).
While these types of narratives are often used to inspire others to work hard (Auvinen, Aaltio, & Blomqvist, 2013; Baek, 2006; Barker & Gower, 2010), they also obscure the unfortunate reality that upward social mobility is becoming increasingly rare in our socially-stratified society, as will be shown later in this introduction (e.g., Kopczuk, Saez, & Song, 2010). By focusing on examples of upward social mobility and highlighting the role of individuals' internal characteristics in helping them succeed, popular discourse glosses over the large majority of other people who are not able to accomplish these great feats of mobility. It is not surprising, therefore, that Americans consistently overestimate the amount of upward social mobility in current society (Kraus & Tan, 2015), generally believe that they or their children will move up the social ladder (Benabou & Ok, 2001), underestimate the amount of downward mobility in society (Davidai & Gilovich, 2015), and underestimate overall income inequality (Norton & Ariely, 2011).

**Meritocracy Beliefs**

The general theme that those with laudable internal characteristics, such as ambition and tenacity, can get ahead in society is reflected in the idea of meritocracy.Meritocracy, sometimes referred to as the "dominant ideology" of the United States, refers to a system in which social outcomes are determined by the inputs of effort and ability (Kluegel & Smith, 1986; McCoy & Major, 2007). The specific definition of those two factors is ambiguous (for example, "ability" can often be improved through training, which requires effort), but the basic idea is that in a meritocracy, resources are awarded on the basis of accomplishments.
This idea that allocations are earned by what an individual contributes is based on the principles of distributive justice, which hold that people should receive outcomes that are proportional to their inputs (e.g., Deutsch, 1975; Walster, Berscheid, & Walster, 1973). This is a core tenet of capitalism, and a principle that underlies many of our nation’s basic assumptions about how a society should function. One manner of distributive justice is provided by equity theory, which characterizes lay theories about what is fair or equitable. In psychology, equity theory posits that an outcome is “fair” if it equals rewards minus costs, proportional to inputs - as long as this calculation does not dramatically differ among individuals (for review, see Walster et al., 1973). As with meritocracy, what constitutes an "input" and a "reward" can differ. While in the workplace an input might be time spent analyzing data and a reward might be salary, in an equitable personal relationship an input might be time spent listening and a reward might be offering help on a difficult task. The specific domain affects the specific expectations, but what is important is that the outcomes are perceived as proportionate to the inputs.

In a just and equitable system characterized by meritocracy, outcomes such as social status are a fair reflection of what individuals deserve based on their effort and ability (Jost & Hunyady, 2003). Note, however, that beliefs about meritocracy consist of two distinct dimensions. The first is prescriptive beliefs, or beliefs about how things

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1 People also use the group engagement model (Blader & Tyler, 2003) to form their views of justice; according to this theory, the rewards that people receive also shape their social identities.
should be, and the second is descriptive beliefs, or beliefs about how things currently are (Son Hing et al., 2011). This dissertation focuses on descriptive beliefs, individuals’ perceptions of the current state of the world. In addition to their importance for attributions made about others, these descriptive beliefs are most related to ideologies that legitimize the status quo (Son Hing et al., 2011).

A belief that our society is currently a meritocracy implies that observed differences among people are fair, because they result from controllable factors such as effort and ability. This proportional effort-reward distribution system also assumes that individuals who want to improve their position need to increase their inputs through additional effort. Increasing belief in a meritocracy, therefore, also increases perceptions that the existing status quo is fair. For instance, when people are asked to make judgments about hypothetical societies with varying degrees of meritocracy-based resource distribution, they are significantly more tolerant of economic inequality in the societies with more meritocratic systems (Mitchell, Tetlock, Newman, & Lerner, 2003).

**Protestant Work Ethic**

The belief that hard work reaps rewards is elevated to a moral and religious imperative through the ideology of the Protestant work ethic (PWE). First proposed by Weber (1905), the ideology praises work and asceticism as high virtues and signs of divine favor (for review, see Furnham, 1984, 1990). The basic construct has several different dimensions, the most relevant here being self-reliance and the belief that hard work yields desirable outcomes (Miller, Woehr, & Hudspeth, 2002). This construct is often discussed in relation to decisions of whether or not to offer assistance to a target.
According to these ideas, both hard work and material rewards are signs of virtue and morality. This thinking has been examined largely in the context of giving aid, as those endorsing these PWE views are likely to believe that those who are disadvantaged must lack virtue, and therefore be unworthy of additional resources. Following this line of thinking, those who strongly endorse PWE tend to make more internal attributions for inequality and others' misfortune (e.g., MacDonald, 1971).

Of course, this primarily holds for those who are responsible for their low position, particularly through lack of effort. If the circumstances leading to low status are beyond an individual's control (e.g., a car accident leading to severe injury and subsequent inability to work), then the individual may instead be worthy of pity and aid (e.g., Henry, Reyna, & Weiner, 2004; Weiner, Osborne, & Rudolph, 2011; Zucker & Weiner, 1993). However, the target's adherence to the core values of PWE is still generally necessary for the target to be considered deserving of aid (Segalman, 1968). Someone who is disadvantaged through no personal fault but then does not behave virtuously is generally still considered to be unworthy of assistance.

Social Class and the Protestant Work Ethic

Protestant Work Ethic (PWE) values tend to lionize the advantaged and derogate the disadvantaged, so it is unsurprising that demographic factors have been found to correlate with these beliefs. Although the literature is far from unanimous (Beit-Hallahmi, 1979; Tang & Tzeng, 1992), recent studies suggest that endorsement of PWE is generally positively correlated with social status (e.g., Cokley et al., 2007). Several studies have examined how beliefs in PWE vary by backgrounds, ethnicities, and
experiences. Those faced with poor economic opportunities are unsurprisingly more pessimistic about their ability to achieve important financial milestones, such as homeownership; perceiving that their economic prospects are dim, they are less likely to believe that hard work will lead to success (Starks, 2003). Some studies have found that Whites tend to endorse PWE more than do Blacks, for example; researchers hypothesize that being part of a dominant ethnic majority may lead to life experiences in which working hard is more likely to lead to success (Cokley et al., 2007; Oyserman, Gant, & Ager, 1995). In the Cokley et al. study, self-perceptions of being upper class were positively associated with higher endorsement of PWE in Whites, though this relationship was not found for Blacks, consistent with PWE beliefs being most endorsed by those most advantaged.

Being employed and therefore able to earn enough to advance one’s station can also increase endorsement of PWE, which fits the overall pattern linking endorsement of meritocracy to socioeconomic status, if we consider employment as a form of status (Feather & O'Brien, 1986). In their studies, Feather and O'Brien found that those who were unemployed made more structural attributions for inequality, shifting away from the PWE values that hold individuals responsible for their place in the social hierarchies.

On the other hand, though being able to obtain employment may increase belief in PWE values, the nature of the employment may also matter. Belief in PWE can also decline with work experience, which makes sense if individuals feel unable to advance within their jobs. In one study, people who had spent less time in the workforce scored higher on PWE; the authors conclude that the experience of feeling unable to get ahead in
corporate life can contradict PWE values, making those workers less likely to endorse them (Wentworth & Chell, 1997). This suggests that it is not merely a matter of being employed or not, but rather that experience with characteristics of the system in which individuals are involved may, over time, affect their beliefs about the relationship between hard work and proportional deserved reward. Clearly, experiences and context are important in shaping these societal views.

**Belief in a Just World**

These feelings about effort and reward are closely related to a construct known as belief in a just world (BJW). First described in psychology by Lerner (1965), this refers to a general belief that the world is fair and just, and that people therefore generally get what they deserve (Lerner & Miller, 1978). Stemming from a need to perceive the world as predictable and orderly, this belief generally minimizes the negative psychological impact of systemic injustice by increasing individuals’ perceived control over their outcomes and derogating any victims of injustice. According to this belief, if the world is fair and just, then those who are disadvantaged must deserve their poor outcomes (Furnham, 2003). People who subscribe to these ideas tend to closely associate status with competence, assuming that if targets are high status, they must also be highly competent (Oldmeadow & Fiske, 2007). Conversely, if they are low status, it must be through some fault of their own and not due to any inherent disparities in the social system.

By derogating the victims in this way, the perceiver is able to feel that no injustice has actually occurred, which is much more psychologically comfortable than
acknowledging unfair outcomes. Additionally, an individual who believes in a just world therefore also believes in the personal ability to obtain deserved outcomes, which implies some degree of personal control over and predictability of the environment. These concepts fit with the findings showing BJW endorsement is correlated with life satisfaction and psychological well-being; lower belief in a just world is associated with increased risk of depression, heart disease, and other stress-related illnesses (Lipkus, Dalbert, & Siegler, 1996; Lucas, Alexander, Firestone, & Lebreton, 2008; Ritter, Benson, & Snyder, 1990). Relatedly, these beliefs in a fair world are associated with increased motivation to work hard and pursuit of long-term goals, and this relationship is especially strong for those lower in SES (Laurin, Fitzsimons, & Kay, 2011). Thus, despite the tendency of these beliefs to correlate with derogation of those who are low status, these views can still lead to positive behavioral outcomes for individuals with lower SES. Those who subscribe to the BJW principles essentially believe in a stronger correlation between effort and status, and are therefore more likely to work harder to try to achieve upward mobility.

**System Justification Theory**

Not surprisingly, Belief in a Just World, Protestant Work Ethic, and meritocracy are all highly correlated (Christopher, Zabel, Jones, & Marek, 2008; Jost, Blount, Pfeffer, & Hunyady, 2003). These ideologies can all be considered belief systems that support the current social order. To encompass these types of views under a broader umbrella, John Jost and colleagues have developed "system justification theory" (SJT) to describe
psychological motivations to endorse these types of world views that support the status quo (Jost & Banaji, 1994; Jost, Banaji, & Nosek, 2004; Jost & Hunyady, 2003, 2005).

These system-justifying needs can be increased by individual differences such as need for structure and low openness to experience, as well as situational factors such as mortality salience and perceived system instability (Jost & Hunyady, 2005). For example, people are more likely to justify the existing system when it seems stable and unlikely to change or when they feel they are unable to escape the system (Laurin, Gaucher, & Kay, 2013) or when they feel especially dependent on it (van der Toorn, Tyler, & Jost, 2011). This may be due in part to adapted coping mechanisms to deal with circumstances beyond the individual's control, as I will discuss in a later section.

**Consequences of System-Justifying Ideologies**

As discussed, beliefs that justify the social system as fair are associated with support for the status quo (Jost, Pelham, Sheldon, & Ni Sullivan, 2003). In general, these beliefs reduce insecurity and are also associated with psychological well-being and even physical health (Foster, Sloto, & Ruby, 2006; Jost & Hunyady, 2005; O'Brien & Major, 2005).

However, these positive effects of system justification generally hold more for high status individuals than those who are more disadvantaged (O’Brien & Major, 2005). This makes sense, as those who hold these views tend to be biased towards those who are higher status (Jost, Pelham, & Carvallo, 2002) and hold lower status group members responsible for their disadvantage (e.g., Cozarelli, Wilkinson, & Tagler, 2001; Katz & Hass, 1988). Thus, those who are low status and also hold system-justifying beliefs
would be likely to perceive themselves poorly due to their lack of advancement, whereas those who had attained high status could feel especially righteous for their achievements.

These victim-blaming consequences of system justification can be especially problematic in situations where aid is being distributed: When targets are seen as responsible for their own misfortune, they are more likely to be judged negatively and less likely to be offered aid (e.g., Hafer & Bègue, 2005; Kogut, 2011; Kraus & Keltner, 2013); this holds across many different types of disadvantaged statuses, including race and disability as well as SES.

Control

System-justifying belief can also be beneficial for low-status individuals if it allows them to feel that future outcomes are within their control, regardless of their present situation (Lachman & Weaver, 1998; McCoy, Wellman, Cosley, Saslow, & Epel, 2013). The concept of “control” has been investigated in a number of ways in the psychological literature (for review, see Skinner, 1996). This section will review feelings of personal control, self-efficacy, agency, and locus of control, all of which are likely to be influenced by descriptive beliefs about the world and one’s place in it, as well as by learned experiences in the world, such as at the workplace. All of these constructs have been found to relate to well-being, in ways that will be described in the following sections.

Some researchers have found that the relationship between system justification beliefs and health outcomes is mediated largely by feelings of personal control, or the perception that individuals have the ability to influence their own outcomes (McCoy et
This finding makes sense, as McCoy et al. note, if meritocracy beliefs allow lower-status individuals to believe that they will soon be able to improve their status in the socioeconomic hierarchy. This general phenomenon is seen across a number of constructs, with those who believe that their outcomes will be fair feeling more confident in the ability to achieve their goals (Sutton & Winnard, 2007).

This finding highlights how a feeling of personal control, or a belief in one's ability to influence one's outcomes, can strongly contribute to well being. Across many domains, these feelings of personal control have been shown to be highly predictive of positive life outcomes (e.g., Ross & Sastry, 1999). Perceived control predicts psychological well-being and physical health, with higher sense of control associated with less illness, faster recovery, and even greater longevity (Lachman, 1986; Rodin, 1986). In studies of individuals with major illnesses, feelings of personal control have been linked to improved outcomes for patients who are physically worse off than those with lower feelings of control, even though the illness itself is a condition over which patients have very little control (Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, & Cruzen, 1993).

Feeling a lack of control can lead to depression and passive types of coping behaviors. Relatedly, learned helplessness refers to feeling unable to cope with stressors and therefore abandoning any attempts to actively resolve the situation, turning to passive, avoidant strategies instead (e.g., Abramson, Seligman, & Teasdale, 1978; Maier & Seligman, 1976; Peterson & Seligman, 1984). This type of helpless response can be learned over repeated experiences with low-control situations (Maier & Seligman, 1976).
and is affected by the causal attributions an individual makes for the uncontrollable outcomes (Abramson et al., 1978). Individuals who report more general external locus of control are more prone to passive, helpless behavior in response to aversive stimuli, and those who believe the aversive stimuli are due to chance (implying low controllability) also respond more passively than those who believe it is skill-related (and therefore more controllable) (Hiroto, 1974). Essentially, people give up trying to control their outcomes if they believe they do not have the efficacy to achieve their goals, or if they believe forces beyond their control render their abilities irrelevant anyway. This means that a lack of feeling in control is generally associated with a lack of motivation and subsequent poor performance (Spector, 1982). Control beliefs thus relate effort-reward beliefs to behavior.

Feelings of control can also explain some of the health disparities that have been linked with social class (Lachman & Weaver, 1998). Although those who are exceptionally wealthy have increased risk for some diseases, such as hypertension, those who are the least advantaged tend to suffer from the worst health outcomes (Banks, Marmot, Oldfield, & Smith, 2006). Lachman and Weaver found, consistent with earlier results, that income was strongly tied to beliefs in control, and that these feelings of control in turn were significant predictors of good health. This makes a great deal of sense in light of studies in non-human animals, which have linked uncontrollable stressful situations to responses similar to those in individuals who suffer from chronic anxiety and depression (e.g., Barlow, 1988). In fact, one of the primary ways to induce anxiety and depressive-like symptoms in rats is to expose them to a series of chronic, unpredictable, uncontrollable stressors over a period of time (Willner, 1997). Thus,
exposure to an unpredictable environment with low control and high stress - like the environments inhabited by many lower-income individuals - is likely to contribute to poor mental and physical health. The reward structures experienced by individuals, and their effects on feelings of control, could therefore have dramatic impacts on well-being.

**Self-Efficacy, Control, and Motivation**

The idea of personal control, or the ability to intentionally influence outcomes, also resembles the construct of self-efficacy (Bandura, 1977). Similarly, theories of personal agency describe the importance of feelings of agency, or individuals’ ability to enact their intentions (Bandura, 2001). Feelings of perceived control encompass beliefs about both self-efficacy and the controllability of the situation, but as a broader concept, perceived control can be considered a single latent variable, as shown in hierarchical analysis (Ajzen, 1991).

Motivation is regulated by the expectation that a behavior will produce certain outcomes of certain value; it is shaped by individuals’ beliefs about what they can do (efficacy) as well as beliefs about likely outcomes (perceived control) in a given situation (Ajzen & Madden, 1986; de Vries, Dijkstra, & Kuhlman, 1988; Dzewaltowski, Noble, & Shaw, 1990).

Expectations play an important role in individuals' task motivation and performance. The way in which participants are given and told about their control over the rewards for participation in experiments will affect motivation and performance (Ryan, Mims, & Koestner, 1983). Similarly, if participants expect to be rewarded well for their work, they generally work longer and do indeed tend to earn more rewards than
participants with low expectations (Abeler, Falk, Goette, & Huffman, 2011). This shows a practical sensitivity to the situation: If individuals indeed are not able to influence their outcomes in a given situation, it would be a waste of resources to expend effort on that task.

**Locus of Control**

These issues of controllability and attributions for outcomes have been studied extensively in the locus of control literature, which started to gain in prominence in the 1960’s (Rotter, 1966). This work explores how behavioral responses differ across individuals based on their locus of control, or whether individuals expect outcomes to be contingent on their behavior (internal locus of control) or unrelated to it (external locus of control) (Rotter, 1990). External locus of control is associated with the low feelings of personal control and the associated behavioral responses discussed earlier, such as passive reactions, feelings of helplessness, and depression (Benassi, Sweeney, & Dufour, 1988). Some evidence suggests that these relationships between locus of control and behavioral outcomes may even be valid across cultures – for instance, in China (Tong & Wang, 2012).

Feelings of personal control have been shown to correlate positively with socioeconomic status and other types of advantage, such as White ethnicity and IQ (Battle & Rotter, 1963). This echoes patterns seen in the locus of control literature, where social advantage is linked with more agentic responses to challenges. Less-advantaged individuals, such as minorities and lower-class people, tend to report a more external
locus of control (Joe, 1971), believing themselves to be less able to influence their outcomes.

Although these feelings of personal control and agency are often looked at as individual difference measures, some evidence suggests that situational and external factors can be a significant influence. For instance, not surprisingly, individuals tend to report a more external locus of control after experiencing a crisis (RE Smith, 1970). This suggests that people do tend to be sensitive to the reality of their surrounding environment, at least to some degree; after experiencing an impactful event over which they indeed had no control, they indeed tend to attribute a great deal of responsibility for their outcomes to uncontrollable, external factors.

Even illusions of control can be psychologically beneficial. For example, people facing major illnesses tend to fare better when they believe they have control over their outcomes, even if this is not actually the case (Taylor, 1983; for review, see Taylor, 1991). In general, these kinds of illusions - where individuals believe they have more control over their outcomes than they actually have - are associated with positive mental health (e.g., Taylor & Brown, 1994). Where we most often fail to see over-estimates of personal control is in populations of depressed individuals, who tend to be accurate in their ratings of control as opposed to over-estimating as non-depressed individuals would (Alloy & Abramson, 1979).

**Insights from Organizational Psychology**

The previous sections have established how feelings of control can relate to ideological beliefs and well-being. While the studies thus far have largely been drawn
from health and social psychology, these ideas and their implications have also been studied extensively in the organizational literature. Feelings of control have been implicated in workplace satisfaction, employee well-being, and productivity in a number of ways. Two models have been proposed to characterize these workplace environments. The first, the appropriately named Demand Control model, focuses on the relationship between demands made of employees in the workplace and the degree of control the employees experience in their positions (for review, see Griffin, Fuhrer, Stansfeld, & Marmot, 2002; Karasek, 1979). Generally, high workplace demands are associated with poor well-being, but this link is moderated by feelings of control and perceived social support (Van der Doef & Maes, 1999). Employees who have demanding jobs and limited control in their positions experience the lowest well-being. Importantly, these kinds of low-control jobs are generally associated with lower-level positions, held by those of lower socioeconomic status. Therefore, feelings of control correlate with social class, as discussed previously (e.g., Battle & Rotter, 1963).

However, this theory focuses on the structural aspects of the job and workplace environment, insufficiently considering how individuals may differentially react to these stimuli. The second related theory, the Effort-Reward Imbalance (ERI) model, looks at similar feelings at a more individual level. According to this theory, reciprocity norms of society dictate that effort at work ought to lead to positive rewards such as money, esteem, opportunities for advancement, and job security (Siegrist et al., 2004). Job satisfaction and psychological well-being are therefore based largely on whether the efforts made at work are in balance with the rewards gained. This is related to the concept
of equity theory, as described earlier, but there are also a couple of notable differences. First, it matters only for undesired outcomes; individuals who are rewarded more than they feel is fair do not tend to suffer negative effects (Siegrist et al., 2004). Also, this process has less to do with comparison to others and their rewards, and focuses more on what rewards an individual would predict based on the effort invested (Kuper, Singh-Manoux, Siegrist, & Marmot, 2002; Siegrist, 2002; van Vegchel, de Jonge, Bosma, & Schaufeli, 2005).

The effort-reward imbalance model focuses more on distributive justice and fairness, whereas the demand control model focuses more on feelings of control. However, these concepts may be closely related, if not functionally identical. For example, in the Whitehall II longitudinal study of British office workers, both models were equally strong predictors of heart disease (Bosma, Peter, Siegrist, & Marmot, 1998). Because an effort-reward imbalance is likely to lead to subjective feelings of low personal control, this overlap in the constructs makes sense. In general, effort-reward imbalances at work are associated with negative health consequences such as heart disease and high blood pressure (de Jonge, Bosma, Peter, & Siegrist, 2000; Gilbert-Ouimet, Brisson, Vézina, Milot, & Blanchette, 2012; Kudielka, Von Känel, Gander, & Fischer, 2004; Kuper et al., 2002; Marmot et al., 1991; Siegrist, 1996; Siegrist et al., 2004; van Vegchel et al., 2005). This is especially true for people who feel a high commitment to their work and a need for approval at work (Siegrist, 1996). Environments in which effort and reward are not balanced are particularly damaging to
those who are the most invested in their jobs, such that the people who care the most are the ones who suffer the most when their efforts are not rewarded.

However, it is often difficult for individuals to determine whether their outcomes are fair or imbalanced, unless they also know the outcomes earned by others. In the workplace, this is often difficult because of the social (and sometimes official) taboos placed on discussing comparative salaries. When individuals are evaluating their outcomes based primarily on their own experiences, they then generally use the fairness of the procedure - rather than comparison to others - as a heuristic for evaluating the fairness of their outcome (van den Bos, Lind, Vermunt, & Wilke, 1997). The reward structure they experience, therefore, is likely to be particularly important for influencing individuals' feelings about whether or not their outcomes are just.

**Current Trends in Mobility**

We have established that feelings of control are beneficial, so how does this translate to feelings about socioeconomic status and the possibility of social advancement? The current social structure of the United States has many people in the lower rungs of society feeling trapped and unable to advance their station in the world. As one working-class preschool teacher told a reporter at *The Atlantic*, "I'm working really hard, but I'm not getting ahead" (Tankersley, 2012). Social mobility in modern U.S. society may not be as easy as meritocracy would have us believe, particularly for those who are the most disadvantaged.

Upward social mobility, or the ability for children to attain higher social status than their parents, is becoming increasingly difficult in the United States (Andrews &
Leigh, 2009; Kopczuk et al., 2010). This may be due in large part to the fact that inheritance currently has a tremendous influence on accumulated wealth, and returns on capital are currently higher than returns on income and labor; this means that the more money one has already, the easier it is to accrue additional assets (Piketty & Goldhammer, 2014). Additionally, the wage gaps between college graduates and those without a college education have been rising since the early 1980s, leading to increased wage inequality (Goldin & Katz, 2007). Therefore, income inequality has been rapidly rising over the past several decades (Kopczuk et al., 2010).

Even in education, a system generally considered to promote equality and upward mobility, access to and success in the higher education is becoming increasingly stratified by social class (Haveman & Smeeding, 2006). Within institutions, even students who are objectively middle-class and not resource-deprived can suffer negative psychological outcomes if they feel subjectively lower status than their peers (Johnson, Richeson, & Finkel, 2011) or feel like the campus culture does not match with their own (Stephens, Townsend, Markus, & Phillips, 2012). Even the institutions themselves are becoming more stratified, as the gap between universities with the most and the least resources continues to widen (Davies & Zarifa, 2012).

Thus, even if low-SES individuals feel in control of their social status, they may not actually be able to improve their position. Furthermore, with so many barriers to upward mobility, how likely is it for lower-status individuals to endorse these beliefs at all?

Socioeconomic Status and Perceptions of Personal Control
The system-justifying views discussed in this chapter rely on the assumption that hard work is sufficient to reap rewards. As these social data show, in the context of employment and life outcomes, this is often not the case. For individuals trapped in low-wage jobs without chance of advancement, those searching for jobs that are not available, those saddled with high burdens of debt or family responsibilities, and others struggling to make ends meet, the amount of effort they exert rarely meets with a proportional reward. While it may be true that working long hours leads to great financial gain for those in some positions, such as highly-paid lawyers or investment bankers, those on lower tiers of the social ladder may put in equal hours of effort for far less reward. As a result, upper- and lower-class individuals may have divergent perceptions of the relationship between hard work and reward in society, and these views are likely to be influenced by experience in different reward structures.

Experience with environments in which hard work is not rewarded are likely to diminish feelings of personal control, and these types of experiences seem particularly likely for lower-SES individuals. Fitting with this idea, an increasing body of research suggests that lower-SES individuals tend to feel a lower sense of personal control (Kraus, Piff, & Keltner, 2009; Lachman & Weaver, 1998; Ross & Sastry, 1999). While the focus of this research is on the United States, this may be true even cross-culturally. For example, in a study of Mexico City residents, low feelings of personal control and the associated passive coping strategies were a significant mediator of the relationship between poverty and subjective well-being (Lever, Piñol, & Uralde, 2005).
While feeling unable to control one's outcomes may not be psychologically adaptive, it is likely to be an objective reflection of daily realities in which factors beyond an individual's control (such as labor policies, employment possibilities, or health care needs) impair the possibility for upward social mobility. Along these lines, past work has shown that those who are less advantaged are less likely to hold beliefs that justify the current system as fair (Zimmerman & Reyna, 2013). Similarly, Kraus et al. (2009) found that lower social class is indeed related to an increased tendency to make contextual explanations for economic inequality, but that this relationship is mediated by perceived control.

That said, when individuals do indeed have no control over their outcomes, it can sometimes be beneficial to recognize their helplessness, lest their futile attempts to exert control lead to disappointment and frustration (Wortman & Brehm, 1975). Taylor (1983) examines this research in the context of chronic illness to show that feelings and perceptions of control are important when adapting to chronic illness, but they have some realistic limits. In general, feelings of control are useful and adaptive even when individuals are faced with negative outcomes, whether those are physical or social (Thompson et al., 1993).

Because of the consequences of feelings of control for health, and the psychological and social impact of related descriptive worldview beliefs, it is important to understand what shapes these processes. Practical and ethical concerns recommend against manipulating these kinds of life experiences in significant domains such as
employment, so I turn instead to the comparatively safer world of computer games to a variation of a paradigm developed by Shah, Shafir, and colleagues.

Computer Games As a Paradigm for Experimental Research

Previous researchers have investigated the influence of life experiences on cognitive processing in a laboratory setting by using an online game paradigm, where the conditions of the game are designed to simulate relevant aspects of daily experiences. One of the most well-known paradigms uses a game of “cyberball,” in which animated characters play a ball-passing game with the participant, to simulate a social environment of inclusion or exclusion (Williams, Cheung, & Choi, 2000). In studying socioeconomic differences, Shah and colleagues have used computer games to simulate some of the aspects of scarcity that are the most psychologically relevant to the experience of living in poverty (Shah, Mullainathan, & Shafir, 2012).

This work uses the same basic tenet of this experimental approach, developing an online game to create a meaningful psychological environment for participants. Such a temporary manipulation is not expected to override a lifetime's worth of experiences; participants' subjective feelings of social class are likely to still significantly impact their perceptions and cognitions. However, if my minimal manipulations do have an impact, it is possible that actual real-world experiences would have an even more dramatic effect. Therefore, although I anticipate small effect sizes, I believe any observed differences to be theoretically meaningful.

Hypotheses
In a series of studies, I investigate some of the consequences of experiences with different reward structures. In particular, I establish that social class is a significant predictor of effort/reward beliefs, that these beliefs are associated with a number of important life outcomes, and that manipulating effort/reward beliefs can lead to similar outcomes in individuals regardless of social class.

In particular, I have three primary hypotheses:

1. Individuals of lower social class are less likely to endorse a proportional relationship between effort and rewards in society, due to more experience with environments in which effort and reward are disconnected.

2. Experience with effort/reward environments is a major influence on feelings of personal control. Individuals whose effort is more directly rewarded will therefore feel increased personal control.

3. Experience in effort/reward systems can also affect broader social views, such as perceptions of social mobility in the United States, in addition to more proximal beliefs about the system itself.

To explore these hypotheses, I first conducted two pilot studies to gather correlational data.

**Pilot Study 1**

As a preliminary investigation of these patterns, I collected correlational data from 250 Amazon Mechanical Turk participants in September, 2013. Only participants from the United States were eligible to access the survey. After eliminating respondents who failed one of two instructional manipulation checks, or who did not respond to a
free-response question, 229 responses remained. With this first study, I sought to establish whether there are, indeed, relationships between social class, effort-reward beliefs, belief in social mobility, optimism about the future, and satisfaction with life.

**Method and Measures**

Items assessing effort/reward relationships were drawn from other common scales; in particular, items from the "hard work" factor of various Protestant Work Ethic scales (for review, see Furnham, 1990) and a few relevant items from the Economic System Justification Scale (Jost & Thompson, 2000), as well as several new items written for this study. The scale included items such as, “If you work hard you will succeed,” “Most people who don't get ahead in our society should not blame the system; they have only themselves to blame,” and “The reason some people are rich is because they have worked harder than others.” The items were highly correlated, $\alpha = 0.93$. Satisfaction with life was measured by the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), $\alpha = 0.89$.

A scale of beliefs in social mobility was constructed for this study, with items adapted from Major et al. (2007) and several general polling questions used by major national research groups; $\alpha = 0.81$. Items included, “In the United States, it is possible to go “from rags to riches,” “There are a lot of opportunities for people to move up the social ladder,” and “If you are born rich, it is very unlikely you will ever be poor.”

Finally, a measure of future aspirations and optimism about the future was adapted from similar questions asked in a 2012 survey by Pew Research Center (Pew Research Center, 2012), $\alpha = 0.86$. Items included, “Even if I don't right now, in the future
I will have enough income to lead the kind of life I want,” “I don't mind working hard now because I know that it will eventually be worth it,” and “I am optimistic I will be able to achieve my future goals.”

Measures were assessed in the order described, with items presented randomly within scales.

After completing the primary measures, participants were asked their household income, educational attainment, self-selected social class category, ranking on a subjective SES ladder (Adler, Epel, Castellazzo, & Ickovics, 2000), political orientation (on a scale of liberal to conservative, on economic issues, social issues, and overall), age, gender, and ethnicity. At the end of the survey, participants were asked to freely respond to the question, "What do you think: in our current society, what is the relationship between effort and reward? Have personal experiences influenced your views?" and then were debriefed.

**Results**

As predicted, subjective social status was significantly correlated with beliefs in a direct effort-reward relationship ($r = 0.25, p < 0.001$), satisfaction with life ($r = 0.42, p < 0.001$), beliefs in social mobility ($r = 0.27, p < 0.001$), and optimism about the future ($r = 0.32, p < 0.001$). Subjective status was not correlated with political orientation ($r = 0.09, p = 0.18$), but was correlated with household income ($r = 0.43, p < 0.001$). Household income was significantly (though more weakly) correlated with life satisfaction, belief in mobility, and optimism about the future, but was not significantly correlated to effort/reward beliefs (see Table 1).
Discussion

Consistent with my hypotheses, I find that more-advantaged participants report better well-being, stronger belief that hard work leads to rewards, and higher perceptions of social mobility. Based on the previously-described work of Kraus et al. (2013) and others, it is not surprising that subjective status is more related to these societal beliefs than are more objective markers, such as income. Thus, for the remainder of this paper, I focus on subjective status as a primary individual difference moderator.

Pilot Study 2

In my next pilot, I wanted to replicate my preliminary findings, provide further evidence of scale validity, and relate these constructs to feelings of personal control and perceived constraints, as studied by Lachman and Weaver (1998) and Kraus et al. (2009).

Method

Data was collected on Mechanical Turk, as before. In addition to the previous measures, participants completed a variation of the effort/reward scale that assessed to what extent participants felt this relationship applied to them personally (as opposed to more generally in society; see Appendix for scale), a measure of self-esteem (Rosenberg, 1989), as well as measures of personal mastery / control and perceived constraints (Lachman & Weaver, 1998).

Results

All correlations showed patterns and effect sizes similar to those seen in the previous study. Additionally, universal effort/reward beliefs were highly correlated with feelings of "personal effort/reward" ($r = 0.71, p < 0.001$), personal control / mastery ($r = \ldots$)
0.57, \( p < 0.001 \), and perceived constraints (\( r = -0.37, p < 0.001 \)). All of these measures were highly and significantly correlated with all of the outcome variables, in the predicted directions.

**Discussion**

Subjective social status is clearly associated with effort/reward beliefs, and both are associated with satisfaction with life, beliefs in social mobility, and optimism about the future. These effects were not explained by political orientation. The close correlations among personal effort/reward beliefs, universal effort/reward beliefs, feelings of personal mastery or control, and perceived constraints suggest that these measures are all describing similar underlying constructs. However, due to the correlational nature of these data, the directionality of the relationship is unclear. While it seems likely that experience in social class environments would give rise to effort/reward beliefs, it could also be that these beliefs (and the behaviors they encourage) lead to social class differences. Therefore, in my next studies, I want to establish directionality by manipulating these factors, and determine the effects of these changes on feelings of personal control.

To operationalize effort, I use a task in which persistence is either increasingly rewarded through an incrementally-rising points system, or in which the points possible per question remain constant across all attempts. While the concept of "effort" can be conceptualized in many ways, I start here by emphasizing persistence because of its importance for achieving success (e.g., Duckworth, Peterson, Matthews, & Kelly, 2007).
Study 1

Methods

Participants. 440 responses from participants in the United States were collected via Amazon's Mechanical Turk (MTurk) website (Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011; Mason & Suri, 2012; Paolacci, Chandler, & Ipeirotis, 2010); participants were paid $0.50 for their participation. After screening out incomplete responses\(^2\), 410 remained. Median age was 32, median household income was $35,001-50,000, 54% of participants were female, and median educational attainment was a 2-year college degree. 84% of participants reported white or Caucasian heritage. On scales of 0 (extremely liberal) to 100 (extremely conservative), mean political orientation for social issues was 35, economic issues was 47, and overall was 40.

Materials and procedures. After providing consent, participants were asked to complete an instructional manipulation check (Oppenheimer, Meyvis, & Davidenko, 2009), in which a long paragraph thanking participants for their careful attention to detail included instructions to ignore the next question and instead type the word "attention" into the free response text box at the bottom of the page. The text box was preceded by the question, "How many studies have you completed on MTurk?" This was designed to

\(^2\) For our purposes, in this and all subsequent studies we consider “incomplete” to be any participant that stopped responding after a certain point in the study. Participants were given the option to leave questions blank if they so desired, though the software was set to remind participants of unanswered questions before they could proceed. Participants that left only select questions blank were rare, and were retained for analysis.
"catch" any participants who might be skipping over long sections of text and focusing instead on the more obvious questions. If participants followed instructions and typed the word "attention" into the box, they were thanked for reading the instructions carefully and allowed to proceed. If they typed something else into the box or left it blank, an error message would pop up and ask them to read the page more carefully and try again.

Next, participants were introduced to the game paradigm and the scoring system to which they had been assigned. Participants received a number of points for answering questions correctly, with a number of points varying by condition. Each question in the "effort-reward match" (ERM) condition was worth 0.2 points more than the previous question, so that the first question was worth 1 point, the next worth 1.2 points, and so forth. By scaling the points up in this way, I ensured that participants who worked harder by spending more time attempting the quiz questions were increasingly rewarded for increasing their effort. The more they persisted and the more questions they attempted, the greater the possible rewards, and therefore the greater their ultimate score.

In the "effort-reward imbalance" condition (ERI), all questions were worth 1 point. Participants who answered more questions were still able to earn more points, but additional perseverance did not increase the potential for reward. It is worth noting that in this condition effort still was rewarded, it was simply not rewarded as strongly as in the ERM condition. I use this label to fit my anticipated effects with the previous research from organizational psychology; following from the effort-reward imbalance literature, I expect participants who feel their effort is disproportionate to their received rewards will feel less optimistic about their futures and the world at large.
In both conditions, incorrect responses were simply worth no points, but were not penalized. I set the scoring up in this way to avoid any potential loss aversion concerns participants might have about getting points deducted for attempting questions about which they were uncertain.

After learning about the scoring system, participants were then presented with the "quiz questions," a series of multiple-choice questions in the style of the television show "Family Feud." These included bland and commonly-understandable questions such as, "What is a reason you would stop the car during a road trip?" Participants were asked to indicate which of the six answers (e.g., get gas, getting hungry, check directions, need to use the bathroom, kids are fighting, sight-seeing) would be the most popular response if the question were asked to a crowd of people. The "correct" answers (in this case, "get gas") were influenced by actual Family Feud responses but were not actually the most popular answers. Instead, the "answers" were made up by the author. This removed the possibility that participant performance could be influenced by some sort of skill at guessing crowd-sourced answers. Importantly, the questions were not presented as any form of diagnostic test or indicator of social knowledge, but were merely described as "quiz questions."

Three questions were displayed per page, and after each page, participants were shown which questions they had answered correctly, what the correct answers were, how many points they earned, how many points were possible for each question, and their cumulative score thus far. They were then given the option to continue answering questions (up to a maximum of 57 questions) or to proceed to the next part of the study.
(the dependent measures and demographics questions). Participants were told (and subsequently reminded throughout the study) that those who scored in the top 5% of all participants would be entered into a raffle for a $50 MTurk bonus payment.

**Dependent measures.** As a manipulation check, participants completed a short scale of game-specific effort-reward beliefs (e.g., "I think I could improve my score on this game if I tried a little harder"). I hoped that those in the ERI condition would express greater belief that effort in the game would lead to a higher score. Participants also completed a 7-item scale of generalized effort-reward beliefs (from the pilot studies 1 and 2), measures of personal control and perceived constraints (Lachman & Weaver, 1998), the satisfaction with life scale (Diener et al., 1985), measures of perceptions of social mobility in the United States (also from the pilot studies), measures of self-esteem (Rosenberg, 1989), and the measures of optimism about the future from the pilot studies.

**Results**

As I expected participant SES to play an important role in these processes regardless of my experimental manipulations, I ran all analyses controlling for participants' subjective SES, as measured by the (continuous) subjective SES ladder. I use subjective SES as opposed to more objective measures, such as income, because in this situation I believe that it is participants' subjective experience in these environments that shapes their psychological responses. Furthermore, I have reason to predict – based on my pilot data and previous research from other labs (e.g., Kraus, Tan, & Tannenbaum, 2013) – that subjective SES may be more related to these types of beliefs about effort and society than are more objective markers. Across all studies, the significance patterns of
the main findings were unchanged when no longer controlling for SES, though SES was significantly associated with most dependent measures, and so was retained in the analyses reported here.

All analyses were also conducted as hierarchical linear regressions to test for interactions between experimental condition and subjective SES, but since no significant interactions were found, the results from this and all following studies are reported as an analysis of covariance (controlling for subjective SES) in order to simplify presentation.

**Manipulation checks and game-specific attitudes.** An ANCOVA with participants' subjective SES entered as the covariate revealed a significant effect of reward condition on game-specific effort-reward beliefs, $F(1, 407) = 5.88, p = 0.016, \eta^2_p = 0.014$, with participants in the ERM condition (whose possible points increased with perseverance) reporting a higher correlation between effort and reward in the game ($M = 4.03, SD = 0.88$) than those in the ERI condition who could earn only one point per question ($M = 3.80, SD = 0.97$). Participants' subjective SES was not a significant covariate.

Motivation to win the $50 raffle, participants' reported enjoyment of the game, and participants' self-reported frustration with the game did not differ by condition.

**Time spent and questions attempted.** Controlling for participants' SES, an ANCOVA found a significant effect of condition on number of questions attempted, $F(1, 407) = 8.03, p = 0.005, \eta^2_p = 0.019$, but no significant effect of participant SES. Participants in the ERM condition, on average, attempted more questions ($M = 32.83, SD = 20.70$) than did those in the ERI condition ($M = 27.18, SD = 18.88$). Unsurprisingly,
therefore, experimental condition also had a significant effect on the amount of time participants spent on the study, \( F(1,407) = 7.26, p = 0.007, \eta^2_p = 0.018 \). Participants in the ERM condition spent more time (\( M = 6.80, SD = 0.55 \)) than did those in the ERI condition (\( M = 6.65, SD = 0.50 \)).

**Personal control and perceived constraints.** Once again controlling for participants' subjective SES, an ANCOVA found that participants in the ERM condition reported significantly more feelings of personal control (\( M = 4.50, SD = 0.83 \)) than did those in the ERI condition (\( M = 4.20, SD = 0.81 \)), \( F(1,407) = 10.38, p = 0.001, \eta^2_p = 0.025 \). The covariate, participants' subjective SES, was also significantly related to feelings of control, \( F(1,407) = 22.59, p < 0.001, \eta^2_p = 0.053 \). As expected, the opposite pattern was found for feelings of constraint, with participants in the ERM condition reporting marginally lower levels of perceived constraints (\( M = 2.95, SD = 0.89 \)) than those in the ERI condition (\( M = 3.15, SD = 0.89 \)), \( F(1,407) = 3.52, p = 0.061, \eta^2_p = 0.009 \), with subjective SES also significantly related to perceived constraints, \( F(1,407) = 27.17, p < 0.001, \eta^2_p = 0.063 \).

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3 Time spent on the study was log-transformed before analysis due to a positive skew in the distribution of completion times.

4 A hierarchical linear regression was also conducted to test for an interaction between participant SES and experimental condition. The overall model including the interaction term was not significant at the 0.05 level, \( F(3, 406) = 2.29, p = 0.078 \); there was no significant interaction between condition and SES (\( \beta = 0.071, p = 0.63 \)). Studies 2-4 also found no significant interaction.
Life outcomes. Again controlling for subjective SES, participants in the ERM condition reported significantly more life satisfaction \((M = 3.75, SD = 1.06)\) than those in the ERI condition \((M = 3.49, SD = 1.02)\), \(F(1,407) = 4.40, p = 0.037, \eta^2_p = 0.011\), with subjective SES a significant covariate, \(F(1,407) = 57.69, p < 0.001, \eta^2_p = 0.124\). However, experimental condition was not significantly related to optimism about the future, \(F(1,407) = 2.04, p = 0.15\), though SES was a significant covariate, \(F(1,407) = 35.42, p < 0.001, \eta^2_p = 0.080\), nor was condition related to self-esteem, \(F(1,406) = 1.02, p = 0.314\), although subjective SES was a significant covariate for self-esteem as well, \(F(1,406) = 35.28, p < 0.001, \eta^2_p = 0.080\).

Perceptions of social mobility. Participants in the ERM condition reported significantly higher perceived social mobility in the United States \((M = 3.38, SD = 0.89)\) than those in the ERI condition \((M = 3.14, SD = 0.98)\), \(F(1,407) = 5.36, p = 0.021, \eta^2_p = 0.013\), again controlling for subjective SES. Not surprisingly, subjective SES was a significant covariate, \(F(1,407) = 17.41, p < 0.001, \eta^2_p = 0.041\).\(^5\)

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\(^5\) As a rough analysis to begin exploring the role of points earned, the point totals were Z-scored within condition and included as a control in a linear regression. This is statistically questionable, as experimental condition was highly correlated with number of points earned due to the differing reward structures, but still useful as a preliminary exploration. The overall model was still significant, \(F(3, 406) = 8.40, p < 0.001\), model \(R^2 = 0.051\), and condition remained a significant predictor \((\beta = -0.11, p = 0.021)\) as did participant SES \((\beta = 0.20, p < 0.001)\). Points scored was not a significant predictor \((\beta = \ldots\).
Discussion

The points manipulation used in this game paradigm did indeed appear to have the intended effect, with participants in the ERM condition reporting a more direct effort-reward relationship in the game than those in the ERI condition. This is noteworthy because effort and reward (as operationalized by persistence and points earned) were certainly related in both conditions, just more closely related in the ERM condition. Although participants' socioeconomic backgrounds continued to have an important impact on almost all measures of interest, experiences with the reward structures in the trivia game still influenced participants' feelings of personal control and perceived constraints, as well as more generalized attitudinal outcomes, such as optimism about the future and perceptions of social mobility. This provides some empirical evidence for a potentially powerful force underlying descriptive beliefs about society - if individuals are in an environment in which they feel their effort is rewarded (or not), they may generalize these beliefs to the experiences of others and form their beliefs about the current state of society accordingly.

Building on the correlational findings of Pilot 1, Pilot 2, and previous researchers (e.g., Starks, 2003), this study suggests that experience in reward environments can affect individuals’ perceptions of social mobility independent of their social class backgrounds. By showing this in an experimental context, I illustrate the power of these situational

0.04, \( p = 0.405 \)). However, to test the possible effects of points earned more thoroughly, the experimental design of subsequent studies controls for points earned.
factors to influence judgments regardless of individuals' social class backgrounds and any inherent qualities that may have influenced their social positions.

**Study 2**

While Study 1 provided some initial causal evidence, the observed results could also be due to the discrepancy in the mere number of points being awarded. While participants were not made aware of the other condition's reward structure, it could be that simply being awarded a higher number of points had a significant psychological impact beyond (or instead of) that of the scaling vs. constant reward structure. To test this, I adapted the constant-points condition in Study 2 to reflect the average points earned in the ERM condition of Study 1, so that in Study 2, each question in the constant-points ERI condition was worth 4.87 points. Additionally, I added a new condition, "effort-reward random" (ERR), in which potential points per question were randomized. This allowed us to investigate if it might be the changing values in the ERI condition, rather than the increasing manner in which they changed, that were driving results in Study 1. If it is the change itself, rather than the way the points change, the constant ERI and the randomized ERR conditions should have similar effects.

Additionally, some recent work suggests that rewards of uncertain magnitudes -- such as those awarded in the randomized ERR condition -- may actually increase motivation to obtain those rewards (Shen, Fishbach, & Hsee, 2015). With this in mind, it is possible that those in the ERR condition may be more motivated to persist on the quiz questions task than those in either the point-scaling (but predictable) ERM condition or the constant-points ERI condition.
Methods

Participants. 474 responses from participants in the United States were collected via MTurk, with previous participants kept from participating via a specialized Qualtrics script (Peer, Paolacci, Chandler, & Mueller, 2012). Participants were again paid $0.50 for participation. After screening out incomplete responses and participants who noted that they had previously participated in a similar study, 436 responses remained. Median age was 31, median household income again $35,001-50,000, and median educational attainment was again a 2-year college degree. 58% of participants were female, and 80% reported white or Caucasian heritage. Mean political orientation for social issues was 35.8, economic issues was 47.3, and overall was 41.6.

Materials and procedures. The basic procedure was the same as Study 1, with a few key exceptions. In the constant-point ERI condition, all questions were worth 4.87 points instead of 1 point, in order to make the average number of points earned per question similar across conditions. A new random condition (ERR) was also added, in which each question was worth either 1, 2, 3, 4, 7, or 12 points. These values were chosen based on the minimum and maximum points earned in the ERM condition of Study 1. Due to programming constraints, in this version of the study, participants saw one trivia question per display page, but were still given the point summary and option to move forward after every three questions. Dependent measures were the same as in Study 1, with the exception of the generalized effort-reward beliefs scale, which was not given in this study due to technical difficulties.

Results
Manipulation checks and game-specific attitudes. Unlike in Study 1, no significant effect of reward condition was found on game-specific effort-reward beliefs, as measured by an ANCOVA with participants' subjective SES as the covariate, $F(2,432) = 0.38, p = 0.67$. Participant SES was also not significantly related. Neither condition nor subjective SES were significantly related to participants' motivation to win the raffle, reported enjoyment of the game, or frustration with the game. This suggests that, contrary to what one might expect based on Shen et al. (2015), the unpredictability of the ERR was not, in fact, more motivating for participants.

Questions attempted and time spent. An ANCOVA controlling for SES found only a marginal effect of condition on number of questions attempted, $F(2,432) = 2.49, p = 0.084, \eta^2_p = 0.011$, with pairwise comparisons showing a marginal difference ($p = 0.088$) between the point-scaling ERM condition ($M = 24.29, SD = 18.69$) and the random ERR condition ($M = 19.78, SD = 17.07$). Neither was significantly different from the constant-point ERI condition ($M = 21.24, SD = 17.55$). Participant SES was not significantly related to questions attempted. An ANCOVA found no significant effect of condition on time spent on the study, $F(1,432) = 0.43, p = 0.65$. The covariate of SES was also not significantly related to time spent.

Personal control and perceived constraints. Controlling for subjective SES, an ANCOVA found no significant relationship between reward condition and feelings of personal control, $F(2, 432) = 0.55, p = 0.58$, though like in Study 1, participant SES was a significant covariate, $F(1,432) = 27.92, p < 0.001, \eta^2_p = 0.061$. A similar pattern was
found for perceived constraints, with no significant effect of condition, $F(2,432) = 1.20$, $p = 0.302$, SES a significant covariate, $F(1,432) = 50.20$, $p < 0.001$, $\eta^2_p = 0.104$.

**Life outcomes.** I analyzed life outcomes with an ANCOVA controlling for subjective SES, as before. As with the control and constraint questions, participant SES was significantly related to life outcome measures although experimental condition was not. No effect of condition was observed on participants' satisfaction with life, $F(2,432) = 0.944$, $p = 0.39$, though SES was a significant covariate, $F(1,432) = 59.35$, $p < 0.001$, $\eta^2_p = 0.121$. There was also no effect of condition on self-esteem, $F(2, 432) = 0.41$, $p = 0.66$, though SES was a significant covariate, $F(1,432) = 43.01$, $p < 0.001$, $\eta^2_p = 0.091$. Likewise, there was no effect of condition on optimism about the future, $F(2,432) = 1.07$, $p = 0.34$, though SES was again a significant covariate, $F(1,432) = 53.44$, $p < 0.001$, $\eta^2_p = 0.110$.

**Perceptions of social mobility.** In contrast to Study 1, experimental condition had no significant effect on participants' perceptions of social mobility, $F(2,431) = 0.89$, $p = 0.41$, $\eta^2_p = 0.004$, though the covariate of participant SES was again strongly related, $F(1,431) = 38.45$, $p < 0.001$, $\eta^2_p = 0.082$ (see Figure 2).

**Discussion**

In contrast to Study 1, participants in Study 2 were not significantly influenced by the manipulations of point rewards. Participants in the ERM (increasing points) condition were not more likely to feel that effort in the game would lead to rewards than were participants in the ERI (constant points) or ERR (random points) conditions. It is not surprising, therefore, that condition had no observable effects on the other measures of
interest, most particularly feelings of personal control, perceived constraints, and perceptions of social mobility in the United States.

A number of reasons could explain why Study 2 did not replicate the results of Study 1. As there was no observed significant difference in the time spent on the study across conditions, participants in this study appeared to be less influenced by the manipulations themselves than were the participants in Study 1. Because I anticipated very small effects from my manipulations, failure to detect an effect in Study 2 could also simply be a result of a Type II error. However, the differences could also have been due to the different visual experience of the study, because Study 2 was programmed differently to allow for true randomization of the reward values.

**Study 3**

For Study 3, I sought an additional attempt at replication, moving back toward the design of Study 1 by displaying three questions per page. To keep the visual aspects the same, for this study the software restraints necessitated randomizing points across questions rather than having a true randomization (in which values were randomly assigned for each question, with different values for different participants). Additionally, I wanted to eliminate any potential confusion or distraction posed by the 4.87 points per question awarded in the ERI condition. Therefore, in Study 3, the ERI questions were worth 4.5 questions each, a number that seemed more intuitive while still staying close to the average points per question.
Methods

Participants. 873 responses from United States participants were collected through MTurk. Past participants were again prevented from accessing the survey, and eligible participants were compensated with $0.50 and a chance to be entered in the raffle. After removing participants who had not completed the survey or who reported previously participating in a similar study, 777 participants remained. Median age was 30, median household income was $25,001-50,000, and median educational attainment was a 2-year college degree. 80% of participants reported white or Caucasian heritage, and 49% identified as female. Median political orientation for social issues was 30, for economic issues 50, and overall 40.

Materials and procedures. After again being screened for previous participation and passing an instructional manipulation check, participants were introduced to the game paradigm and their assigned scoring system. The ERM condition was the same as before, with each subsequent question worth 0.2 points more than the last. In the ERI condition, each question was worth a constant 4.5 points, as mentioned. In the randomized (ERR) condition, the same values as before were randomized via Excel and two separate orders of values were created. Half of the ERR participants saw one order, while the other half saw the other order. For analysis, these two ERR conditions were grouped together.

The interface of this task was designed to more closely mirror that of Study 1. Questions were once again displayed three per page, with screens after every page
displaying the participant's score and an option to proceed with more questions (up to 57) or skip to the next part of the study. Dependent measures were the same as in Study 1.

**Manipulation checks and game-specific attitudes.** Unlike Study 2, a small but significant effect of reward condition was found on game-specific effort-reward beliefs, as measured by an ANCOVA with participants' subjective SES as the covariate, $F(2, 773) = 3.05, p = 0.048, \eta^2_p = 0.008$; pairwise comparisons showed no significant difference between the ERM ($M = 3.90, SD = 0.89$) and ERI ($M = 4.02, SD = 0.88$) conditions, but participants in the ERI condition did endorse game-specific effort-reward beliefs more than participants in the ERR condition ($M = 3.84, SD = 0.88$). The covariate, participant SES, was also significantly related, $F(1, 773) = 5.12, p = 0.024, \eta^2_p = 0.007$. Neither participant SES nor reward condition were significantly related to participants' reported enjoyment of the game or motivation to win the raffle, but both were marginally related to reported frustration; condition, $F(2, 773) = 2.67, p = 0.073, \eta^2_p = 0.007$, had a slightly larger effect than SES, $F(1, 773) = 3.01, p = 0.083, \eta^2_p = 0.004$.

**Questions attempted and time spent.** In contrast to Study 2, but like Study 1, there was a significant effect of condition on the number of questions participants attempted, $F(2, 773) = 3.97, \eta^2_p = 0.010$. Those in the points-scaling ERM condition ($M = 6.60, SD = 0.55$) attempted significantly more questions than those the constant-point ERI condition ($M = 6.59, SD = 0.53; p = 0.053$) but a similar number of questions as those in the random ERR condition ($M = 6.60, SD = 0.55$).

Similar to the patterns of questions attempted, an ANCOVA showed a significant effect of condition on (log-transformed) time participants spent on the study, $F(2, 773) =$
8.90, $p < 0.001$, $\eta^2_p = 0.023$ (the covariate of SES was not significant). Pairwise comparisons show that, consistent with Study 1, participants in the ERM condition spent significantly more time ($M = 6.80$, $SD = 0.56$) than those in the ERI condition ($M = 6.61$, $SD = 0.54$). Participants in the ERR condition ($M = 6.72$, $SD = 0.55$) did not significantly differ from those in the ERM condition, but spent significantly more time than those in the ERI condition.

These findings do hint at a pattern consistent with Shen et al. (2015), with the unpredictable, random points perhaps encouraging participants to persist on the task (despite not reporting increased motivation to win the raffle).

**Personal control and perceived constraints.** Like Study 2, reward condition was not significantly related to feelings of personal control, $F(2, 773) = 0.85$, $p = 0.426$, or perceived constraints, $F(2, 773) = 0.58$, $p = 0.56$, as tested by an ANCOVA. Both were significantly related to the covariate of participant SES, with constraints, $F(1, 773) = 60.43$, $p < 0.001$, $\eta^2_p = 0.073$, impacted by SES similarly to control, $F(1, 773) = 62.00$, $p < 0.001$, $\eta^2_p = 0.074$.

**Generalized effort-reward beliefs.** As with feelings of personal control and perceived constraints, an ANCOVA found no significant effect of condition on general effort-reward beliefs, $F(2, 773) = 0.36$, $p = 0.70$, but such beliefs were significantly related to the covariate of participant SES, $F(1, 773) = 26.88$, $p < 0.001$, $\eta^2_p = 0.034$.

**Life outcomes.** As with general effort-reward beliefs, reward condition had no significant effect on my measures of life outcomes, though the covariate of SES was significant for all dependent measures. Condition had no effect on participants'
satisfaction with life, $F(2,773) = 0.41, p = 0.67$, though SES was a significant covariate, $F(1,773) = 108.36, p < 0.001, \eta^2_p = 0.123$. The same was true for self-esteem, $F(2, 772) = 0.49, p = 0.61$, with SES again a significant covariate, $F(1,772) = 52.08, p < 0.001, \eta^2_p = 0.063$, as with optimism about the future, $F(2,773) = 1.74, p = 0.18$, with SES again a significant covariate, $F(1,773) = 115.34, p < 0.001, \eta^2_p = 0.130$.

**Perceptions of social mobility.** Reward condition had a marginally significant effect on perceptions of social mobility, $F(2,773) = 2.43, p = 0.088, \eta^2_p = 0.006$, in the same direction as Study 1, with pairwise comparisons showing participants in the points-scaling ERM condition reporting higher perceptions of social mobility ($M = 3.36, SD = 0.93$) than those in the fixed-points ERI ($M = 3.20, SD = 0.92, p = 0.058$) or random-points ERR ($M = 3.22, SD = 0.99, p = 0.086$) conditions (see Figure 3). The ERI and ERR conditions did not significantly differ from each other ($p = 0.861$). Participant SES was again a significant covariate, $F(1,773) = 25.12, p < 0.001, \eta^2_p = 0.031$.

**Discussion**

Although the manipulations in the study once again failed to affect participants’ effort-reward beliefs or feelings of personal control / constraints, I do see some hint of Study 1 in participants’ perceptions of social mobility in the United States. Although the results were not significant at the 0.05 level, participants whose perseverance was rewarded in the points-scaling ERM condition did, on average, report higher belief in social mobility than those in the fixed-points or random-points conditions, even when controlling for participant SES. This suggests that though the effects are predictably weak, the reward structures experienced even in such a temporary situation may
influence participants’ descriptive beliefs about society even beyond the effects of their SES backgrounds. As expected, participants' SES plays a stronger role, as I would not expect a few-minute online manipulation to overshadow a lifetime of accumulated class experiences in shaping perceptions. However, that these beliefs are malleable in this way at all - and potentially even in the absence of changes in feelings of personal control - could have a significant impact on the way one considers policy decisions and public opinion about inequality. However, the results from Study 3 were far from conclusive, and I wanted to further explore the replicability of the results from Study 1. Therefore, in my next study, I return to the exact paradigm of Study 1, simply adding additional dependent measures to the end of the survey package. Additionally, I wanted to explore an additional hypothesis - perhaps the way in which rewards are given only matters when participants' end rewards (in this case, points) are small. In other words, participants are only sensitive to the reinforcement schedule when they are receiving minimal rewards. When the rewards are plentiful, it may not matter whether they scale with effort or not. To test this, in Study 4, I eliminate the random points condition and instead vary only the number of points given in the constant reward condition.

**Study 4**

**Methods**

**Participants.** 725 responses from participants in the United States were collected via MTurk, with past participants kept from participating, as before. After screening out incomplete responses or participants who self-reported participating in a previous version of this paradigm, 641 responses remained. Median age was 31, median household income
$35,001-50,000, 50% of participants were female, and 82% reported white or Caucasian heritage. Median political orientation for social issues was 30, for economic issues 50, and overall 42.

**Materials and procedures.** After completing an instructional manipulation check, as before, participants were introduced to the game and their assigned scoring system. Participants in the increasing-points ERM condition were presented with the same points scaling as before, with each question worth 0.2 points more than the previous. Other participants were assigned to one of two constant-points ERI conditions, where each question was worth either a constant 1 point (ERI-1) or 5 points (ERI-5). The visual interface was exactly that of Study 1, with three questions per page followed by scoring, displayed points, and the option to continue to skip to the next section. Dependent measures were the same as in Study 1, with a few additional questions added to the end of the survey.

**Results**

**Manipulation checks and game-specific attitudes.** A marginal effect of reward condition was found on game-specific effort-reward beliefs, as measured by an ANCOVA controlling for participants' subjective SES, $F(2,637) = 2.61$, $p = 0.075$, $\eta^2_p = 0.008$, with pairwise comparisons showing participants in the points-scaling ERM condition reporting significantly higher belief that effort leads to rewards in the game ($M = 4.06, SD = 0.84$) than those in the ERI-5 condition ($M = 3.86, SD = 0.90$). In contrast to Study 1, the ERI-1 condition, in which participants received a constant 1 point for each question, did not significantly differ from the other two conditions at the 0.05 level ($M =$
3.93, $SD = 0.89$). As before, the covariate of participants' subjective SES was not significantly related, $F(2,637) = 0.61, p = 0.44$.

There were no significant effects of participant SES or reward condition on participants' frustration with the game, though unlike in previous studies, there were significant effects of condition, $F(2,637) = 3.11, p = 0.045, \eta^2_p = 0.010$, on participants' rated enjoyment of the game, and SES was a significant covariate, $F(1,637) = 4.55, p = 0.033, \eta^2_p = 0.007$. Pairwise comparisons showed that participants in the ERM condition reported significantly more enjoyment ($M = 4.75, SD = 1.13$) than those in the ERI-1 condition ($M = 4.48, SD = 1.13$), but the ERI-5 condition ($M = 4.65, SD = 1.13$) did not differ from the others at the 0.05 level. This does suggest that the absolute number of points does not have a strong impact on enjoyment of the game.

Two new questions were added for this study -- the extent to which participants felt the points were awarded fairly, and the degree to which they felt the study captured their attention. There was no significant effect of condition on either measure, though the covariate of participants’ subjective SES was related to participants' self-reported attention, $F(1,637) = 4.27, p = 0.039, \eta^2_p = 0.007$. The effect, however, was small.

**Personal control and perceived constraints.** A series of ANCOVAs were conducted to test for the effects of reward condition, controlling for participants’ subjective SES ranking. Like Study 3, reward condition was not significantly related to feelings of personal control, $F(2,637) = 1.04, p = 0.353, \eta^2_p = 0.003$, though participant SES was a significant covariate, $F(1,637) = 52.68, p < 0.001, \eta^2_p = 0.076$. Similarly,
perceived constraints were not affected by condition, $F(2, 637) = 0.49, p = 0.61, \eta^2_p = 0.002$, though SES was a significant covariate, $F(1, 637) = 44.03, p < 0.001, \eta^2_p = 0.065$.

**General effort-reward beliefs.** An ANCOVA found no significant effect of condition on general effort-reward beliefs, $F(2, 637) = 1.65, p = 0.19$, but these beliefs were significantly related to the covariate, participants’ subjective SES: $F(1, 637) = 41.38, p < 0.001$.

**Life outcomes.** As with the previous study, reward condition had no significant effect on my measures of life outcomes, though participant SES was a significant covariate. Experimental condition did not affect participants' satisfaction with life, $F(2, 637) = 0.13, p = 0.88, \eta^2_p < 0.001$, though SES was a significant covariate, $F(1, 637) = 136.26, p < 0.001, \eta^2_p = 0.176$. Condition also did not affect participants’ self-esteem, $F(2, 637) = 0.14, p = 0.87, \eta^2_p < 0.001$, though SES was a significant covariate, $F(1, 637) = 66.56, \eta^2_p < 0.001, \eta^2_p = 0.095$. Likewise, condition did not significantly affect optimism about the future, $F(2, 637) = 2.02, p = 0.13, \eta^2_p = 0.006$, but SES was a significant covariate, $F(1, 637) = 84.94, p < 0.001, \eta^2_p = 0.118$.

**Perceptions of social mobility.** As measured by an ANCOVA, reward condition had no significant effect on participants' perceptions of social mobility, $F(2, 637) = 0.41, p = 0.67, \eta^2_p = 0.001$, though these perceptions were again significantly related to the covariate SES, $F(1, 637) = 44.96, p < 0.001, \eta^2_p = 0.066$. Participants in the ERM ($M = 3.22, SD = 0.97$), ERI-1 ($M = 3.22, SD = 0.96$), and ERI-5 ($M = 3.15, SD = 0.98$) conditions all reported similar perceptions of social mobility (see Figure 4).
Discussion

Although the reward manipulation in Study 4 had a slightly stronger effect on participants' game-specific effort-reward beliefs than it did in Study 2, I still do not see the significant effects found in Studies 1 or 2, and the effect was still quite weak. This suggests that my reward manipulation was still failing to have a strong impact on participants' subjective experience with the game. With that in mind, it is unsurprising that I also failed to replicate Study 1's effects of condition on feelings of personal control, perceived constraints, generalized effort-reward beliefs, and perceptions of social mobility.

General Discussion

Two pilot studies established that subjective social status was significantly correlated with beliefs in the effort-reward link and with perceptions of social mobility. In four experimental studies, I investigated the causal directions of these relationships.

In Study 1 participants answered questions in a Family Feud-style game. I examined how participants' beliefs regarding control, perceived constraints, and an effort-reward relationship were manipulated by altering the reward structure in the game. Participants whose increased perseverance in the game was rewarded with the possibility of earning an increasing number of points felt more feelings of personal control, fewer perceived constraints, a closer link between effort and reward both in the game and in society in general, and perceived greater current social mobility in the United States. Importantly, these effects are independent of (and not interacting with) socioeconomic status.
In Study 2 I replicated Study 1 and added an extra condition to test whether participants were affected by having access to significantly more points in the increasing points condition. This study did not yield significant results. In the third study I sought to achieve what I was hoping to demonstrate with Study 2. My procedure was similar to Study 2, but with slight cosmetic and rules changes to be more similar to Study 1 and reduce several potential sources of confusion. As in Study 2, this study was unsuccessful in replicating the effects found in Study 1.

In Study 4 I again attempted to replicate the results found in Study 1 and again simplified the game for participants. As in Studies 2 and 3 I did not find a significant impact on the effort-reward belief or feelings of control. The failures of Studies 2-4 to find significant results seem to stem from two factors. First, these manipulations have predictably small effects, which are likely to be difficult to detect even under the best of circumstances. Secondly, the reward manipulation was not significant enough to have a reliably strong impact on participants’ subjective interpretation of the game, as seen by the lack of observed differences in game-specific effort-reward beliefs.

Taken together, these studies suggest that temporary experience to differing reward structures may indeed influence some broader personal and societal beliefs, but more impactful experiences may be necessary in order to do so reliably. While disappointing, this finding is not necessarily surprising -- in Study 4, for example, the
median time spent across conditions was only 824 seconds, or just under 14 minutes. Since completing the dependent measures required a large portion of that time, participants spent very little time actually playing the game - effects might have been larger if participants had needed to complete more questions before moving on to the next part of the study. There is particular reason to suspect that a more intensive manipulation might be more likely to trigger the types of justice concerns and psychological reactions that would be found in a more ecologically-valid setting; if participants are placed in a powerful situation that encourages them to respond more reflectively than heuristically, they are more likely to consider self-presentation goals and general social norms (Lerner, 2003).

Additionally, this particular task may be an especially strict test of this phenomenon, as perseverance and effort lead to increased points in all conditions, so the manipulation was simply a matter of the degree to which that is true. Furthermore, the "correct" answers are not chosen systematically, so in all conditions there is also a large amount of chance that contributes to the points outcome. Thus, participants in all conditions simultaneously experienced some degree of effort-reward disconnect while also being rewarded at least to some degree for their perseverance. Perhaps even more disconcerting, the ultimate incentive for scoring well in the game was a raffle, an

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While participants in the ERM condition did spend more time ($M = 989.57, SD = 619.16$) than those in the ERI-1 ($M = 946.11, SD = 672.55$) or ERI-5 ($M = 989.57, SD = 484.30$), these differences were not significant.
outcome inherently governed by chance. This could have further disconnected my experimental manipulations from what participants subjectively experienced.

That I therefore see results in the predicted directions - even if not significant at the 0.05 level - suggests that my imperfect methods may nonetheless be tapping into a powerful psychological phenomenon. Future studies using more immersive methods, different types of tasks, and rewards that completely disentangle the randomness from the effort-reward relationship are likely to provide a more complete understanding of the forces at play.

It is also important to note that while I tested for interactions of my manipulations with participant SES, the characteristics of my subject population may make effects difficult to detect. While MTurk provides a population that is close to nationally-representative on socioeconomic variables (e.g., Pew, 2012), it tends to be largely younger individuals (median age around 30-31) and I see very few high income earners (annual household income >$200,000). Because the SES of my participants resembles a normal distribution, I do not have many participants at the income extremes. This could obscure an interaction that would be measurable with more participants but is not significant in these samples.

There are reasons to believe that SES may affect participants’ sensitivity to manipulations such as this, even if such effects are not observable in the current data. For example, one study found that low-SES participants were more sensitive to a just world manipulation than were high-SES participants (Bègue & Fumey, 2000). This does suggest that any interaction I might find would be more evident in lower-SES participants.
(of whom I have a number) than the higher-SES participants who are more lacking in my samples, which lends some credibility to this lack of observed effects. However, even if I were to find an interaction driven by differences in high-SES individuals, it may have limited external validity due to the similarity of my sample to the population of the United States, where very few people are on the upper end of the SES spectrum.

**Future Directions**

If supported by future research, this phenomenon could prove a counterpoint to some previous research that suggests that perceived stability of one's position leads to rationalizations and belief that the position is normative (Laurin, Kille, & Eibach, 2013). In the domain of socioeconomic status, perceived stability of one’s status (or more precisely, perceived lack of opportunity to advance one’s status) may actually decrease views that legitimize the current social system, reflected in measures such as decreased endorsement of the idea that effort leads to reward and lower perceptions of current social mobility.

In an ideal world, the next version of this study should include a direct task reward to “real” reward conversion factor, such as one point being redeemable for one dollar, as opposed to the current raffle-entry incentives offered in these studies. By incentivizing with a lottery, I add an additional element of chance to the reward structure, thereby weakening the impact of my experimental manipulations, some of which were meant to be consistent and predictable.

Along those lines, changing the primary task to one in which “correct” results are less arbitrary (or at least appear to be less arbitrary) would be more likely to yield
significant results. In the current paradigm, participants’ rewards are essentially random, because they are selecting among six possible options with no clear “right” answer. A similar task that might reward effort more directly could be a word-listing prompt, where participants get points for every entry they make that could be an answer to the provided questions. This would open more room for participants to exert effort, and would minimize the randomness of the scoring, thereby highlighting the reward structure itself.

More robust results may also be found when participants are exposed to a more immersive simulated environment, such as could be created in the laboratory. For example, if participants had to complete tasks in a foreign environment (such as a psychology department), as opposed to in the comfort of their own homes (such as on MTurk), the effort-requiring tasks might feel more effortful, amplifying the effects. It would also be interesting to see whether similar effects would be found across different types of effort, for example mental versus physical exertion. I suspect it is the nature of the rewards, rather than the nature of the tasks, that would influence descriptive beliefs about the world. However, this may also be affected by participants’ lay theories about the malleability of skill in different domains (whether outcomes are more due to skill or to chance, as in Ryan et al., 1983), so it would be important to investigate a number of different domains before drawing conclusions.

Despite these limitations, this line of work could provide insight into the forces that shape societal views, social judgments, and well-being. Understanding these processes is important because descriptive beliefs about the current state of society can shape policy attitudes and attributions for others’ positions (Hashimoto, Shiraiwa, &
Karasawa, 2012). If even a brief exposure to different effort-reward structures can at least temporarily shape broader social views, longer-term exposure over a period of years in the workforce is likely to have a dramatic effect.
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Table 1

Correlations Among Effort-Reward and Demographic Variables, Pilot Study 1

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**: Correlation is significant at the 0.01 level; *: Correlation is significant at the 0.05 level (2-tailed).
Figure 1. Effects of game reward manipulation on perceptions of social mobility in the United States (Study 1).
Figure 2. Effects of game reward manipulation on perceptions of social mobility in the United States (Study 2).
Figure 3. Effects of game reward manipulation on perceptions of social mobility in the United States (Study 3).
Figure 4. Effects of game reward manipulation on perceptions of social mobility in the United States (Study 4).
Appendix

Effort-reward relationship scale ("universal" effort/reward):

From economic system justification scale:

If people work hard, they almost always get what they want.

Most people who don't get ahead in our society should not blame the system; they have only themselves to blame.

From Protestant Work Ethic scales:

Most people who do not succeed in life are just plain lazy.

Any person who is able and willing to work hard has a good chance of succeeding.

People who fail at a job have usually not tried hard enough.

Hard work offers little guarantee of success.

If one works hard enough he or she is likely to make a good life for him/herself.

By working hard a person can overcome every obstacle that life presents.

Nothing is impossible if you work hard enough.

If you work hard you will succeed.

By working hard an individual can overcome most obstacles that life presents and make his or her way in the world.

New items:

Sometimes you can never get ahead, no matter how hard you work.

It takes more than just hard work to succeed.

The reason some people are rich is because they have worked harder than others.

Hard work is all that’s required to improve your lot in life.
Coming from a wealthy family is important for getting ahead.

"Personal" effort/reward scale:

If I work hard, I almost always get what I want.

When I don't get ahead in our society I can’t blame the system; I have only myself to blame.

When I don’t succeed in life it’s because I’m just plain being lazy.

If I am able and willing to work hard, I have a good chance of succeeding.

When I fail I have usually just not tried hard enough.

Hard work offers me little guarantee of success.

If I work hard enough, I am likely to make a good life for myself.

By working hard I can overcome every obstacle that life presents.

Nothing is impossible if I work hard enough.

Sometimes I can never get ahead, no matter how hard I work.

Hard work is all that’s required for me to improve my lot in life.

Satisfaction with life scale:

In most ways my life is close to my ideal.

The conditions of my life are excellent.

I am satisfied with my life.

So far I have gotten the important things I want in life.

If I could live my life over, I would change almost nothing.
Beliefs in social mobility scale:

There is a lot of social mobility - it is not too difficult for people to change their position in life.

There are a lot of opportunities for people to move up the social ladder.

In the United States, it is possible to go “from rags to riches.”

Most people end up staying in the same social class for their entire lives. (RC)

If you are born rich, it is very unlikely you will ever be poor. (RC)

If you are born poor, it is very unlikely you will ever be rich. (RC)

Optimism about the future scale:

Even if I don't right now, in the future I will have enough income to lead the kind of life I want. (1)

I am optimistic I will be able to achieve my future goals. (2)

I worry that I will face many difficulties that will prevent me from achieving my future goals. (3RC)

I feel confident that if I worked hard enough I could improve my position in society. (4)

I feel like I am stuck in my current position and will never be able to get ahead. (5RC)

I worry that even if I work hard, my social position in the future will be worse than it is now. (6RC)

I am more concerned with not falling behind in life than I am about getting ahead. (7RC)

I don't mind working hard now because I know that it will eventually be worth it. (8)
**Personal mastery**

I can do just about anything I really set my mind to.

When I really want to do something, I usually find a way to succeed at it.

Whether or not I am able to get what I want is in my own hands.

What happens to me in the future mostly depends on me.

**Perceived constraints**

Other people determine most of what I can and cannot do.

There is little I can do to change many of the important things in my life.

I often feel helpless in dealing with the problems of my life.

What happens in my life is often beyond my control.

There are many things that interfere with what I want to do.

I have little control over the things that happen to me.

There is really no way I can solve all the problems I have.

I sometimes feel I am being pushed around in my life.

**Rosenberg self-esteem scale**

On the whole, I am satisfied with myself.

At times, I think I am no good at all.

I feel that I have a number of good qualities.

I am able to do things as well as most other people.
I feel I do not have much to be proud of.

I certainly feel useless at times.

I feel that I’m a person of worth, at least on an equal plane with others.

I wish I could have more respect for myself.

All in all, I am inclined to feel that I am a failure.

I take a positive attitude toward myself.