‘The Prince and the Pauper’: The effect of inherited-wealth status on productivity in the lab

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'The Prince and the Pauper': The effect of inherited-wealth status on productivity in the lab*

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Abstract

There is limited theory and empirical evidence about the effects of inherited wealth and social comparison on individual labour-market behavior. Investigating the impact of inherited-wealth status – an accident of birth rather than an outcome of competition – contributes to the understanding of the mechanisms underlying intergenerational inequality. This lab experiment analyses whether framed inherited endowments influence real-effort task performance. In particular, the analysis concerns the interaction between a framed inherited status in the lab and participants' real intergenerational wealth status outside the lab. The results indicate that inheritance-framed endowments trigger a race gap (in favor of non-black participants) but identity-neutral lottery-framed endowments do not. Inheritance framing in the lab appears to trigger significant changes in behavior for *Princes* (participants that expect to inherit wealth from their parents) while opposite but non-significant effects are found for *Paupers* (who do not expect to inherit wealth from their parents).

Keywords: *experiment; slider task; inheritance; status; framing*

1 Introduction

Intergenerational wealth inherited from parents is randomly assigned by birth, not determined by competition. Individuals may then choose to accumulate earnings through effort exerted in the labour market. The motivating question then becomes how does this initial relative status impact behaviour in the labour market? This paper designs a real-effort task lab experiment in response to the gap in the literature addressing the behavioural effects of inherited-wealth

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status. In particular, it concerns the interaction between a framed inherited status in the lab and real intergenerational wealth status outside the lab.

South Africa is one of the most unequal countries in the world - a concern familiar to academics, the National Treasury and politicians, among other interest groups (Piketty, 2013; Clarke and Bassett, 2016; Donaldson, 2014). This precarious inequality has a material impact on stability in the economy, not to mention psychological and physical harm – as vividly illustrated by the Marikana massacre in 2012 (Piketty, 2013). The South African National Treasury has stated that inequality hinders growth, and in politics the Economic Freedom Fighters party established in 2013 calls for more radical redistribution of land and wealth (Clarke and Bassett, 2016; Donaldson, 2014). Since the first democratic election in 1994, poverty has decreased (due in large part to social grants) yet inequality has widened, implying incomes at the top of the distribution have increasingly grown faster (Wittenberg, 2014).[1]

There are many factors embodied in the advantage or disadvantage transmitted from parent to child. Numerous studies have sought to isolate specific attributes of intergenerational transmission and predict the extent of their impact on economic outcomes.[2] The difficulties of isolating and measuring these specific factors are fraught. Some of this research is captured in the so-called 'nature versus nurture' debate (e.g. Björklund, Lindahl and Plug, 2006). Innate or learned ability aside, it is arguably important to examine how these accidents of birth may induce individuals to exert high or low effort in the labour market. Since better-off individuals frequently have access to inherited wealth and status from the previous generation, examining how this affects behaviour in society over time contributes to the understanding of social mobility.

Section 2 reviews the literature from behavioural and experimental economics and psychology as a foundation for the experiment design. The experiment draws on the 'frame dependent self' model of social identity. This approach takes into account how the mind is thought to process information using "mental models" (Tversky and Kahneman, 1983). The important difference from 'the fixed self' model is that people are assumed to have many mental models, which may not be consistent and are evoked by different situations. Experimental evidence shows that social comparison, outside-options, reference points and framing significantly affect behaviour. However, there is very limited evidence on the behavioural effects of inheriting wealth on labour-market outcomes and very few economics experiments have been run in South Africa.

[1] The number of people receiving social grants increased substantially from 2.5 million in 1999 (National Treasury, 2003: 104) to about 9.5 million in 2005 (National Treasury, 2005: 57).

[2] See Bingley, Corak and Westergärd-Nielsen (2011), Corak and Piraino (2011), Corak (2013) on intergenerational transmission of employers; Björklund, Lindahl and Plug (2006), Björklund and Jäntti (2009), Brunori, Ferreira and Peragine (2013) on intergenerational income mobility and family background; Nattrass and Seekings, 2005), Magruder (2010) on intergenerational networks; Borgerhoff Mulder *et al.* (2009) on types of intergenerational wealth transmission in small scale societies; de Graaf and Kalmijn (2001) on cultural and economic relative status; Chauduri *et al* (2006) on intergenerational transmission of advice and social norms; Hoff and Pandey (2009, 2014) on identity effects of inherited caste in India.

The focus of the present experiment is on framing, and how it interacts with differences in background to elicit identities that affect behaviour. This topic has implications for how workplace hierarchies and educational institutions are constructed. It is argued that an initial priming of participants in an experiment that cues them to think about inherited status has a behavioural impact on task performance. Based on the theoretical and empirical literature, two main research questions are posed: (i) Does a high/low framed inherited-wealth status in the lab affect task performance (measured by the number of sliders solved in a real-effort slider task on a computer?)[3] and (ii) Does an inheritance-framed endowment of wealth trigger identity effects (as opposed to a lottery-framed endowment)?

Section 3 presents a novel lab experiment that tests the effect of a framed inherited-wealth status in a real-effort task. The piece-rate incentive structure is the same for treatment and control groups: one South African Rand (ZAR) for each slider solved in a computerized slider task (Gill and Prowse, 2009). Students were recruited at the University of Cape Town and 320 participated. The inheritance TREATMENT condition (**ITR**) is a low, medium or high endowment framed as an inheritance from a parent-player. The inheritance frame attributes their relative status to the slider-task performance of the parent they are matched with. Quite a light relative status treatment is motivated for with reference to the literature on priming and identity effects in experimental economics.[4] In the CONTROL condition (**CTR**), participants are randomly assigned a low, medium or high lottery-framed endowment.

Section 4 presents the results and relates them to the existing literature. Section 5 contains the general discussion and limitations of the experiment, and makes recommendations for research going forward. Section 6 concludes with a summary of significant findings and considers the relevance of the experiment.

2 The impact of inherited-wealth status on individual behaviour

The literature on the intergenerational transmission of inherited-wealth status is diverse and draws on economics, sociology, and psychology. It can be organized into two broad themes. The first theme draws on the more traditional econo-

[3] A slider is initially positioned at zero. The peg of the slider can be moved to any integer value between 0 and 100 using the mouse by clicking on it, dragging and dropping it. The aim is to position the peg of the slider exactly on the midpoint of the slider at 50. In the real-effort slider task, participants are presented with 48 sliders (all initially positioned at 0) on their computer screen, which they attempt to position correctly within 2 minutes. It is an individual level task with a piece-rate compensation: 1 ZAR for each slider positioned correctly.

[4] Hoff and Pandey (2006, 2014) on effects of revealed social identity (caste) and cognitive task performance; Benjamin, Choi and Strickland (2007) on social identity and preferences; Ellingsen, Johannesson, Mollerstrom and Munkhammar (2012) on how social framing affects beliefs; and Hauser *et al.* (forthcoming) on behavioral effects towards the rich and the poor when selectively revealing inequality in the lab.

metric literature of intergenerational mobility and inequality. This research typically offers strong evidence of intergenerational transmission of income and occupation across countries (Corak, 2013; Piketty, 2013; Corak and Piraino, 2011; Magruder, 2010).[5] The second theme, on which this review focuses, investigates social reproduction (Bourdieu, 1973), the psychology of identity (e.g. Hoff and Pandey, 2014), the psychological impact of poverty (Mullainathan and Shafir, 2013), the effect of power and powerlessness on executive functioning in the brain (Guinote, 2007), and social comparison (Cohn, Fehr, Herrmann and Schneider, 2014) in terms of effort provision, cognitive performance and motivation. There is a sizeable psychology literature that shows that simply making an identity salient to experimental participants induces behavioural change (Hoff and Pandey, 2014; Benjamin, Choi and Strickland, 2010).

While there is an abundance of discussion in the theoretical and empirical literature on the motivation behind leaving bequests and the impact on inequality, there is little research about the impact of receiving an inheritance on individual behaviour and motivation in the labour market.[6] The difficulties of isolating

[5] Borgerhoff Mulder *et al.* (2009) examines how easy it is to transmit success from one generation to the next, or what characteristics of a society promote greater heritability. The paper shows that parents choose to transmit the type of wealth to their children that is most valued by that society (e.g. material wealth, or practical knowledge). Systems where one generation can bequeath material capital to their descendants such as property rights are associated with higher inequality (e.g. the average Gini coefficient is 0.48 in agricultural societies) compared to systems where that form of transmission is minimal (e.g. an average Gini coefficient of 0.25 in hunter-gatherer societies). For example, among the Hadza hunter-gatherers in Tanzania, the types of wealth transmitted are body weight (β = 0.305), grip strength (β = -0.044) and foraging returns (β = 0.047). In contrast, for the Yomut agricultural population in Turkmenistan/Iran the type of wealth transmitted was land (β = 0.528). The IGT coefficients for agricultural societies are noticeably stronger than those of hunter-gatherers. Averaged across all societies, the IGT of material wealth (β = 0.37) is stronger than embodied (β = 0.12) or relational wealth (β = 0.19), and the societies for which material transmission of wealth is the highest predictor of success show more inequality. The finding that heritability of material wealth drives inequality in small-scale societies is consistent with Piketty's (2013) observations on inheritance and the persistence of inequality using cross-country data from the nineteenth and twentieth centuries.

[6] Lifecycle accumulation and inheritance are the two main explanations of wealth inequality (Davies and Shorrocks, 2000). Piketty (2013) argues that the inheritance channel is the greatest driver of intergenerational inequality (underlying this is the top few percent of the population becoming exponentially richer) because of the faster rate of capital growth versus the growth rate of the national economy. He captures the seemingly inevitable phenomenon of growing inequality in 19^{th} and 20^{th} century Western economies with the simple inequality r >g. In a survey of retirees enrolled in the US academic pension plan TIAA-CREF, Laitner and Juster (1996) found that a substantial amount of the sample with children (46 percent) report that leaving an inheritance is "very important" or "quite important". Even 23 percent of those with no children report that leaving an estate as important. In a baseline attitude survey of our own sample of participants at the University of Cape Town, 59 percent agreed with the statement "Every parent should strive to leave an inheritance for their child". Interestingly, only 30 percent agreed with the statement "You think an inheritance tax is fair". Interestingly, this does not differ between those that expect to inherit wealth from their parents and those that do not expect to inherit anything.

There is diversity in bequest behavior of families as well as attitudes toward intentional transfers of wealth to children (Laitner and Juster, 1996). The two main models of intentional transfer behavior are the altruistic and exchange-based models (Davies and Shorrocks, 2000). Laitner and Juster's (1996) findings on pensioners are consistent with the altruistic

the effects of nature versus nurture on labour market outcomes are extensive as the two are inevitably interrelated. Understanding the causal mechanisms underlying mobility and intergenerational status effects arguably requires creative measurement approaches. For example, Björklund, Lindahl, and Plug (2006) studied orphans to isolate nature and nurture effects in a natural experiment that addressed the endogeneity problem. An alternate approach that allows researchers to isolate causal mechanisms thought to influence labour-market behaviour is to run experiments (for a review see Charness and Kuhn, 2011). Below, several theoretical frameworks and experimental evidence is examined in order to begin to understand the individual behavioural effects of inherited-wealth status.

2.1 Bourdieu on social reproduction: How inheriting high status promotes higher performance

One perspective that speaks to the effects of inherited high status is that of French sociologist Pierre Bourdieu. Bourdieu's (1973) theory explains the reproduction of the structural power relations between classes, in particular through the distribution of cultural capital. He argues that the educational system contributes to the intergenerational transmission of power and privilege. The institutions of education (e.g. universities and museums) exist to conserve culture inherited from the past and transmit accumulated information to the next generation (Durkheim in Bourdieu, 1973). While in theory such institutions are owned by all classes of society, Bourdieu (1973) observes that museum and theatre visitors, for example, highlight the fact that inheritance of cultural wealth appears to only belong to the individuals with the tools to appropriate it for themselves (Bourdieu, 1973). He shows that attendance is strongly correlated with higher education and the privileged social classes. Thus, the transmission, usefulness and pleasure of cultural wealth generally remain the monopoly of certain classes in society despite the absence of explicit financial obstacles (at least in the case of museum entry) (Bourdieu, 1973). The system reproduces existing power relations since high status and early fluency in the "code" used to understand the dominant culture depends greatly on family background, and this advantage is then solidified in educational institutions when individuals from "cultured families" are better equipped to take advantage of the cultural capital on offer (Bourdieu in Brown (ed.), 1973: 70). Thus, Bourdieu's theory predicts that high-inherited status, and the privileges it embodies, is self-reinforcing across generations and greatly increases an individual's probability of success.

model. Exchange based models present a *quid pro quo* strategic motive to leave bequests in order to gain "attention" from potential beneficiaries (Davies and Shorrocks, 2000). A third sociobiological explanation sees bequests of wealth as human kin investment (Smith, Kish and Crawford, 1987). One study finds that in an analysis of 1000 bequests, beneficiaries are favored according to their degree of relatedness to the bestower of wealth and also to their reproductive value (Smith *et al.*, 1987). The intergenerational transfer of wealth is explained by the provision of resources towards reproductive competitiveness (Smith *et al.*, 1987).

There is an empirical foundation for the hypothesis that high status leads to better performance. Typically, cognitive neuroscience researchers have tended not to research low and high socioeconomic status (SES) participants to the same extent as middle SES individuals because they are relatively more difficult to access (Hackman and Farah, 2009). An alternative creative method has been used to examine the effects of social rank on cognitive performance. Namely, manipulating power relations in the lab to simulate relative status within a social hierarchy (Hackman and Farah, 2009). In an experiment that measured participants' ability to complete the framed-line test (which measures the degree of attention focused on an object and its context), Guinote (2007) showed that power affects basic cognition and executive functioning.[7] Compared to individuals randomly primed to powerlessness, powerful individuals were more able to inhibit peripheral information (i.e. tune out irrelevant distractions when required), and focus their attention on the task at hand (Guinote, 2007). The ability to selectively focus attention more effectively improves perception and judgment and has a significant effect on behaviour (Guinote, 2007). This means that situations that make one's power or high status salient have a positive effect on cognitive task performance. The evidence speaks to the process through which framing in the present lab experiment can affect task performance.

2.2 An alternate theory: Inheriting high status leads to an entitlement effect

Many academics, from historians to psychologists to economists, are interested in how identity influences behaviour (Hoff and Pandey, 2014). Joseph Schumpeter's (1934) observations had a defining effect on economics in the first half of the 20^{th} century and illuminate the present investigation of intergenerational relative status.[8] Schumpeter (1934) imagined that capitalism would reproduce itself in a "circular flow" that saw no swelling in the creation of wealth except from spurts of innovation generated by entrepreneurs. The process of 'creative destruction' would drive social mobility as newly successful entrepreneurs and their families drove out the old, particularly the subsequent generations that inherited the wealth but not entrepreneurial ability. He theorized that actions taken to earn wealth are driven by the desire for the status implicit in success. Schumpeter posed that wealth is a convincing signal of relative status because it is objectively measurable. He speculated that individuals are motivated by a wide array of reasons to succeed but that individual behaviour is shaped by the "acquisitionist society" of capitalism in which people live. This is echoed

[7] Participants were randomly assigned to a powerful or powerless treatment group and primed accordingly. In the powerful condition, participants were instructed to write a story about a particular event in which they had power over another person(s), and indicate on a scale of 1-9 how "in charge of the situation" they felt in that incident (Guinote, 2007). Power was explained to be a situation in which they had control of the capacity of someone else to get something that they desired or they were in a position to assess people (Guinote, 2007: 688). In the powerless condition, participants described a powerless incident that they had experienced and rated it on the same 1-9 scale.

[8] For an insightful analysis see Heilbroner (1999).

by Bowles' (1998) view that preferences are endogenous to the institutions and rules in which decision makers exist. Schumpeter posited that the generation of children born into high status, rather than having won it through entrepreneurial ability and competition like their parents, would not be motivated to the same extent to succeed. It is speculated that a factor behind the potential for the slacking behaviour of the second generation may be entitlement to engage in leisure – or simply lack of sufficient incentive to work hard (because they inherit wealth and high status).

There is also empirical evidence to support the notion of the demotivating effect of inherited high status. A behavioural economics experiment in India (where the measure of task performance was the number of mazes solved) showed that under piece-rate incentives, high-caste boys underperformed by about 20% when caste was made salient by publically revealing it in a classroom with only high caste boys (Hoff and Pandey, 2014). The authors argue that the most plausible explanation is that segregation is a signal of high-caste dominance and activates a sense of entitlement (Hoff and Pandey, 2014).[9] This prompts high-caste boys to feel less of a need to achieve a high score. In the caste system, social supremacy is "assigned by birth rather than by competition" (Béteille, 2011 in Hoff and Pandey, 2014: 120). Hoff and Pandey (2014) discuss two sets of theories about how social identity affects performance, which can be usefully applied here to the study of inherited-wealth identity effects. The first model is 'the fixed self' and the second is 'the frame dependent self'.

'The fixed self' model comprises a set of theories which hold that an individual has constant, well-defined preferences and capacities, at a particular moment in time. This view is the standard model in economics. It teaches that these fixed preferences and abilities contain all the information that is necessary for describing an individual's decision-making, if the individual is presented with a set of options. That is, various social identities, which they share with other people, have no influence on the individual's preferences; hence, the fixed self.[10]

'The frame-dependent self' theories are generally favoured by social science disciplines outside of economics (Hoff and Pandey, 2014). The approach is psychologically oriented and takes into account how the mind is thought to process information using "mental models" (Tversky and Kahneman, 1983). The important difference from 'the fixed self' model is that people are assumed to have many mental models, which may not be consistent and are evoked by different situations. This theory is supported by diverse experimental evidence. For example, Benjamin *et al.* (2010) showed that when people were randomly assigned to fill out background questionnaires that primed them to an aspect of their identity as Asian, they were more cooperative and patient than individuals who filled out a questionnaire that did not relate to their identity. In another

[9] Prior research showed that revealing caste did not lower the self-efficacy (or self-confidence) of high-caste boys (Hoff and Pandey, 2005).

[10] The broader theory (supported by empirical results) includes social identities into individual preferences and argues that a particularly social identity is ruled by norms of behavior (e.g. Akerlof and Kranton, 2000). Under this extended model, individuals prefer to conform to the norms of the social category they identify with.

experiment in which race identity was primed, African Americans also made more patient choices (Benjamin, *et al.*, 2010).

The above theories and evidence suggest that making low relative status salient to an individual could be expected to negatively affect performance, while high relative status could be expected to either increase or decrease real-effort task performance.

2.3 Inheriting low status: Stereotype threat and underperformance

Hoff and Pandey (2014) found that in mixed caste groups, making caste salient by revealing it to participants, leads to a 23% caste gap in performance (Hoff and Pandey, 2014). Since there was no caste differential in the control group, the gap is clearly not driven by an innate productivity differential. Instead, the authors argue that social identity influenced behaviour (Hoff and Pandey, 2014). In particular, there is a discouragement identity effect for low-caste boys. This relates to a large psychology literature on stereotype threat. For example, Steele and Aronson (1995) demonstrate the negative effect of stereotype threat on cognitive task performance of African Americans, while Spencer, Steele and Quinn (1999) show its negative effect on women's performance in math. Croizet and Claire (1998) extend the concept of stereotype threat to social class. Their experimental results showed that when the instructions for the task described it as a test of intellectual ability, the performance of low socioeconomic status (SES) individuals suffered (Croizet and Claire, 1998). The authors refuted the explanation of a SES differential in intellectual ability by showing that when the test is not presented as an intellectual diagnostic, there is no intellectual performance differential by SES. It is commonly observed that hints or signals about a person's identity – if it is stereotyped as inferior – undermines their capacity to successfully perform reasoning tasks. This is supported by Hoff and Pandey's (2014) finding that low-caste boys solve fewer mazes (by over 20%) when caste is publically revealed and only low-caste boys are present in the classroom. The significant decline in performance can only be attributed to identity effects of the low-caste inferiority stereotype since there is no innate productivity differential (Hoff and Pandey, 2014).

In their book *Scarcity*, Mullainathan and Shafir (2013) propose a theory of the psychology of scarcity. They review numerous experiments in the lab and in the field that address the question of how people's behaviour changes when they are prompted to feel scarcity or abundance. In one experiment, shoppers were surveyed in a mall and primed to think of money stresses before doing a fluid intelligence test (Mani *et al.*, 2013). When prompted to think of small expenses (car repairs less than $100), this had no significant effect on the scores of the relatively rich or poor (using self-reported income) (Mani *et al.*, 2013). However, when prompted to think of large expenses (costly car repairs of over $1000) the poor scored significantly lower than the rich on the intelligence test. Mullainathan and Shafir (2013) attribute this to decreased 'bandwidth' – the poor now have more on their minds. In another experiment to elicit scarcity,

Princeton students played the game 'family feud' and were assigned to be either 'time rich' or 'time poor'. Additionally, participants were allowed to borrow time to add more seconds to the clock for that round. Mullainathan and Shafir (2013) remark on the similarities between the behaviour of 'time poor' students borrowing time in the experiment and poor individuals in the real world taking out short-term, high-interest loans with no reason to expect their pecuniary circumstances to improve. They conclude the psychology of scarcity often leads to a 'scarcity trap'.

The above findings suggest that an inherited low status could elicit identity effects that negatively impact real-effort task performance, and also that drawing attention to monetary scarcity could lower individual task performance. Clearly, it is important to isolate inherited relative status from the endowment of wealth associated with it.

2.4 Social comparison and effort provision: Relative status matters to us at work

Relative income has long been viewed as having an impact on individual welfare and behaviour. Consumption satisfies the wants of individuals and can also obtain the reverence of those around them (Veblen, 1899). Individual satisfaction (after basic needs are met) is highly dependent on the consumption of other people they compare themselves to (Hirsch, 1976). A problem arises since relative standing matters for individual choices but the seeking of it may result in inefficient outcomes for society (Oxoby, 2003). People "compete for relative position rather than (absolute) performance" and while the relative high status may satisfy individual welfare, only higher absolute performance leads to socially optimal growth (Oxoby, 2003: 367). Social rank in the economy is inherently a scarce resource. Under the psychology theory of cognitive dissonance (originally proposed by Festinger, 1957), individuals that do not acquire status experience psychological discomfort, leading to cognitive and behavioural effects (Oxoby, 2003). The discomfort is viewed to result from inconsistency between the yearning for self-esteem and the lack of social deference (Aronson, 1994). Oxoby's (2003) model of status seeking incorporates cognitive dissonance. The theory predicts that cognitive dissonance may either cause people to invest more effort in status seeking or rationalize their current rank, by adjusting their attitude to what determines status (Oxoby, 2003). In contrast to the literature presented earlier, the cognitive dissonance theory of 'status seeking' presents the case that making low relative status salient could drive greater effort provision by individuals.

While experimental evidence that can speak to a causal effect of social comparison on effort provision and other behaviours is scarce, there are some striking empirical findings in the literature. Akerlof and Yellen (1990) introduced an economic model in which social comparison could lead to involuntary unemployment, if the worker is assumed to withhold their effort when payment is below a "fair wage". This "fair wage" depends on the financial compensation of their co-workers. In making inequality salient, a few experiments have been

able to show that the 'Haves' and 'Have Nots' and where individuals fits into the social structure matters. Using functional MRI (fMRI) scanners, researchers showed that social comparisons affect reward-related brain activity (Fliessbach *et al.*, 2007). When two subjects simultaneously perform estimation tasks in fMRI scanners position next to each other, changing the comparison participant's payment influences brain responses in the ventral striatum. Thus, the income of people that individuals compare themselves to matters - down to the physiological level.

Moving beyond the lab, Cohn, Fehr, Herrman and Schneider (2014) analyzed the effects of social comparison and effort provision in a field experiment in which a worker's own wage or that of colleague's was reduced. Workers were randomly assigned into pairs and performed the same task individually for the same constant hourly wage. The authors found that cutting the pay of both workers lead to a decline in performance. Interestingly, cutting only one of the worker's wages had an even worse effect on the performance of the unfortunate worker who received less and knew that his co-worker did not get a pay cut (more than twice the effect of the other treatment). Workers whose compensation was not reduced but who knew their colleague's pay was cut, experienced no change in performance compared the control group where neither workers' pay was changed. This finding is supported by a job-satisfaction study by Card, Mas, Moretti and Saez (2012) which found that giving university employees information that they were below the median income was linked to higher willingness to look for employment elsewhere and lower job and wage satisfaction. There was no effect for those above the median income (Card *et al.*, 2012). These results suggest that social comparison matters less to people when it is in their favour but has remarkably strong behavioural, psychological and physiological effects when they are on the losing side. This supports the cognitive dissonance theory that people care about their relative position (not their absolute performance) and that a disconnect between their desire for higher status and the one they hold leads to psychological discomfort. This, in turn, affects behaviour.

3 Experiment design

Given the theoretical and empirical evidence discussed above, it is argued that an initial priming of participants in an experiment that cues them to think about inherited status has a behavioural impact in a real-effort task. This paper addresses the following research questions: (i) Does a high/low inherited-wealth status framed in the lab affect task performance (measured by the number of sliders solved in a real-effort slider task on a computer? and (ii) Does a low/high inheritance-framed endowment elicit identity effects on performance? Below, a novel experiment designed to test these questions is presented.

First it is important to understand the measure of performance used called "the slider task".[11] In the slider task, participants sit in front of individual com-

[11] The basic z-Tree code for the slider task was obtained from its developers Gill and Prowse (2009).

puter screens that display 48 "sliders" which they attempt to correctly position at the halfway point between 0 and 100 within the two-minute time limit.

At the start, all the sliders are positioned at 0 (see Figure 1a). Each slider can be adjusted to any integer value along the line including 0 and 100. There is no limitation on the number of times a slider be readjusted. Consecutive sliders are not aligned in order to make each slider equally challenging. On the right hand side of each slider is displayed the slider's current position. A participant's score is equal to the number of sliders correctly positioned at 50 (see Figure 1b) when the allocated time runs out. Sliders that are positioned at values besides 50 (e.g. at 43) do not contribute to the score. The score is interpreted as "effort exerted". Each participant is shown exactly the same arrangement of sliders on the screen (see Figure 2). Two practice rounds (of two minutes each) allow participants to familiarize themselves with how to move the sliders using the mouse.[12]

With regard to criticisms of this method, there is concern amongst some researchers about the more abstract real-effort tasks, for example, the slider task, solving mazes or mathematics problems (Dutcher, Salmon and Saral, 2015). Even though these tasks involve an action, as opposed to choosing a hypothetical level of effort from a list (called stylized effort), they are criticized as "trivial" real-effort tasks because participants' effort can only be said to be meaningful inside the lab (Dutcher, *et al.*, 2015). High effort in the slider task results in no actual output outside the lab (i.e. there is no job which involves repetitively positioning sliders) unlike for example usefully filling envelopes with letters that will be used for business purposes and can be interpreted as a real job (Dutcher, *et al.*, 2015). However, it can also be argued that tasks which are closer to real jobs are really more like field experiments and thus, are only generalizable to very similar settings (e.g. in the case of employees stuffing envelopes, this task could generalize to jobs where people engage in tedious office tasks) (Dutcher, *et al.*, 2015). There is very little empirical evidence one way or the other. Moreover, an experiment by Dutcher *et al.* (2015) found that the three types of effort 'stylized', 'trivial' and 'useful' result in identical decision-making in public goods experiments. Based on this evidence, it cannot be argued that the real-effort task based on sliders is fundamentally more or less externally valid than other real effort models.

In the experiment, payment includes (i) a random starting endowment (0 (Low), 70 (Medium), or 140 ZAR (High), and (ii) potential income of 1 ZAR per

[12] The use of a real-effort task – in particular the computerized slider task - is motivated based on its use in a diverse range of experimental designs and its capacity to discern nuanced changes in behavior (Charness and Kuhn, 2011; Gill and Prowse, 2009). It is a good measure of the amount of effort applied since there is negligible space for randomness or guessing (unlike counting characters). It does not test existing knowledge and is easy to explain and understand (unlike mathematical optimization problems). The task is also identical across repetitions and thus a consistent instrument (Gill and Prowse, 2009). While some of these advantages are shared by the stuffing envelopes task, the slider task is arguably a finer measure, can be completed without any physical materials (i.e. no stationary required), provides real time data to the experimenter, and elicits a wide variation in scores. Moreover, the slider task shows no significant difference in performance between men and women.

slider positioned correctly, (iii) a 25 ZAR show-up fee.[13] The probability of receiving each endowment is equally likely.[14] The experiment uses a between-subjects design. There are two main **treatments** as follows:

1. **Control treatment (CTR). A lottery-framed endowment**

Randomly allocated starting endowments are framed as the outcome of a lottery. Three subgroups: low-, medium-, and high-endowment. Below is an extract from the instructions.

"Before you do the task, you will be given an endowment of money. The endowment that you start with is one of 3 possible real amounts of money. You will either get 0 or 70 or 140 Rand. Your endowment has been randomly assigned to you. In a moment, before you begin the task, you will be shown the value of your endowment. When you entered the room today, you were each randomly assigned a number which indicated the computer you should sit at. Each computer has been programmed with a particular starting endowment value. The endowment you receive will depend on which computer you end up sitting at. This is a random process, like flipping a coin or rolling dice."

"... You should now see your starting endowment in Rands on your screen. This starting endowment is separate from the money you may earn during the task. In a moment, I will explain the task to you. But at the end of the task, you will be paid the value of your starting endowment that you received through the random allocation of computers, together with any money you earn during this session. This means the amount of money that you earn will depend partly on your effort in the task and partly on random chance, namely which computer you ended up at."

Varying the endowment level within the lottery-frame allows the comparison of participants' behaviour when they are randomly assigned a high endowment to participants that are randomly assigned a low endowment. During the slider task, several live pieces of information are displayed at the top of the screen. Namely, (i) starting endowment (0, 70 or 140 ZAR), (ii) the round number (3 rounds in total including 2 practice rounds), (iii) the number of sliders currently solved, and (iv) earned income in the task thus far.

2 **Inherited-wealth treatment (ITR): An inheritance-framed endowment**

Participants are told that they are matched with a parent – someone who did the task before them – and their starting endowment is determined by the performance of their parent. Three subgroups: Low-, Medium- and High-endowment. The key difference from the **CTR** is the framing of how their random fortunes were determined: inherit versus lottery. In one case, framing endowments as an inheritance of wealth makes the endowment attributable to

[13] The show up fee of 25 ZAR roughly corresponds to the cost of buying lunch on the university campus.

[14] The range of endowment values is chosen in order to be sufficiently inequitable to elicit variation in behavior while also satisfying the experiment budget.

another person versus the other case where accident is attributable to random luck. Being matched with a high status parent means you inherit a high relative status and high endowment. Similarly, low and medium status parents mean a bequest of a medium endowment 70 ZAR and 0 ZAR endowment, respectively.

In summary, each child is randomly matched with a parent, and the child's starting position is framed as depending on its parent's performance. The framing is quite light. It differs across treatments but otherwise the description of the task is neutral. There are no explicit legacy effects. Participants are not explicitly told that their performance would determine the inherited endowment of a descendant in the next round, neither does the experimenter explicitly deny this possibility. The present experiment analyses the effect of inheritance-framed endowments on a single generation of players. Below is an extract from the instructions for the inheritance-frame treatment.

"In this task, you will receive an endowment of money. The endowment that you start with will be one of 3 possible amounts. You will get 0 or 70 or 140 Rand. The endowment you receive will depend on the performance of the previous generation who completed this task. In other words, you are linked to a parent generation. Each of you in this room is matched to a parent, someone who has already completed the task. The performance of your parent determined how much you, as the child of that parent, receive as your starting endowment of wealth in this task."

"... You should now see your inherited endowment in Rands on your screen. I'll repeat: the amount will be 0 or 70 or 140 Rand. This starting endowment is separate from the money you could earn during the task. In a moment, I will explain the task to you. But at the end of the task, you will be paid the value of your inherited endowment that you received from your parent (based on how well or how poorly they performed the task) together with any money you earn during this session. This means the amount of money that you earn will depend partly on your actions in the task and partly on the performance and status of your parent."

"If your parent performed well and was very successful in this task, you will receive a high starting endowment of 140 Rand. You begin today's task with a high economic status. If your parent performed poorly compared to others, you will receive a low starting endowment of 0 Rand. You begin today's task with a low economic status. If your parent's performance in the task was average, you will receive a medium starting endowment of 70 Rand. You start today's task with a medium economic status."

Similarly to the **CTR**, several pieces of information are displayed at the top of the screen: (i) starting endowment value, (ii) the round number, (iii) the number of sliders currently solved and (iv) earned income in the task thus far. The additional information for the ITR is their Low/Medium/High relative status.

The sampling frame for the experiment was the list of students at the University of Cape Town. The experiment used a rolling recruitment strategy in which students volunteered to participate, in response to noticeboard posters and an email announcement to all students. Table 1 shows the implementation

of the experiment. Each session took approximately 40 minutes to run. In total, 31 experimental sessions were conducted at the School of Economics Teaching Lab in May 2016 at the University of Cape Town. For each session, Table 1 shows whether **CTR** or **ITR** was run and the number of participants in each of the three endowment categories. A caveat to the design is that the effect of the inheritance-frame condition is arguably stronger if participants do not know there is also a lottery-frame condition. A potential confound to the results is if participants discussed their experience with their friends who then participated after them. The number of students that participated in the lab experiment was 320. However, some did not complete the pre-experiment online survey, which collected basic information (e.g. gender, race, financial aid status), nor responded to a follow up request, so we have full information for 296 subjects.

Table 2 and Table 3 below show summary means of subject characteristics using questionnaire data collected before the experiment sessions. Non-parametric Kruskal-Wallis H tests are performed as a balance check for random assignment of subjects to treatment. Overall there are no concerning differences in subject characteristics between Lottery and Inherit groups. The experimental conditions are balanced on key variables of interest. Namely, on race, gender, financial aid status and expectation of an inheritance from parents. The proportion of the sample that is Black is 57% and the same proportion is female. Nearly 40% of the sample reports being on financial aid and 30% expects to inherit wealth.

In the present experiment, the only advantage (or disadvantage) that a child can inherit from their parent is their relative status and its associated endowment level of wealth. By comparing Lottery and Inherit groups at each endowment level, we test whether inherited-wealth status alone matters for the number of sliders solved (i.e. by controlling for starting endowment level). The analysis also addresses whether the inheritance-frame treatment triggers identity effects by doing separate analyses for each of the experimental conditions and comparing them. Varying the endowment level within the inheritance-frame allows for a comparison of participants' behaviour when they randomly inherit high status (and its associated wealth) to participants that inherit low status (and no wealth). Based on experimental evidence of framing and priming effects in the economic and psychological literatures, it is argued that imposing an experimental inherited wealth status is likely to elicit observable variation in behaviour (e.g. Hoff and Pandey, 2014; Benjamin *et al.*, 2010; Burnham, McCabe and Smith, 2000; Croizet and Claire, 1998).[15] The design allows the testing of two main hypotheses. Firstly, that inherited-wealth status affects effort in the slider task (after controlling for endowment). Secondly, that effort

[15] In lab experiment using repeated two person trust games, Burnham, McCabe and Smith (2000) showed that simply changing the term referring to the participant that an individual was paired with, from "counterpart" (neutral) to "partner" in one treatment or "opponent" in another treatment, caused a significant difference in trust behavior (Burnham *et al.*, 2000). This illustrates that simply changing one word in the experimental instructions (an arguably weak prime) is sufficient to induce a behavioral response. The experimental results of Burnham *et al.* (2000) support the reasoning that quite a light inheritance-frame in the present experiment could have a significant behavioral impact.

in the slider task (*within* the inheritance-frame and lottery-frame treatments, respectively) differs when starting endowment is low, medium or high.

4 Results

4.1 Descriptive statistics of real effort in the slider task

4.1.1 No significant difference in the distributions of task performance between lottery- (CTR) and inheritance- (ITR) framed conditions

The investigation of real-effort in the slider task begins by considering the pooled sample of 320 participants. Figure 3 below presents kernel density plots that compare the distribution of effort in the treatments **CTR** and **ITR**. Figure 3 is a preliminary visual test of whether inherited-wealth status made a difference to effort. Overall, there is no striking evidence of inherited-wealth status effects in the distributions when the number of sliders solved in **CTR** and **ITR** is compared at each endowment level: the distributions largely overlap. The Kolmogorov-Smirnov equality of distributions test statistics for all four panels in Figure 3 indicate no significant differences between lottery- and inheritance-framed endowments on task performance (p-values exceed the 15% significance level). Non-parametric skewness and kurtosis tests that address the null hypothesis of normality are also performed. The tests indicate that all distributions of number of sliders solved in Figure 3 are approximately normal. However, the medium-endowment Lottery and Inherit groups differ significantly from the normal distribution at the 10 percent level.[16]

4.1.2 No significant differences in task performance by endowment, within the lottery-frame and inheritance-frame treatment groups

To visually inspect for the effect of varying endowment level *within* each of the **CTR** and **ITR** treatments, refer to Figure 4. For **CTR** in Figure 4, panel (i), the distributions of low, medium and high endowments largely overlap but the peak of the low group is slightly to the left of the medium and high groups. For **ITR** in Figure 4, panel (ii), there is no convincing evidence that varying starting endowment makes a difference for effort. Kolmogorov-Smirnov tests indicate that none of the low, medium and high distributions differs significantly within the **CTR** and **ITR** treatment groups.

4.1.3 At the mean, relative status makes no difference to task performance

Table 4 below describes task performance for different starting endowments using summary means and standard deviations. Comparing the average number

[16] Tests to reject null hypothesis of normality for Medium Lottery group: adjusted Chi-squared with 2 degrees of freedom = 5.55, p-value = 0.062; Medium Inherit group: adjusted Chi-squared with 2 degrees of freedom = 5.58, p-value = 0.061).

of sliders solved across the **CTR** and **ITR** groups (within each endowment category) shows whether there is a relative status effect in the slider task, while the standard deviations describe the spread of the distribution for a particular subgroup. Note that the **CTR** is used to isolate inherited-wealth status by controlling for the starting endowment amount because this endowment assignment condition is not linked to status. Non-parametric tests indicate that that inherited-wealth status alone makes no difference to task performance. This means that for the pooled sample neither low, medium or high endowment groups differ significantly in their average effort between Lottery and Inherit conditions. With regard to the spread of the distributions, **ITR** has a higher standard deviation than **CTR** for low (5.00 versus 4.31 sliders) and medium endowments (5.80 versus 4.60 sliders).

In summary, visual evidence and simple summary statistics of the pooled sample show no significant inherited-wealth status effects. That is, on average, whether a particular starting endowment is framed as the result of a random lottery draw or is attributed to a parent player's actions makes no difference to participants' effort in the slider task. It is not clear yet if this is (i) a null result, (ii) a failure of the experiment to elicit relative status, or (iii) small sample bias. This is investigated next in the regression analysis.

4.2 Regression analysis of real-effort in the slider task

This section presents the empirical strategy and the results of simple ordinary least squares (OLS) regressions of the number of sliders solved (i.e. real-effort score) on treatment frame (i.e. Lottery **CTR** versus Inherit **ITR**) and starting endowment (i.e. Low/Medium/High).

4.2.1 Testing for relative status effects on task performance

A simple OLS model with robust standard errors is used to test for inherited-wealth status effects on real effort in the slider task. A causal claim can be made in regard to the intervention because of the experimental design and random assignment to treatment (Angrist and Pischke, 2010). Any differences in effort scores between comparable lottery- and inheritance-framed endowment groups is attributed to the intervention i.e. inherited wealth status. The underlying assumption is that if not for the treatment, the two groups (control and treatment) would have looked the same (Angrist and Pischke, 2010). In the experiment the lottery condition is used as a control group to isolate inherited relative status from inherited wealth (endowment). The dependent variable *Effort* (number of sliders solved) is treated as a continuous variable ranging from 0 to 48. This model provides a useful first look at whether relative status treatment effects are present.[17] The OLS regression specification proceeds as follows,

[17] We use the rough race categories Black and Non-Black as additional explanatory variables. This is motivated by descriptive statistics which show that self-reported White, Coloured and Indian (which I label Non-Black) perform similarly on the task to each other but not similarly to Black. See Appendix Table A1 for more detail.

$$\begin{aligned} Effort_i &= \alpha_1 ITR_i + \beta_1 Medium_i + \beta_2 High_i + \alpha_2 ITR_i * Medium_i \\ &\quad + \alpha_3 ITR_i * High_i + \delta X_{\mathbf{i}} + \eta_i \end{aligned} \tag{1}$$

where the unit of observation i is the individual. $Effort_i$ is a dependent variable equal to a participant's number of sliders solved in the task, ITR_i is a treatment dummy variable equal to 1 if randomly allocated to inheritance-frame treatment group and 0 if allocated to Lottery group (the omitted category), $Medium_i$is a dummy variable equal to 1 if randomly assigned to medium-endowment group and 0 otherwise, $High_i$is a dummy variable equal to 1 if randomly assigned to High endowment group and 0 otherwise (the omitted endowment category is Low), ITR_i *$Medium_i$ is an interaction term equal to 1 if the individual has a medium inheritance-framed endowment and 0 otherwise, ITR_i *$High_i$ is an interaction term equal to 1 if they have a high inheritance-framed endowment and 0 otherwise, $\boldsymbol{X}_{\mathbf{i}}$ is vector of additional control variables, and $\eta_i$is the unobserved error term.

4.2.2 Testing for primed identity effects

In order to test whether the inheritance-frame activates identity effects, the OLS model is performed separately for **CTR** and **ITR** groups on subject characteristics.

$$Effort_i = \delta X_{\mathbf{i}} + \eta_i, \ by(treatment)$$

where $\boldsymbol{X}_{\mathbf{i}}$ is vector of additional control variables, η_i is the unobserved error term and treatment refers to **CTR** or **ITR**. If identity effects (e.g. race) only become significant in **ITR** (and not **CTR**) then this indicates that it is the framing of the treatment that activates these identities. This follows since it was shown above that subjects do not differ significantly on characteristics. The description of the slider task is neutral and the identical across treatments. The difference between the two conditions is that **ITR** primes participants with an inherited-wealth status that determines their starting endowment, while **CTR** is an identity neutral lottery-frame.

- **Result 1: Low/medium/high inherited-wealth status does not affect task performance for pooled sample.**

The first column of Table 5 shows the regression results of our model of inherited-wealth status effects on slider-task performance (for the pooled sample of 320 participants).[18] No significant low, medium or high inherited-wealth

[18] In all regressions a control is included for prior task experience in a concurrent UCT experiment that used the slider task developed by Gill and Prowse (2009). The medium-endowment category differed significantly on this variable (i.e. 4 participants in Lottery group versus 11 in Inherit group). The low-endowment (5 versus 8) and high-endowment (12 versus 6) categories did not differ significantly. In total, 46 participants (14 percent) participated in the other slider task experiment.

status effect was found. It appears that for our sample inheritance-framed endowments are no different to the same endowments framed as a lottery in terms of their effect on the number of sliders solved. This supports the descriptive analysis of means earlier.

In the second column of Table 5 indicators for Black and female are included. The constant term is the average performance of Non-Black males in **CTR** and equals 15 sliders. The *Black* and *Female* coefficients are negative and highly significant. On average, Blacks solve almost three fewer sliders than Non-Blacks, given treatment, endowment and gender. Females solve two sliders fewer than males on average, holding all else constant.

There is no *a priori* reason why such productivity differentials should be observed in the slider task. Previously, the slider task has been shown to be an unbiased measure of effort provision with no significant difference between males and females (Gill and Prowse, 2009: 6). Moreover, in the descriptive statistics, we showed that **CTR** and **ITR** groups are balanced on race and gender. It is worth investigating further what underlies the unexpected race and gender performance gaps in the present experiment.

Table 6 shows that Blacks are less likely to expect to inherit wealth, and also less likely to have an economically active father, significant at the 1% level. Black participants solve 11 sliders on average, which is about 3 sliders fewer than Non-Blacks, and the difference is highly significant. The descriptive statistics presented in Table 6 supplement the findings of the inherited-wealth status effects model by showing which treatment subgroup elicits this gap in task performance: the low inheritance-framed endowment. In the low-endowment **ITR** group, Blacks solve 9 sliders on average, while Non-Blacks solve about 14 sliders - a significant difference at the 1% level. Compared to all other **CTR** and **ITR** subgroups, the lowest average performance for Blacks is in the low-inherited endowment category. In contrast, Non-Blacks average performance in this category is relatively high, compared to all other treatment subgroups. Note that the socioeconomic status differences observed by race are not significant by gender. On average, the female sample is younger with an average age of 20.42 years compared to males at 21.81 years. Interestingly, the gender gap in task performance only appears to arise in the **CTR**, in particular, the medium- and high- endowment **CTR** groups.

- **Result 2: ITR triggers the race gap in task performance; CTR does not.**

Table 7 OLS regressions examine the effect of race and gender on the number of sliders solved *within* **CTR** and **ITR** groups, respectively. There are no endowment effects on task performance. As one would expect, from the above descriptive statistics by race, the differential in average task performance between Blacks and Non-Blacks is only present in the inheritance-frame condition. There is no significant race gap in the **CTR**. Based on the descriptive statistics and regression analysis, it is inferred that the difference in task performance by race is not an inherent productivity differential for the sample.

One possible explanation of the race gap is an identity effect triggered by experimental-framing in the **ITR**, where endowments of wealth are linked to inherited-relative status. **CTR** is neutral in sense that it does not cue participants to any aspect of their identity. **CTR** would thus not be expected to trigger an identity effect since the random endowments in this treatment are presented as the result of pure luck. A counter to this is the possibility that one group feels more "unlucky in life". Differential responses to inheriting a low endowment by Blacks and Non-Blacks can explain the race gap in number of sliders solved. A part of the gap is due to Non-Blacks performing better on average when assigned a low inheritance-framed endowment as opposed to a low lottery-framed endowment. This relates to the cognitive dissonance literature that predicts that individuals invest more in status seeking (e.g. solving more sliders) when their desire for self-esteem is not met by their lack of social rank (e.g. inheriting a low status in the experiment) (Oxoby, 2003).

The other part of the race gap is due to lower relative performance by Blacks on average when they inherit a low endowment in the lab. This observation relates to the stereotype-threat literature, which holds that situations that trigger an identity stereotyped as intellectually inferior can undermine a person's cognitive performance (Hoff and Pandey, 2014). The apartheid legacy of social class largely determined by race (where Blacks suffered the greatest discrimination) arguably creates the foundation for such a stereotyped threat for Black participants.

The case for differential identity effects of relative status framing will be examined further below. However, note that this hypothesis cannot be tested conclusively in the absence of a second control group with only the piece-rate slider task and no endowments. It cannot be decisively ruled out that this result is an artifact of the sample. The extent to which the race gap is due to Blacks or Non-Blacks is also beyond the scope.

Triggering an identity: 'The Prince and the Pauper'

The hypothesis that experimental framing triggers the race gap observed in the **ITR** has empirical support. As discussed earlier in the experimental design, research shows that simply changing one word in the instructions to weakly prime individuals is enough to elicit a change in behaviour. Recall that Burnham *et al.* (2000) showed in the lab that simply changing the term used to describe the player that an individual was paired with, from "counterpart" (neutral frame) to "partner" in one treatment or "opponent" in another treatment, caused a significant difference in trust behaviour. Evidence from neuroscience experiments indicates that priming individuals to 'powerlessness' (by manipulating social status in the lab) negatively affects cognitive functioning (Guinote, 2007). Moreover, Hoff and Pandey (2014) demonstrated that cues making caste salient led to a gap in performance, where low-caste boys solved fewer mazes than high-caste boys. Caste in India is arguably analogous to race because it is also an institutionalized (socioeconomic) status assigned by birth rather than competition (Betéille, 2013 in Hoff and Pandey, 2014). In the present experiment, when **ITR** makes the notion of inheriting status and wealth salient, the data generating process may be expected to differ by whether an individual

expects to inherit wealth from their parents; mediating the effect of the intervention. Given the South African apartheid legacy where class and status were principally determined by race, it would be surprising if race were not linked to inherited-wealth status in the experiment, as well as to the expectation of inheriting wealth from one's actual parents outside the lab.

To simplify the analysis for the reader and (not to confuse with the experimental inheritance treatment) all participants who expect to inherit wealth from their actual parents are called *Princes* and those who do not have this expectation *Paupers*. These terms are borrowed from Mark Twain's (1881) children's classic *The Prince and the Pauper* – a story set in 1547 about two young, identical boys from opposite ends of the social hierarchy who meet one day and switch places with one another.[19]

- **Result 3: Princes solve more sliders if they inherit low status, but Princes solve fewer sliders if they inherit high status. No robust status effects on Paupers' performance.**

Since Black and Non-Black participants differ significantly on the expectation of wealth from their parents (with Blacks much less likely on average to be a Prince(ss)), the relative status model is examined separately for Princes and Paupers. Here, the key interaction between the experimental inheritance-frame (in the lab) and the expectation of inheritance in life (outside the lab) is considered. Table 8 shows the results of the model of inherited-wealth status effects for (i) Princes and (ii) Paupers, respectively.

In the first panel of Table 8, column 1 shows the basic model for Princes only. The significant *ITR* coefficient shows that low inherited-wealth status affects task performance, at the 10% level. Specifically, on average Princes assigned a low **ITR** endowment solve about 15 sliders, which is three sliders more than Princes with a low **CTR** endowment (12 sliders). This result is consistent with behavioural predictions of cognitive dissonance theory. Namely, an inconsistency between the desire for self-esteem and a lack of social rank (in this case from low status in the lab) can trigger psychological discomfort and observable changes in behaviour, as individuals invest in seeking higher status (i.e. by solving more sliders in **ITR** versus **CTR** where status is not salient).

The coefficient on the interaction term *ITR*High* (about 5 sliders) is negative and significant at the 10% level. On average Princes that receive a high **ITR** endowment solve 13 sliders.[20] The average performance of Princes with a high **ITR** endowment is 2 sliders less than Princes with a low **ITR** endowment (about 15 sliders). The opposite signs for low and high inherited-wealth status are very interesting. Low inherited-wealth status in the experiment appears to motivate Princes to perform better while high inherited-wealth status seems to induce the opposite.

[19] We ask the reader to suspend judgment on gendered terminology for the sake of a useful analogy.

[20] To get the predicted average performance for high status Princes we let Inherit=1 and High=1. Then add the significant coefficients *Inherit* and *Inherit*High* to the constant which gives their average performance. The coefficient on *High* is not significant.

The decline in Princes' performance could arguably be attributed to an entitlement effect since high inherited-wealth status can be interpreted as dominant. This is drawn from Hoff and Pandey's (2014) explanation that an entitlement effect explains the 20% decline in the number of mazes solved by high-caste boys, when caste was revealed (and the classroom contained only high-caste individuals) compared to the control when caste was not publically revealed. The authors showed in previous work that the decline could not be attributed to lower self-efficacy beliefs. Moreover, according to cognitive dissonance theory, individuals tend to care more about relative social rank than their absolute performance (Oxoby, 2003). The result that high-status Princes solve fewer sliders than low-status Princes is consistent with cognitive dissonance theory. The low and high inherited-wealth status effects on Princes are robust to additional controls for race and gender (see panel (i), column 2) and having an economically-active father (see panel (i), column 3). No gender gap is found in average task performance for the sample of Princes(ses), but the race gap of 4 sliders is still significant. Including a dummy to control for having an economically active father reduces the race gap in average performance slightly (from -4.153 to -3.796 sliders) but it remains significant at the 1% level. Note that having an economically active father is not a significant explanatory variable of number of sliders solved by Princes.

Moving to consider Paupers in the second panel of Table 8, column 1 shows the basic model. Low inherited-wealth status does not significantly affect Paupers' task performance. However, the sign is negative and opposite of that for Princes. High inherited-wealth status does significantly affect Paupers' performance. On average, Paupers with a high **ITR** endowment solve 2 more sliders than those that receive a low **ITR** endowment. This suggests that while high inherited-wealth status leads to a decline in Princes' performance, it may encourage Paupers to perform better. However, the high inherited-wealth status effect for Paupers is not robust to controls for Black and female (see panel (ii), column 2). The *Black* coefficient is significant at the 5% level, indicating that after controlling for treatment, Black Paupers solve 2 sliders fewer on average than Non-Black Paupers. Including a dummy for having an economically active father (see panel (ii) column 3) makes the female dummy lose its significance. This suggests that for Paupers, some of the variation in performance previously captured by the female dummy can instead be attributed to differences in socioeconomic background.

To supplement the regression analysis above, heterogeneity is visually inspected for in low and high inherited-wealth status effects using box-and-whisker plots. They provide a quick five-number summary of the number of sliders solved, visually show if the data is spread differently for subgroups and highlight outliers that fall outside 1.5 times the upper quartile. The top 50% of the group is everything above the median line that divides the box into two sections. Individuals in the top 25% are shown in the top "whisker" and dots above the box. Dots represent outliers that performed a lot better (or a lot worse) than normal in the slider task. The minimum and maximum (excluding outliers) are represented as the bottom and top bars of each whisker. Below,

Figure 5 shows the distribution of number of sliders solved by treatment for the two subsamples. The first panel of Figure 5 plots the number of sliders of (i) Princes, and the second panel plots the number of sliders of (ii) Paupers. The significant inherited-wealth status effects found in the regression results above (in regression specification 1) are highlighted by red arrows. At a particular starting endowment level (i) Low, (ii) Medium or (iii) High, an upward arrow shows that an **ITR** endowment leads to more sliders solved than the same amount as a **CTR** endowment, while a downward arrow shows that an **ITR** endowment leads to relatively fewer sliders solved than **CTR**.

- **Result 4: ITR triggers Prince-identity effects on task performance. In CTR, Prince-identity has no behavioural impact.**

Next, in Table 9, endowment level is interacted with Prince/Pauper status to test which endowment conditions trigger significant identity effects and elicit a performance gap between Prince and Pauper, within treatments **CTR** and **ITR** respectively. Prince-identity only has a significant impact on number of sliders solved within treatment **ITR**. Specifically, the coefficients *Prince*, *Prince*Medium* and *Prince*High* show significant differences in the average number of sliders solved by Princes and Paupers at every endowment level (see panel (ii), specification 1). The constant term (9 sliders) is the average performance by Paupers with a low **ITR** endowment. Princes solve 5 sliders more than Paupers when they receive the same low **ITR** endowment (i.e. 14 sliders on average). In **ITR**, Princes with a high endowment solve nearly 6 sliders less than those with a low endowment (i.e. 8 sliders on average). These effects are robust to race and gender (see panel (ii), specification 2).

Earlier, a case was presented for the hypothesis that being matched with a low or high performing parent-player through an inherited endowment triggers an identity effect for these individuals by linking initial good or bad fortunes with an inherited relative status. Note that being a Prince or a Pauper does not appear to make a difference to task performance in the **CTR**. The framing of **CTR** is identity-neutral (in that it does not prime participants to any aspect of their identity) because good or bad fortune is attributed to pure luck, not the actions of a person. This result supports the case that it is the experimental framing in **ITR** that triggers an otherwise non-salient Prince-identity.

5 General discussion

This section supplements the above analysis by reflecting on post-session questions that participants responded to in the lab, in order to understand how the framing of endowments was perceived. Limitations of the experiment are then addressed. Recommendations are made for extensions to the present experimental design and for future research.

5.1 Did the experimental framing work?

For an indication of how the lottery- and inheritance-framed endowments were interpreted by participants, several post-session questions were qualitatively analyzed. For example, "How did you feel when you found out your endowment?". Participants could check the box(es) that best explained how they felt, and additional space was provided to state any other emotion that was not on the list. In both the **CTR** and **ITR** *low*-endowment groups, 60% reported to have been "Disappointed". Very few individuals in the two low-endowment conditions reported that they felt "Indifferent" (less than 6 percent) which suggests that being allocated a zero endowment tends to elicit negative emotions. Besides disappointment, subjects reported feeling angry, frustrated, treated unfairly, and sad. Interestingly, when the low endowment was framed as a lottery, only 16 percent of the group reported that they felt "Treated unfairly" but this response increased to 22 percent if the low endowment was framed as an inheritance. This suggests that framing in the experiment worked to the extent that being dealt a bad hand felt more unfair to subjects when it was framed as an inheritance and linked to another person, as opposed when it was framed as a random lottery. As one might expect, the emotional response to receiving a high endowment was overwhelmingly positive, regardless of framing. Participants typically reported feeling elated, happy and pleased.

5.2 Limitations of the experiment

Next, the specific limitations of the experiment are considered. One limitation concerns the sample, which consists of university students. Students are a common and convenient pool of research participants in academic studies, yet it is argued that they may limit the internal and external validity of the findings through being an unrepresentative segment of the broader population. This is arguably a problem of causal inference. In contrast to this common claim, Druckman and Kam (2009) contend that student participants do not pose an inherent problem for external validity and use simulations to show that the student sample is only a problem when the size of the treatment effect depends on a trait on which the sample has almost no variance. The present experimental sample contains sufficient variation in subjects that report the expectation of inheriting wealth from their parents. However, it is argued that university students in South Africa are more likely to be financially better off than the majority of the population – a selection problem – so the study is not likely to capture the behaviour of the poorest particularly well. The availability of financial aid addresses this problem to an extent: the sample includes individuals on financial aid. Nevertheless, the sample is clearly limited to individuals engaging in tertiary education at the university level.

A second limitation of the experiment is that the results may be sensitive to the wording of the instructions. This is worth considering since the treatment uses experimental framing of random starting endowments to elicit changes in behaviour. Simply changing one word in the instructions to weakly prime

individuals is enough to elicit a change in behaviour (Burnham *et al.*, 2000). In the present experiment, when the **ITR** makes the notion of inheriting status and wealth salient, the data generating process may be expected to differ by whether an individual expects to inherit wealth from their parents; augmenting the effect of the intervention. Given the South African apartheid legacy where class and status were principally determined by race, it would be surprising if race were not linked to inherited-wealth status in the experiment, as well as to the expectation of inheriting wealth from one's actual parents.

It is posited that a likely explanation of the race gap is an identity effect triggered by experimental-framing in the Inherit group, where endowments of wealth are linked to relative status. The lottery-frame is neutral in the sense that it does not cue participants to an aspect of their identity. Thus, the lottery-frame condition would not be expected to trigger an identity effect since the random endowments in this treatment are presented as the result of pure luck. An argument against this is the possibility that one group identifies as being more "unlucky in life", making the lottery-frame non-neutral in terms of activating identity effects. This would lead to low/high endowments given by chance to depress/encourage the participant lowering/lifting effort. Though the results do not suggest this, an additional control group without endowments is needed to refute it and show that there is no race gap in number of sliders solved under piece-rate incentives only. The extent to which the race gap is due to Blacks or Non-Blacks is also beyond the scope of the present experiment.

It is acknowledged that the results are quite speculative. This limitation requires the support of future, improved research. In the results it was found that differential responses to inheriting a low endowment by Blacks and Non-Blacks explains the race gap in number of sliders solved. A part of the gap is due to Non-Blacks performing better when assigned a low inheritance-framed endowment as opposed to a low lottery-framed endowment. It was speculated that this relates to the cognitive dissonance literature that predicts that individuals invest more in status seeking (e.g. solving more sliders) when their desire for self-esteem is not met by their lack of social rank (e.g. inheriting a low status in the experiment) (Oxoby, 2003). The other part of the race gap is due to lower relative performance by Blacks when they inherit a low endowment in the lab. This observation was suggestive of the stereotype threat literature, which holds that situations that trigger an identity stereotyped as intellectually inferior can undermine a person's cognitive performance (Hoff and Pandey, 2014). The apartheid legacy of social class largely determined by race (where Blacks suffered the greatest discrimination) arguably creates the foundation for such a stereotyped threat for Black participants. Though the statistical results are suggestive, definitive conclusions cannot be drawn about what is driving the differential behaviour by race.

5.3 Recommendations for future research

The results of the present experiment would clearly benefit from replication. The case was made that the difference in average number of sliders solved by

Black and Non-Black individuals could be attributed to experimental-framing in the inheritance treatment. An important extension to the current experimental design would be to have an additional control condition with no starting endowments. This is necessary in order to establish that there is no race gap in number of sliders solved under piece-rate incentives only. While no gender differential was observed by Gill and Prowse (2012) it would be valuable to replicate this result in South Africa and other developing countries. In the face of limited research funds that restrict sample size, it is recommended to choose two distinct endowment levels only. That is, Low and High. The medium category arguably adds little valuable information to the design and it would be better to increase the sample size of the remaining two endowment categories to achieve greater statistical power.

The experimentally-framed inherited status is quite light as a treatment for intergenerational relative status as there is only one generation of children on which to examine its effects, and there were no explicit legacy effects articulated in the instructions. This means that there were no consequences for the child in terms of the relative status that they themselves could pass onto a subsequent generation of players. The introduction of explicit legacy effects to the inheritance-framed condition is recommended, as this intergenerational link may strengthen the treatment.

Many studies which analyze identity effects measure performance or cooperation in groups. Relative status experiments that involve tournaments, prisoners' dilemma or collective goods games rather than individual level tasks may prompt individuals to think about their inherited-wealth identity to a greater extent, since relative status is meaningful only if one compares oneself to others.

6 Conclusion

This experiment was designed in response to the gap in the literature concerning the behavioural impact of inherited-wealth status on task performance. In particular, it is concerned with the interaction between framed inherited status in the lab and real intergenerational wealth status outside the lab. Below, three significant effects on individual task performance are summarized. The paper ends by considering the study's relevance.

1. **Inheritance-framed endowments trigger an unexpected race gap in task performance, in favour of Non-Black participants.** Since there was no significant difference in **CTR**, it is inferred that in identity neutral situations Blacks and Non-Blacks are equally productive. It is posited that the inheritance frame has affected behaviour through activating latent identities. On average, given treatment frame and endowment level, Black participants perform worse than Non-Black participants. The race gap between Blacks and Non-Blacks can be attributed to differential behavioural responses to inheriting a low endowment.[21] A part of the race

[21] Where the rough race category *Non-Black* contains all self-reported White, Coloured and

gap is due to Non-Blacks performing relatively better when assigned a low endowment framed as an inheritance, as opposed to a lottery. The other part of the race gap is due to relatively lower performance by Blacks when they inherit a low endowment, versus a low lottery-framed endowment. In the present experiment, Blacks are almost half as likely to expect to inherit wealth from their (actual) parents than Non-Blacks. This motivates performing separate investigations of relative status effects for subjects who expect to inherit wealth (which we call *Princes*) and those who do not have this expectation (which we call *Paupers*). These terms are borrowed from Mark Twain's (1881) children's classic *The Prince and the Pauper*.

2. **Low inherited-wealth status in the lab leads to more sliders solved by Princes, but high inherited-wealth status leads to fewer sliders solved by Princes.** The results show significant differences in performance after controlling for endowment (using the lottery-framed endowments to isolate relative status from its associated wealth level). It is posited that the inheritance-frame activates an otherwise non-salient identity. Namely, whether one expects to inherit wealth. In the **ITR**, Princes that inherit a high endowment solve 5 sliders less than Princes that inherit a low endowment. The drop in Princes' performance is attributed to an entitlement effect, since high relative status is an indicator of dominance (Hoff and Pandey, 2014). In this case, a high-status Prince may feel less of a need to prove him (or her) self. No robust significant behavioural impact of status on Paupers is found but it is interesting that the direction of the effects is the opposite of Princes.

3. **Inheritance-frame triggers productivity gap between Princes and Paupers. Prince-identity has no behavioural impact on task performance in lottery-frame.** Prince-identity is non-salient in the **CTR** by design. Since the expectation of wealth makes no difference to performance the **CTR**, it is inferred that in the identity neutral context Princes and Paupers are equally productive. Demonstrating that Prince/Pauper-status is balanced across treatments strengthens the case that the inheritance frame activates an identity effect on Princes' task performance.

This work contributes to the academic literature in that it takes us from the well-developed discussion of the motivations for leaving bequests to begin to understand what the individual consequences are for descendants' behaviour in the labour market. The results of the present experiment are consistent with behavioural and experimental evidence indicating that manipulating framing and relative status in the lab has a significant impact on individual behaviour (Hoff and Pandey, 2014; Benjamin, Choi and Strickland, 2010; Guinote, 2007; Burnham, McCabe and Smith, 2000). In particular, inheritance-framed endow-

Indian individuals. See the Appendix for a detailed explanation of the motivation of grouping by Black and Non-Black.

ments of wealth appear to trigger significant identity effects for *Princes* – those who expect to inherit wealth from their actual parents.

More generally, the experiment contributes to the developing literature on the relationship between inherited-wealth status and effort provision in the labour market. This relationship is of interest beyond the lab the context of continuing national and global concern about intergenerational inequality. Inequality, and differences cultural and class backgrounds may be expected to dominate behavioural differences in South African workplaces and classrooms. This is suggested by lingering racial prejudice and patriarchal attitudes in the labour market and educational institutions. However, this experiment supports the behavioural economics literature that posits that individuals are highly susceptible to framing in ways that augment or mitigate differences in background. This phenomenon occurs even in the brief minutes spent in the artificially constructed context of the labouratory. The implications are profound for the manner in which workplace hierarchies are framed/constructed, and for South African educational institutions, in which the issue of 'decolonizing' education is currently being explored.

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Table 1: Experimental sessions

Session number	Date	Treatment	Endowment group			Total number of subjects
			Low	Medium	High	
1	05/03/16	Lottery	2	3	3	8
2	05/04/16	Lottery	4	4	3	11
3	05/04/16	Lottery	4	4	5	13
4	05/04/16	Lottery	2	3	2	7
5	05/04/16	Lottery	4	4	4	12
6	05/06/16	Inherit	4	4	4	12
7	05/06/16	Inherit	4	4	4	12
8	05/09/16	Inherit	3	3	3	9
9	05/09/16	Inherit	3	3	3	9
10	05/09/16	Inherit	3	3	3	9
11	05/10/16	Lottery	3	3	3	9
12	05/11/16	Inherit	3	3	3	9
13	05/11/16	-	-	-	-	-
14	05/11/16	-	-	-	-	-
15	05/11/16	Lottery	3	3	3	9
16	05/11/16	Lottery	2	3	3	8
17	05/12/16	Inherit	3	3	3	9
18	05/13/16	Inherit	2	2	2	6
19	05/13/16	Lottery	4	4	4	12
20	05/13/16	Lottery	3	3	3	9
21	05/16/16	Inherit	2	2	2	6
22	05/16/16	Inherit	2	2	2	6
23	05/16/16	Inherit	5	5	5	15
24	05/17/16	Inherit	2	2	2	6
25	05/17/16	-	-	-	-	-
26	05/18/16	Lottery	4	4	4	12
27	05/18/16	Lottery	5	5	5	15
28	05/18/16	Lottery	5	5	5	15
29	05/18/16	Inherit	5	5	5	15
30	05/18/16	Inherit	5	5	5	15
31	05/19/16	Inherit	5	5	5	15
32	05/20/16	Lottery	5	5	5	15
34	05/20/16	Lottery	4	4	4	12
TOTAL			105	108	107	320

Note: Experimental sessions were all performed in May 2016 on weekdays Monday-Friday. Experiment sessions 13, 14, 25 and 33 were cancelled due to a venue double-booking. Subjects in these sessions were invited to sign up for another

Table 2: Individual subject characteristics by treatment (Pooled endowments)

Treatment condition	All (N=296)	(i) Lottery (N=152)	(ii) Inherit (N=144)
Age	20.95	20.56	21.35
Female	0.57	0.58	0.57
Race			
Black	0.57	0.55	0.59
White	0.17	0.18	0.15
Coloured	0.18	0.19	0.18
Indian	0.07	0.07	0.08
Financial aid	0.39	0.42	0.36
Expect to inherit wealth	0.30	0.29	0.31
Private school only	0.30	0.30	0.30
Mother Economically Active	0.62	0.63	0.62
Father Economically Active	0.62	0.61	0.63

Note: Summary means rounded to two decimal places.
The experiment used a rolling recruitment strategy. Participants signed up for an available time slot in the list of experimental sessions. Kruskal Wallis H tests are reported as a balance check for random assignment within each endowment level between control (Lottery) and treatment (Inherit). Significant differences are starred.
* shows p-value<0.1, ** shows p-value<0.05, and *** shows p-value<0.01.

Table 3: Individual subject characteristics by endowment level and treatment group

Endowment level	(i) Low		(i) Medium		(i) High		
Treatment condition	Lottery (N=55)	Inherit (N=50)	Lottery (N=52)	Inherit (N=46)	Lottery (N=50)		Inherit (N=49)
Age	21.06	21.50	20.81	21.43	19.85	*	21.14
Female	0.56	0.60	0.57	0.57	0.60		0.51
Race							
Black	0.58	0.59	0.51	0.65	0.58		0.52
White	0.13	0.15	0.18	0.14	0.23		0.17
Coloured	0.26	0.20	0.16	0.14	0.15		0.20
Indian	0.02	0.07	0.14	0.07	0.04		0.11
Financial aid	0.48	0.33	0.35	0.30	0.44		0.45
Expect to inherit wealth	0.29	0.35	0.31	0.23	0.27		0.33
Private school only	0.25	0.27	0.29	0.40	0.37		0.24
Mother Economically Active	0.63	0.77	0.56	0.54	0.71	*	0.53
Father Economically Active	0.63	0.65	0.63	0.55	0.58		0.67

Note: Summary means rounded to two decimal places. Number of observations for each subgroup in brackets. Kruskal Wallis H tests are reported as a balance check for random assignment within each endowment level between control (Lottery) and treatment (Inherit). Significant differences are starred. * shows p-value<0.1, ** shows p-value<0.05, and *** shows p-value<0.01.

Table 4: Summary statistics of slider task performance by treatment and endowment level

Treatment	*(i) Lottery*			*(ii) Inherit*			Kruskal-Wallis	p-value
Dependent variable: Sliders solved	N	Mean	Std. dev	N	Mean	Std. dev	Chi-squared	
Endowment								
Low	55	11.27	4.31	50	12.12	5.00	2.46	
Medium	56	12.09	4.60	51	12.78	5.80	0.13	
High	57	11.83	5.01	51	12.96	5.00	0.85	

Note: Values rounded to two decimal places. Kruskal Wallis equality of populations rank-tests are reported.

Significant differences are starred. * shows p-value<0.1, ** shows p-value<0.05 and *** shows p-value<0.01.

Kruskal-Wallis H tests were also run within the Lottery (control) and Inherit treatment groups to test for significant effects on performance of Low, Medium, High endowment within treatment condition. No significant differences were found.

Table 5: Inherited-wealth status effects on task performance

Dependent variable: Effort (number of sliders solved)	(1)	(2)
Treatment effects		
Inherit	0.445	0.153
	(1.135)	(1.138)
Medium	0.651	0.347
	(1.040)	(1.093)
High	-0.556	-0.675
	(1.038)	(1.131)
Inherit*Medium	0.0478	0.941
	(1.640)	(1.630)
Inherit*High	0.547	0.261
	(1.621)	(1.704)
Additional controls		
Black	No	-2.987***
		(0.683)
Female	No	-2.233***
		(0.710)
Additional controls*	Yes	Yes
Constant	11.64***	15.04***
	(0.677)	(0.883)
Observations	218	194
R-squared	0.087	0.220

Note: Robust standard errors in parentheses.

Significant differences are starred. *** p<0.01, ** p<0.05, * p<0.1

*Additional control for participation in concurrent slider task experiment.

Table 6: Subject characteristics by race and gender

	(i) Race			(ii) Gender		
	Black		Non-black	Female		Male
Subject characteristics						
Age	21.03		20.91	20.42	***	21.81
On financial aid	0.42		0.36	0.40		0.39
Expect to inherit wealth	0.22	***	0.40	0.28		0.33
Private school only	0.27		0.33	0.32		0.27
Mother EA	0.64		0.72	0.71		0.64
Father EA	0.69	***	0.86	0.75		0.84
Average number of sliders	11.07	***	13.88	11.18	***	13.52
Inheritance-frame						
Low	9.00	***	14.58	12.25		12.13
Medium	11.17		16.80	10.42		13.13
High	10.62		13.50	11.67		12.4
Lottery-frame						
Low	11.78		12.14	11.75		12.14
Medium	12.00		14.08	10.95	***	16.31
High	13.38		13.09	10.06	**	15.83

Note: Summary means rounded to two decimal places.

Kruskal Wallis H tests performed by race and by gender. Significant differences are starred.

* shows p-value<0.1, ** shows p-value<0.05 and *** shows p-value<0.01.

Participants who had participated in a concurrent slider task experiment (14 % of sample) were excluded from the summary means and tests because medium endowment category differed by treatment.

Table 7: OLS regression of effort on explanatory variables within (i) Lottery and (ii) Inherit groups

Dependent variable: Effort	*(i) Lottery treatment*			*(ii) Inherit treatment*		
	(1)	(2)	(3)	(1)	(2)	(3)
Endowment						
Medium	0.603	No	0.427	0.564	No	0.996
	(1.021)		(1.064)	(1.254)		(1.131)
High	-0.219	No	-0.123	0.0998	No	-0.386
	(1.054)		(1.115)	(1.258)		(1.214)
Additional controls						
Black	No	-1.441	-1.425	No	-4.788***	-4.777***
		(0.927)	(0.919)		(0.994)	(0.972)
Female	No	-2.676***	-2.646***	No	-2.005**	-2.140**
		(0.923)	(0.935)		(0.984)	(1.036)
Additional controls*	Yes	Yes	Yes	Yes	Yes	Yes
Constant	11.88***	14.79***	14.64***	11.69***	15.75***	15.70***
	(0.687)	(0.851)	(0.941)	(0.978)	(1.094)	(1.226)
Observations	117	103	103	101	91	91
R-squared	0.018	0.125	0.127	0.166	0.365	0.375

Note: Robust standard errors in parentheses. Significant differences are starred. *** p<0.01, ** p<0.05, * p<0.1

* Additional control for participation in a concurrent slider task experiment

Table 8: OLS model of inherited-wealth status effects on task performance for Princes and Paupers

Dependent variable: Sliders solved	*(i) Princes*			*(ii) Paupers*		
	(1)	(2)	(3)	(1)	(2)	(3)
Treatment effects						
Inherit	3.328*	3.543**	4.160**	-2.175	-2.139	-2.343
	(1.706)	(1.552)	(1.631)	(1.531)	(1.571)	(1.792)
Medium	0.924	0.556	1.130	0.662	0.441	0.380
	(2.062)	(1.869)	(1.980)	(1.385)	(1.354)	(1.609)
High	2.223	2.074	3.092	-1.820	-1.748	-3.049*
	(2.060)	(1.974)	(2.236)	(1.323)	(1.387)	(1.580)
Inherit*Medium	-3.323	-2.994	-2.610	2.872	3.113	4.124
	(2.739)	(2.199)	(2.599)	(2.161)	(2.122)	(2.534)
Inherit*High	-5.127*	-5.320**	-6.142**	4.345**	3.532	4.158
	(2.593)	(2.523)	(2.810)	(2.147)	(2.250)	(2.604)
Additional controls						
Black	No	-4.153***	-3.796***	No	-2.250**	-2.160**
		(0.986)	(1.186)		(0.923)	(1.029)
Female	No	-1.505	-1.757	No	-2.306**	-1.785
		(1.035)	(1.111)		(0.904)	(1.089)
Father is economically active	No	No	2.063	No	No	1.872*
			(1.748)			(1.089)
*Additional controls**	Yes	Yes	Yes	Yes	Yes	Yes
Constant	11.89***	14.13***	11.61***	11.74***	14.84***	13.48***
	(1.489)	(1.444)	(2.251)	(0.873)	(1.155)	(1.488)
Observations	62	60	54	140	134	100
R-squared	0.110	0.340	0.325	0.145	0.237	0.294

Note: Robust standard errors reported in parentheses. Significance is starred. *** shows p-value<0.01, ** shows p-value<0.05, and * shows p-value<0.1. Prince=1 if expect to inherit wealth from real parents, 0 otherwise i.e. Pauper.

*Additional control for prior participation in a concurrent UCT economics slider-task experiment.

Figure 1: Schematic representation of a slider

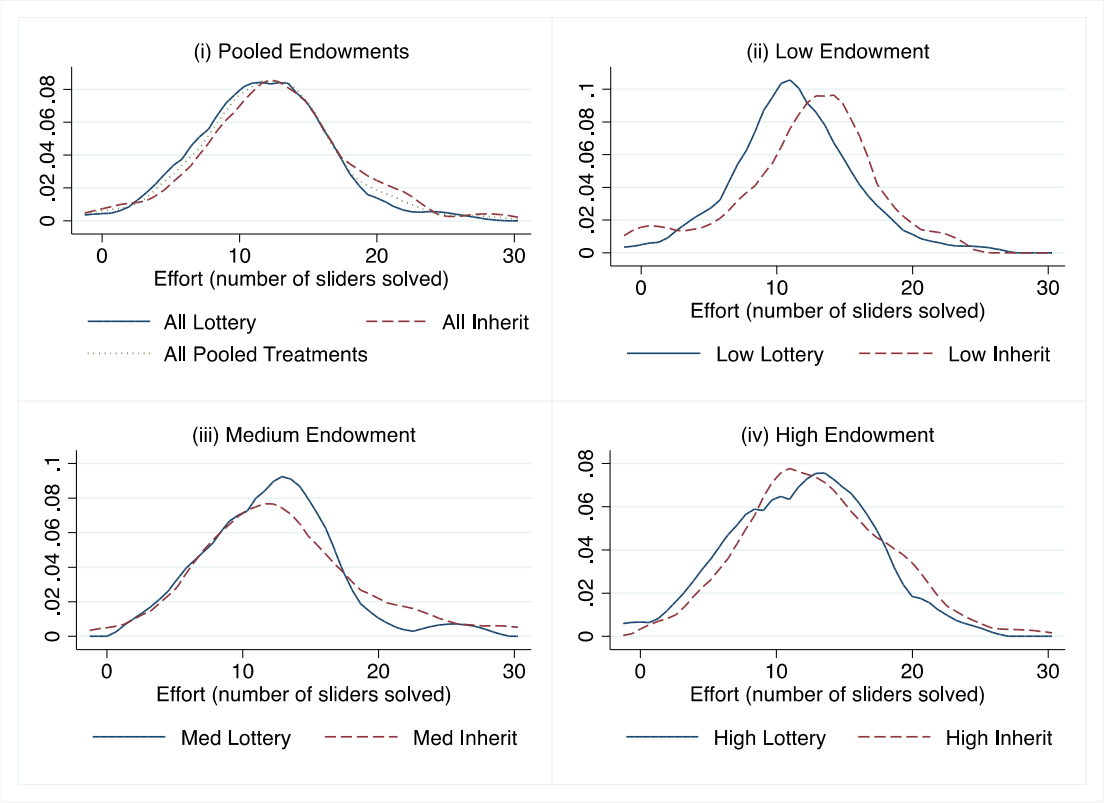
(a) Initial position. (b) Positioned at 50.

(*Source*: Gill and Prowse, 2009)

Figure 2: Screen displaying 48 sliders

(*Source*: own screenshot of slider task, Lottery-frame treatment)

Figure 3: Kernel density plots of effort by treatment condition for different starting endowments



Note: All kernel density plots are Epanechnikov and use default bandwidths in Stata.

Figure 4: Kernel density plots of effort by endowment within lottery and inherit treatment groups

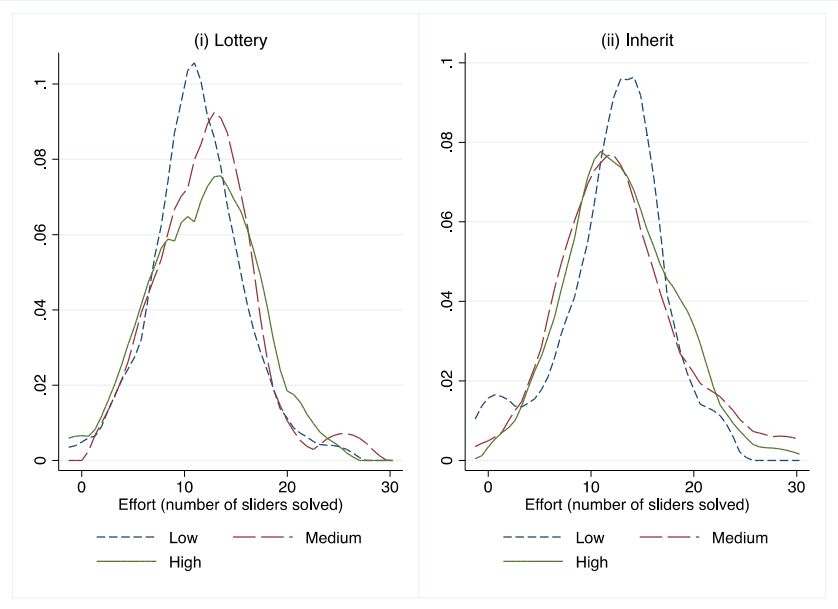


Figure 5: Number of sliders solved by treatment condition for Princes and Paupers

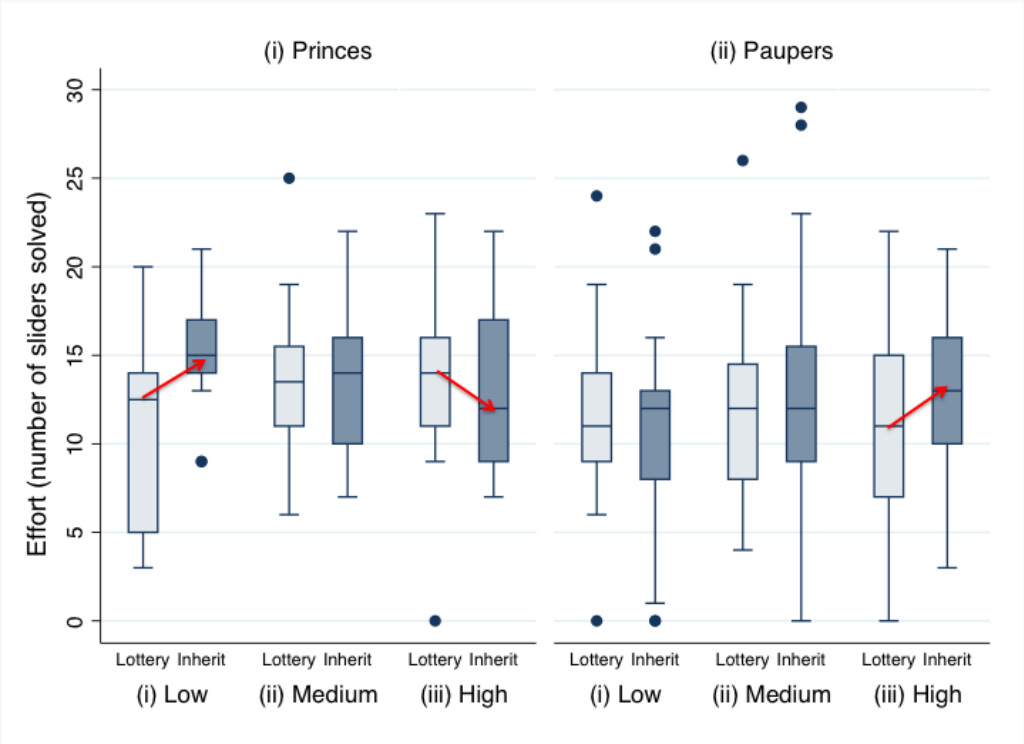


Table 9: OLS regressions of the effect of Prince/Pauper status on number of sliders solved at each endowment level, performed separately for treatment groups CTR and ITR

Dependent variable: Sliders solved	*(i) Lottery*		*(ii) Inherit*	
	(1)	(2)	(1)	(2)
Treatment identity effects				
Prince	-0.245	-1.061	5.481***	4.186***
	(1.705)	(1.717)	(1.597)	(1.392)
Medium	0.330	0.185	3.560**	3.340**
	(1.352)	(1.321)	(1.669)	(1.503)
High	-1.127	-0.981	2.717	1.940
	(1.311)	(1.351)	(1.703)	(1.630)
Prince*Medium	0.667	0.857	-7.392***	-6.724***
	(2.439)	(2.353)	(2.561)	(1.847)
Prince*High	3.362	3.186	-5.950**	-5.516**
	(2.377)	(2.293)	(2.362)	(2.190)
Additional controls				
Black	No	-1.420	No	-4.516***
		(0.980)		(0.982)
Female	No	-2.544***	No	-1.848*
		(0.937)		(1.010)
*Additional controls**	Yes	Yes	Yes	Yes
Constant	12.19***	14.86***	9.213***	13.45***
	(0.861)	(1.086)	(1.328)	(1.624)
Observations	106	103	96	91
R-squared	0.040	0.143	0.252	0.433

Note: Robust standard errors in parentheses. Significant differences are starred. *** p<0.01, ** p<0.05, * p<0.1

Prince=1 if participant expects to inherit wealth from their real parents, 0 otherwise (i.e. Pauper).

Endowment=0 if Low, 1 if Medium, 2 if High.

*Additional control for participation in a concurrent UCT experiment which used the computerised slider task.

Appendix A

A note on race dummy variable *Black*

In the regression analysis I introduce the race dummy variable Black[1] as an additional explanatory variable. In Table A1 we show that grouping participants that self-reported being White, Coloured or Indian into the category Non-Black is motivated by the fact that they perform similarly on the task to each other but not similarly to Black. Table A1 reports Kruskal Wallis H tests of the difference in the number of sliders solved among various race groups in each treatment condition.[2] Significant results indicate that at least one of the race groups is statistically different in the number of sliders solved.

Table A1: Non-parametric tests of equivalence in effort scores among various race groups

Endowment level	Low		Medium		High	
Treatment condition	Lottery	Inherit	Lottery	Inherit	Lottery	Inherit
Kruskal Wallis H test of equality in Effort by race:	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Sample: All race groups						
Incl. Black/Coloured/Indian/White		**	***	**		
Sample: Non-white						
Incl. Black/Coloured/Indian		**	***	*		
Sample: Non-black						
Incl. Coloured/Indian/White			*			

Note: Kruskal Wallis H tests show whether effort differs by race group within each treatment group e.g. (i) Low-Lottery. Significant differences are starred. * shows p<0.10, ** shows p<0.05 and *** shows p<0.01.

The first panel of Table A1 compares effort scores among the four race groups Black, White, Coloured and Indian. We see that effort in the four race groups is not equivalent in the low-Inherit, medium-Lottery and medium-Inherit treatments. It is important to note that Whites were the most advantaged population group under the former apartheid regime, while Blacks suffered the most discrimination. In the second panel of Table A1 we exclude Whites and compare Effort by race among Black, Coloured, Indian and White. Still, there are significant differences at the 5 percent level in the Low-Inherit and Medium-Lottery treatments. However, when I exclude Black and compare only White, Coloured and Indian the significant differences largely evaporate. This motivates for the rough race categories Black and Non-Black used in the regression analysis. Moreover, while a large proportion of participants would have been born after the first democratic elections in 1994, this relative disadvantage is still entrenched to an extent and relevant to the analysis of intergenerational inequality and relative status.

[1] Dummy variable=1 if Black, 0 if White/Indian/Coloured

[2] Note that the Kruskal Wallis H test does not tell us which group is significantly different, only that at least one of them is statistically different.