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YOU'VE EARNED IT:
BINING FIELD AND LAB EXPERIMENTS TO ESTIMATE THE IMPACT OF HUMAN CAPITAL ON SOCIAL PREFERE

Pamela Jakiela
Edward Miguel
Vera L. te Velde

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ABSTRACT

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Pamela Jakiela
Department of Economics
Washington University
St, Louis MO
pjakiela@gmail.com

Vera L. te Velde
508-1 Evans Hall, #3880
Dept of Economics, University of California
Berkeley, CA 94720-3880
vtevelde@econ.berkeley.edu

Edward Miguel
Department of Economics
University of California, Berkeley
508-1 Evans Hall #3880
Berkeley, CA 94720
and NBER
emiguel@econ.berkeley.edu

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Pamela Jakiela, Edward Miguel, and Vera L. te Velde*

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Abstract

We combine data from a field experiment and a laboratory experiment to measure the causal impact of human capital on respect for earned property rights, a component of social preferences with important implications for economic growth and development. We find that higher academic achievement reduces the willingness of young Kenyan women to appropriate others' labor income, and shifts players toward a 50-50 split norm in the dictator game. This study demonstrates that education may have long-run impacts on social preferences, norms and institutions beyond the human capital directly produced. It also shows that randomized field experiments can be successfully combined with laboratory experiment data to measure causal impacts on individual values, norms, and preferences which cannot be readily captured in survey data.

1 Introduction

Social scientists have long sought to disentangle the relationship between formal education, cultural modernization, and economic development. In the African context, sociologists have argued that "Western" education is associated with the adoption of modern values including "independence from family and other traditional authority, belief in science and in

*Jakiela: Department of Economics, Washington University in St. Louis, Campus Box 1208, One Brookings Drive, St. Louis, MO 631030-4899, pjakiela@wustl.edu; Miguel: Department of Economics, University of California, 508-1 Evans Hall #3880, Berkeley, CA 94720, emiguel@econ.berkeley.edu; te Velde: Department of Economics, University of California, 508-1 Evans Hall #3880, Berkeley, CA 94720, vtevelde@econ.berkeley.edu. We thank Raymond Fisman, Shachar Kariv, and participants in the Pacific Development Conference 2010 and seminars at UC Berkeley for helpful comments. Francois Gerard provided excellent research assistance.

man's ability to control his fate, and orientation toward the future" (Armer and Youtz 1971, p. 605). Inkeles (1969) constructs an index of individual modernity which aggregates independence from traditional sources of authority, openness to new experiences, belief in science and modern medicine, ambition, punctuality, and civic participation; he finds that educational attainment is the single most powerful predictor of a modern orientation in all six countries he studies.[1] More recently, Barro (1996) has shown that female education is the strongest long-term predictor of democracy, while Mattes and Bratton (2007, p. 199) argue that education builds support for democratic institutions by "diffusing values of freedom, equality, and competition throughout the population." Whether schooling *causes* such changes in cultural values is an open question; it is also possible that those with an innately modern outlook choose to attend school, and the observed correlations result from sample selection. More broadly, though researchers have identified a robust correlation between modern cultural values and industrialization (Inglehart and Baker 2000), the mechanisms through which such cultural changes occur remain obscure.

In this paper, we provide evidence that academic achievement, as measured by the improvement in test scores induced by a primary school assistance program, alters individual values, specifically moral norms governing the appropriation of others' income, as measured in an economic experiment. Thus, we provide cleaner identification of a mechanism of cultural change than has previously been possible.

We combine a field experiment — specifically, the introduction of a scholarship program for girls in a random sample of Kenyan primary schools — with a lab experiment designed to measure respect for earned property rights. In 2001, the Dutch NGO ICS Africa introduced a scholarship competition for sixth grade girls in a random sample of primary schools in Busia District, in western Kenya, called the Girls Scholarship Program (GSP); the program led to improvements of 0.2 standard deviations on standardized academic tests, relative to

[1] See also Inkeles and Smith (1974). More generally, Easterlin (1981) argues that the introduction of mass primary education has preceded industrialization in most developed economies. Goldin and Katz (2008) trace out how the expansion of public education contributed to the economic and social transformation of U.S. society.

schools in the control group (Kremer et al. 2009). Our experimental subject pool comprises girls from the treatment and control schools in the scholarship program. The design allows us to identify the causal impact of academic achievement on social preferences using an instrumental variables approach, since assignment to a school in the scholarship program (treatment group) is unrelated to baseline characteristics such as cognitive ability and family background.[2]

We measure the impact of academic achievement on social preferences in an experimental lab setting which allows us to turn off strategic considerations such as the fear of social sanctions. Economic experiments are a widely used tool for measuring cross-cultural differences in values, norms, and beliefs that are difficult to capture in survey data. In particular, dictator, ultimatum, and trust games have been conducted on every inhabited continent, with subject populations ranging from university students in the United States to hunter-gatherers in Tanzania (cf. Roth et al. 1991, Henrich et al. 2004).[3] Dictator games — in which one player (the "dictator") is provisionally allocated an amount of money, and decides how to divide it between herself and another person (the "receiver") — measure the willingness to share in non-strategic settings, and have been used to measure the strength of egalitarian (or libertarian) ideals underlying perceptions of what constitutes a "fair" distribution of income (cf. Forsythe et al. 1994, Cappelen et al. 2007, Barr et al. 2009).

We employ a variant of the dictator game designed to measure preferences governing the distribution of earned income — specifically, the willingness to appropriate another's earnings. Hoffman et al. (1994) first used earned, rather than windfall, income in dictator games to generate an informal "property right"; they find that enhancing dictators' sense of entitlement via the earnings manipulation decreases generosity.[4] In contrast, our design increases the extent to which the *receiver* in the dictator game has property rights over the

[2]Friedman et al. (2010) use a similar identification strategy to explore the impact of the GSP on political attitudes, knowledge, and behavior.

[3]See Henrich et al. (2010b) for an overview of the ways in which subjects in western university experimental labs are not representative of humanity in general.

[4]Cherry (2001), Cherry et al. (2002), and List and Cherry (2008) conduct similar earnings treatments. Konow (2000) and Cappelen et al. (2007) also explore distributional preferences governing earned income.

budget: dictators in our experiment decide how to divide money earned by the receiver, who was paid a piece rate for completing a repetitive task.[5] Thus, our design intentionally separates the right to determine the final allocation — i.e. control rights, which Grossman and Hart (1986) define as property rights — from the "natural" but informal property rights proposed by Locke (1980[1690]), which result from generating something through one's own labor.[6] Our specific design measures generosity toward those who have increased social surplus through their own effort.[7] The experiment was first proposed by Jakiela (2009), who reports that more educated Kenyan adults are significantly more generous than the rest of the population when deciding how to divide income earned by others, though not in other situations. The novel research design in the current paper, exploiting the random assignment of schools to the GSP treatment and control groups, allows us to determine whether this association is driven by the causal impacts of schooling on social preferences and beliefs about hard work.

Recent evidence suggests that the level of sharing observed in dictator games is strongly associated with the extent of market integration within a community (Henrich et al. 2004, Henrich et al. 2010a), though the underlying causal mechanism is not well understood. At the individual level, Almas et al. (2010) report that the tendency to reward others for hard work emerges during adolescence among Norwegian subjects: fifth graders participating in a dictator game preceded by a period of team production tended to favor egalitarian allocations, while older subjects were more inclined to base their allocation decisions on relative contributions to total output. Both Henrich et al. (2010a) and Almas et al. (2010) suggest that the fairness norms invoked in dictator games are not innate, but emerge over time through cognitive development and socialization. However, neither is able to identify a causal mechanism to explain how and why disparate cultural norms of fairness emerge

[5]Ruffle (1998) uses a similar design.

[6]Building on Locke (1980[1690]), Gintis (2007) models "preinstitutional" property rights as the equilibrium result of the interaction between the endowment effect and possession. Following Fahr and Irlenbusch (2000), we refer to the entitlement effect generated by our design as an "earned property right."

[7]The design is quite similar to a trust game involving real effort rather than investment, except that receivers can only generate payoffs for themselves by "trusting" their labor income to the dictator.

where and when they do.

Ours is one of the first studies to use lab experimental methods to measure the impacts of a field experiment.[8] The project is closely related to recent studies exploiting natural experiments to show how cultural values and norms evolve. Di Tella et al. (2007) demonstrate that the acquisition of formal land titles by squatters leads to the adoption of more market-oriented beliefs. Employing a methodology similar to ours, Fisman et al. (2009) combine a lab experiment with a natural experiment to show that random assignment of Yale law students to first year instructors trained in economics, rather than in law or humanities fields, leads to the adoption of distributional preferences which are both more selfish and more concerned with efficiency. Our results are broadly consistent with both studies, and highlight the extent to which life experiences shape individual preferences.

2 Experimental Design

2.1 The Field Experiment

We exploit exogenous variation in academic achievement induced by a field experiment — the Girl's Scholarship Program (GSP) — in western Kenya in 2001 and 2002 (Kremer et al. 2009). The GSP was an education initiative for sixth grade girls enrolled in primary schools near Busia, Kenya. Sixty-nine area schools were randomly assigned to either the treatment or the control group; in schools assigned to the treatment group, ICS awarded scholarships to girls among the top fifteen percent of performers on a government-administered practice test for the primary school exit exam (the Kenyan Certificate of Primary Education, or KCPE)[9]. Scholarship recipients received an annual cash grant of approximately $12.80

[8]Fearon et al. (2009) use public goods games to measure the impact of a post-conflict community development initiative on social cohesion in Liberian villages. In addition, recent work by Paluck and Green (2009) demonstrates that randomized experiments can be used to demonstrate the efficacy of policies explicitly intended to change cultural norms.

[9]Another randomized experiment was simultaneously conducted in neighboring Teso district (Kremer et al. 2009), but since it is unclear whether the scholarship increased human capital in this district, follow-up surveys were only conducted in the Busia district. For that reason, we only have actual KCPE scores for Busia students, and we focus only on that experiment in this paper.

(1000 Kenyan shillings) and had their school fees paid for the two years after they won the competition; winners were also recognized at a public awards ceremony. ICS administered the competition in both 2001 and 2002, so two cohorts of girls received awards.

Girls in GSP treatment schools had practice exam scores over 0.2 standard deviations higher than those in control schools, and we show that they ultimately scored higher on the actual KCPE exam. As a result, assignment to a GSP treatment school is an instrument for academic achievement as measured by KCPE performance. Performance on the KCPE is a particularly salient measure of academic success, since it determines whether or not a student will be admitted to a government secondary school.[10] Though only girls scoring near the top of the distribution were eligible for scholarships, the GSP program led to test score improvements at all performance levels, and among boys (who were ineligible for scholarships). The program also led to increases in teacher attendance, which may partially explain the diffusion of benefits (Kremer et al. 2009).

Between 2005 and 2008, an extensive follow-up survey was administered to 1,864 girls from GSP treatment and control schools in Busia District. The GSP Survey sample includes all girls in the GSP cohorts who could be located at the time of the follow-up survey. The effective tracking rate is 80 percent, and attrition from the survey does not differ substantially between the GSP treatment and control groups (Friedman et al. 2010).

2.2 The Lab Experiment

We conduct a lab experiment to measure respect for earned property rights among girls in the GSP treatment and control groups to test whether academic achievement alters individuals' social preferences. Our experiment is a variant of the dictator game, in which one player divides a fixed budget between herself and another player.[11] We conduct an "effort-taking" game in which dictators divide money earned by other players within the

[10] Ozier (2010) reports that scoring above the mean on the KCPE increases the probability of completing secondary school by 20 percentage points.

[11] The dictator game was first proposed by Forsythe et al. (1994). Camerer (2003) summarizes the use of the dictator game in experimental economics.

experiment.[12] Hoffman et al. (1994), Cherry (2001), Cherry et al. (2002), and List and Cherry (2008) conduct dictator games involving earned income; these authors find that dictators are less generous with their own earnings than with windfall income. Jakiela (2009) conducts standard dictator games over both earned and unearned income and taking variants with rural villagers in western Kenya. She finds that Kenyan subjects who have completed some secondary school are significantly more generous than other Kenyan subjects in contexts where effort by other players determines the size of the pie, though not in other contexts. In other words, more educated subjects appear more inclined to reward effort by others.[13]

In the present study, we conduct a real effort "taking" dictator game designed to measure respect for earned property rights. Players were randomly assigned to one of two rooms, and each was matched with a partner in the other room. Partners' identities were not revealed to subjects during or after the experiment. Players performed a task for ten minutes, and were paid a piece rate based on their level of production. Each player's anonymous partner then decided how to divide the players' earning between the two of them. Thus, each dictator divided a budget that was earned by her partner.

In our execution of the experiment, instructions were presented orally, after which all participants briefly practiced the piece rate task. We selected an activity which could be easily understood by all subjects, regardless of educational attainment, and which would allow players to increase their output by exerting greater effort up to some maximum feasible level: subjects earned money by clicking a handheld tally counter and they were

[12]The "effort-taking" dictator game treatment was proposed by Jakiela (2009), and built on the "taking games" employed by Greig (2006). It is similar to the design used by Ruffle (1998), who awarded dictators a large (small) budget if the recipient did (or did not) perform well enough on a general knowledge quiz. Bardsley (2008) and List (2007) conduct related variants of the dictator game which allow for both giving and taking. We also conducted the three other variants of the dictator game proposed by Jakiela (2009), but because these are less directly related to respect for earned property rights, and because our instrumental variable is not valid within the subject pools from those games, we focus solely on the effort-taking variant in this paper.

[13]She also reports that Kenyan villagers are, on average, less generous with their own earned income than with windfall income, but are not more generous with others (in taking games) who have earned income rather than receiving an unearned windfall; moreover, this pattern contrasts with the behavior of subjects in a standard university experimental lab in the United States.

paid based on the number of times they clicked within ten minutes.[14] After practicing the task for two minutes, every subject decided how she would play the dictator game using the strategy method: each subject recorded her allocation decisions in a booklet which listed all the feasible budgets which could be earned by her partner. Subjects then had ten minutes in which to earn money by clicking the tally counter. Subjects' accumulated 30 Kenyan shillings (approximately $0.375) for every 200 times they clicked; this money was subsequently divided between each subject and her partner according to the decision rule the partner had chosen. Following the experiment, each subject filled out a short questionnaire, and then received their payment in private immediately before departing.

2.3 Experimental Subjects

We recruited girls from the GSP treatment and control groups to participate in the effort-taking dictator game. Our main sample includes data on 101 subjects who report KCPE scores in the GSP Follow-up Survey. We did not attempt to recruit a representative sample of GSP Survey respondents since those who had moved out of the area were unlikely to return just to participate in our experiment; instead, we worked with local village officials to compile a list of girls who had not permanently migrated out of their home district.[15] Moreover, since our measure of academic achievement is only available for girls who completed eighth grade and took the KCPE exit exam, only these individuals are included in our sample. We choose to focus KCPE score, rather than educational attainment, since the latter is censored: 72 of our 101 subjects are still in school. Random assignment to a GSP treatment school is associated with an additional 0.358 years of schooling, on average, but the impact is not statistically significant (p-value 0.211). Moreover, test scores are arguably

[14] In contrast to many "real effort" experiments, we opted for a non-cognitive task so that output would reveal minimal information about education or innate intelligence. The task was inspired by Ariely et al. (2009), but adapted to a non-computerized environment. Other non-cognitive tasks which have been used in experimental settings include stuffing envelopes (Konow 2000, Falk and Ichino 2006) and cracking walnuts (Fahr and Irlenbusch 2000).

[15] Friedman et al. (2010) find no evidence that the GSP increased the probability of migrating out of one's home district.

more relevant as an indicator of quality, rather than quantity of education: Barro (2001) and Hanushek and Kimko (2000) both find that test scores on internationally comparable exams are more predictive of future growth rates than years of schooling.

Table 1 compares our subject pool to the sub-sample of GSP Survey respondents who ever took the KCPE exam. While our sample is not representative of the overall GSP Survey sample, it is broadly representative of the proportion of the larger GSP Survey sample who took the KCPE exam. Although no characteristics are statistically significant at 95% confidence, our subjects are somewhat less likely to come from a GSP treatment school (p-value 0.056) and are about three months younger (p-value 0.090) than other GSP respondents who completed the KCPE exam (Table 1). However, there are no significant differences between our sample and other respondents who took the KCPE in terms of educational attainment, household assets, parents' education, or cognitive ability. Thus, we believe our sample is broadly representative of the sub-population that completed eighth grade and took the exit exam.

Table 2 compares the GSP treatment and control groups within our sample in terms of baseline characteristics before the GSP was implemented. Those in the GSP treatment group are not significantly different from the control group in terms of age or parents' education. Given the randomized design and the absence of differences between the treatment and control groups at baseline, behavior within the experiment can be attributed to the impact of the GSP program, and the gains in academic performance it generated, on individual social preferences.

3 Results

Our main sample includes data from 101 subjects, each of whom made thirty allocation decisions. On average, subjects allocated their partners 32.9 percent of the budget and retained 67.1 for themselves (Table 3). This mean level of generosity is higher than in most standard dictator games (Camerer 2003), which is to be expected given the "taking"

context. The distribution has modes at 0 and 50 percent. 5 percent of subjects took the entire budget for themselves, while 13.7 percent split the money evenly and an additional 14.9 percent allocated more than half the money to their partners. Subjects with some secondary schooling allocated their partners slightly more than those who did not (33.6 versus 31.4 percent of the budget, p-value 0.0226, results not shown). There are clear differences between the GSP treatment and control groups in terms of behavior within the experiment. The two groups are equally likely to keep everything for themselves, but subjects drawn from the GSP treatment group are substantially more likely to divide the budget evenly (19.2 percent of subjects versus 9.3 percent) or to allocate their partners more than half the budget (16.8 percent versus 13.3 percent). This is our first piece of evidence that the GSP program impacted individual social preferences.

Our main analysis measures the causal impact of academic performance on social preferences, measured by sharing within the dictator game, using random assignment to the GSP treatment group as an instrument for the KCPE score (Table 4). Our key outcome variable is the share of the total budget that the dictator allocates to her partner, which we term the "partner share." We first report linear IV specifications (Panel A, Columns 1–3), reduced form OLS specifications (Panel B, Columns 1–3), and the IV first stage (Panel C, Columns 1–3). The IV estimates indicate that a one standard deviation increase in a student's KCPE score is associated with a large and statistically significant increase in partner share. Without any regression controls, the coefficient on instrumented KCPE score is 10.6, and is significant at 90 percent confidence. After adding controls for age, ethnicity, and session-room fixed effects, the coefficient remains almost unchanged at to 10.3 and the confidence level increases to 95 percent (Table 4, Panel A, Columns 1–3).[16] Compared to an average partner share of 32.9 percent of the budget, this is a large effect. This corresponds to an approximately 6 percentage point average GSP treatment effect

[16]Age controls include both age in 2008 (normalized) and an indicator for being in the first GSP cohort. Studies by Fehr et al. (2008), Almas et al. (2010), Bekkers (2007), and Fowler (2006) suggest that age is an important predictor of altruistic behaviors. Ethnicity controls are indicators for being a member of a minority ethnic group (Teso or Luo) and for belonging to a local minority subgroup of the dominant Luhya ethnic group.

shown in the reduced form specifications (Panel B, Columns 1–3).

Panel C shows that the F-statistic in the first stage is between 5.3 and 6.3 depending on the controls, and that random assignment to the GSP program increases subsequent KCPE scores by an average of 0.6 to 0.7 standard deviations within our sample.[17] Though our first stage F-statistics are below the rule of thumb proposed in Staiger and Stock (1997), the coefficient of interest is median-unbiased in the just-identified case (Angrist and Pischke 2009); nonetheless, hypothesis tests may be incorrectly sized (Stock and Yogo 2002, Dufour 1997). Anderson and Rubin (1949) provides a statistic that produces confidence intervals of the correct size in the presence of weak instruments. These confidence regions are asymmetric and potentially disjoint or unbounded, but the AR statistic allows us to verify that our results are not dependent on inappropriately small Wald standard errors. With no controls or with age and ethnicity controls, the coefficient on the endogenous regressor KCPE score is borderline significant under the AR χ^2 test with a p-value of 6.4 and 6.3% respectively, and with additional room fixed effects, it is highly significant with a p-value of 0.3%. The 95% AR confidence intervals are, respectively, (-0.90,48.45), (-0.71,31.40), and (3.56,42.83). Although these barely include 0 in the first two cases, overall the AR test merely shows that we can't reject even larger effects, as the asymmetric confidence intervals are skewed upwards compared to the standard confidence intervals. This strongly suggests that our result is not a spurious consequence of a weak instrument.

Figure 1 shows our main result graphically via non-parametric, locally-weighted Fan regressions: the partner share function for participants in the GSP treatment group lies almost entirely above the partner share function for those in the control group.[18]

We further explore the impact of academic achievement on preferences for sharing by estimated IV probit specifications where the outcome variable is an indicator for splitting the budget exactly evenly (Table 4, Panel A, columns 4-6). In all specifications, instru-

[17]This GSP treatment effect on test scores is larger than the roughly 0.4 standard deviations effect reported in Friedman (2010) for the full GSP Follow-up Survey sample. Sampling variation is a likely explanation for the discrepancy, given our limited subsample of 101 lab subjects.

[18]Following Deaton (1997), we choose a reasonable bandwith by trial and error, since the figure is for illustrative purposes only.

mented test scores are positively and statistically significantly associated with a tendency to divide the budget evenly. Thus, the impact of academic achievement is not simply greater generosity, but a clear tenancy to shift toward an exactly equal distribution of the budget.

4 Discussion

Table 5 shows that un-instrumented academic achievement on the KCPE exam is associated with increased generosity in the effort-taking dictator game (Panel A). However, the coefficient on KCPE score is substantially smaller than in the IV regressions discussed above.[19] It is not surprising that the coefficients are different, since academic outcomes depend on factors such as parental influence or socioeconomic status which may also shape norms and preferences, as discussed in Malmendier and Nagel (2009).

The fact that the OLS coefficient is smaller suggests that some factors which explain academic performance are associated with lower levels of respect for earned property rights, or possibly that the IV approach is helping to address attenuation bias caused by noise in the KCPE achievement test score. A further possibility that we cannot rule out is that the GSP experiment affects social preferences through educational channels other than the test score, with schooling attainment being the leading potential channel, and that the IV estimates are in part capturing effects through these other channels. While this possibility somewhat alters the interpretation on the KCPE coefficient estimates, the hypothesized schooling attainment channel is still consistent with the overall thrust of our argument that boosting human capital affects social preferences. Those readers who believe that schooling attainment is a major channel through which the scholarship program affects social preferences thus might prefer to focus on the reduced form results in Panel B rather than the IV results in Panel A.

[19] A Hausman test rejects the equality of the IV and OLS coefficients with 90 percent confidence (p-value 0.065) when the full set of controls is included in the regressions, as in column 3.

There are several possible channels through which human capital could increase giving in our experiment. First, human capital may directly alter social preferences, as we have argued. In an educational environment where effort is rewarded and the benefits from effort are privately held, one might learn to embrace the values that lead to success in that environment. A related possibility is that success in school is a signal for success later in life, and after observing this signal, students choose self-serving moral codes: those who are capable of high productivity adopt norms that reward high productivity. Either pathway might explain a causal impact of academic achievement on individual beliefs about what constitutes a fair allocation, particularly in settings where individual effort determines income.[20]

Alternatively, people might choose allocations based on their beliefs about the types of individuals they are likely to be matched with: in other words, individuals with different beliefs about the average level of altruism and respect for property rights in the population (or the experimental subject pool) might behave differently in our experiment even if their underlying preferences were the same.[21] If school exposes individuals to a different peer group than exists outside of the academic environment, academic achievement may predict generosity in our experiment because beliefs about other players are different, even if reciprocal social preferences (conditional on beliefs) are the same.

To explore the hypothesis that beliefs, rather than preferences, change with academic experience, we asked participants to report how much they thought the dictator allocated to them at four of the twenty possible budget sizes.[22] Table 5 reports OLS regressions of the average amount a subject believed her partner would allocate her on the KCPE score

[20]It is also possible that *winning* the scholarship contest impacted individual preferences via a channel other than academic achievement, for example, through an increase in generalized reciprocity. To explore this possibility, we estimated our main regression specifications omitting the fifteen subjects who won the scholarship contest. Though sample sizes, and consequently significance levels, are reduced, estimated coefficients are essentially unchanged.

[21]Levine (1998) proposes a model of altruism and spite along these lines.

[22]Beliefs were elicited through survey questions and not in an incentive-compatible manner. However, the average belief reported in the survey is not significantly associated with the average amount a subject allocated to her partner. Moreover, beliefs are substantially higher, on average, than actual allocations, while a theory of cognitive dissonance would predict the opposite.

(Panel B), both with and without controls. Academic achievement is not significantly associated with beliefs in any specification. Moreover, the point estimates are negative: test scores are, if anything, negatively related to beliefs about the prevalence of respect for earned property rights. We are consequently able to rule out the possibility that academic achievement impacts beliefs rather than social preferences.

5 Conclusion

We provide evidence that greater human capital, as captured in academic achievement tests, alters individual values, generating greater respect for earned property rights. This finding demonstrates that formal education has cultural impacts beyond the direct production of human capital, and may have social returns beyond whatever wage gains the human capital generates. Though there is an extensive empirical literature exploring the labor market returns to education in less developed countries (cf. Duflo 2001), relatively few empirical studies have tested the claims of modernization theory — that formal education leads to changes in individual values — with convincing research designs. Such cultural change could benefit society in several ways. First, as individuals become more respectful of property rights and more permissive of earned wealth accumulation, the private returns to entrepreneurship may increase. This may be particularly important in rural villages in Africa, where strong egalitarian traditions often lead to the social sanctioning against households that accumulate wealth (Barr and Stein 2008, Platteau 2000). More speculatively, the expansion of educational opportunities may generate positive spillovers if changes in values facilitate the emergence of market-oriented institutions (Bernard et al. 2010). At the same time, education may have impacts on individual values and beliefs other than those documented here; for example, academic success may change later individual aspirations, and these in turn may influence long-run outcomes (Ray 2006).

Our work complements recent cross-cultural comparisons documenting the correlation between market integration and generosity within dictator games (Henrich et al. 2001,

Henrich et al. 2010a), and contributes to the emerging literature documenting the causal mechanisms underlying changes in individual values (Di Tella et al. 2007, Fisman et al. 2009). From a methodological perspective, we use a novel hybrid approach to demonstrate that lab experiments can be combined with field experiments to measure the direct impact of programs on individual preferences and values. In response to recent calls for a greater focus on understanding why and how (rather than just whether) anti-poverty programs work, we demonstrate that the testing of theoretical models which is so often the focus of lab experiments can fit naturally together with the clean econometric identification generated by randomized trials.

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Table 1: **Summary Statistics: Subjects vs. Rest of GSP Sample**

Lab Experimental Subjects? $(S = 0, 1)$	$S = 0$	$S = 1$	Difference
N	1024	101	
First KCPE score (among those who took exam)	258.276	259.604	-1.328
	(1.392)	(4.430)	(4.643)
Change in test scores during GSP	-0.011	-0.001	-0.011
	(0.026)	(0.076)	(0.081)
Highest grade completed	8.602	8.426	0.176
	(0.028)	(0.127)	(0.130)
Age	20.161	19.901	0.260*
	(0.045)	(0.145)	(0.152)
Ravens matrices score	20.727	21.538	-0.810
	(0.169)	(0.622)	(0.644)
English vocabulary score	9.939	10.089	-0.151
	(0.080)	(0.245)	(0.258)
Swahili vocabulary score	9.478	9.812	-0.334
	(0.081)	(0.254)	(0.267)
Respondent held job in last 12 months	1.881	1.871	0.010
	(0.010)	(0.033)	(0.035)
GSP Treatment Group	0.546	0.446	0.100*
	(0.016)	(0.050)	(0.052)
Father's education	9.786	10.420	-0.634
	(0.133)	(0.395)	(0.417)
Mother's education	7.301	7.263	0.038
	(0.132)	(0.415)	(0.435)
Household size	6.951	6.812	0.139
	(0.088)	(0.283)	(0.297)
Household Assets (1000s of KSh)	27.727	30.095	-2.369
	(0.545)	(1.718)	(1.802)

Note: standard deviations in parentheses in columns 1 and 2, and standard errors in parentheses in column 3. $***$ indicates significance at the 99 percent level; $**$ indicates significance at the 95 percent level; and $*$ indicates significance at the 90 percent level. The number of observations contributing to each number may differ from the pool sizes shown when particular variables are unavailable for some people

Table 2: **Summary Statistics: GSP Treatment vs. Control**

GSP Treatment Group? $(T = 0, 1)$	Both	$T = 0$	$T = 1$	Difference
N	101	56	45	
Age	19.901	19.696	20.156	0.459
	(0.145)	(0.185)	(0.227)	(0.293)
Baseline father's education	11.631	11.469	11.788	0.319
	(0.404)	(0.596)	(0.555)	(0.814)
Baseline mother's education	9.574	9.733	9.419	-0.314
	(0.487)	(0.733)	(0.655)	(0.984)
Baseline practice KCPE score	0.077	-0.003	0.219	0.223
	(0.098)	(0.117)	(0.175)	(0.210)

Note: standard deviations in parentheses in columns 1, 2 and 3, and standard errors in parentheses in column 4. *** indicates significance at the 99 percent level; ** indicates significance at the 95 percent level; and * indicates significance at the 90 percent level. The number of observations contributing to each number may differ from the pool sizes shown when particular variables are unavailable for some people.

Table 3: **Reduced Form GSP Impacts**

GSP Treatment Group? $(T = 0, 1)$	Both	$T = 0$	$T = 1$	Difference
Partner share	32.865	30.029	36.394	6.365***
	(0.462)	(0.606)	(0.695)	(0.922)
Gave nothing	0.050	0.050	0.050	0.000
	(0.005)	(0.007)	(0.007)	(0.010)
Gave exactly half of budget	0.137	0.093	0.192	0.099***
	(0.008)	(0.009)	(0.013)	(0.016)
Gave more than half of budget	0.149	0.133	0.168	0.035**
	(0.008)	(0.010)	(0.012)	(0.016)

Note: standard deviations in parentheses in columns 1, 2 and 3, and standard errors in parentheses in column 4. *** indicates significance at the 99 percent level; ** indicates significance at the 95 percent level; and * indicates significance at the 90 percent level. The number of observations contributing to each number may differ from the pool sizes shown when particular variables are unavailable for some people.

Table 4: **Instrumental Variable Results for Test Scores**

	Dependent Variable: Partner Share			*Dependent Variable: Gave Half*		
	(1)	(2)	(3)	(4)	(5)	(6)
PANEL A: IV REGRESSION						
KCPE Score	10.552*	9.290*	10.322**	0.628***	0.623***	0.505**
	(5.910)	(4.940)	(4.732)	(0.211)	(0.195)	(0.23)
Budget	0.028	0.028	0.028	-0.004*	-0.004*	-0.004**
	(0.026)	(0.026)	(0.026)	(0.002)	(0.002)	(0.002)
Constant	31.973***	33.382***	44.756***	-0.827***	-0.647***	-0.668**
	(1.715)	(3.427)	(3.853)	(0.155)	(0.209)	(0.301)
Observations	2020	2020	2020	2020	2020	2020
PANEL B: REDUCED FORM						
GSP Treatment	6.365*	6.504*	7.189***	0.456***	0.496***	0.387**
	(3.420)	(3.493)	(2.404)	(0.163)	(0.155)	(0.173)
Budget	0.028	0.028	0.028	-0.004**	-0.004**	-0.005**
	(0.027)	(0.027)	(0.027)	(0.002)	(0.002)	(0.002)
Constant	29.137***	27.223***	39.934***	-1.188***	-1.181***	-0.968***
	(2.417)	(4.685)	(3.421)	(0.119)	(0.156)	(0.201)
Observations	2020	2020	2020	2020	2020	2020
R^2	0.024	0.049	0.179	.	.	.
Pseudo R^2	.	.	.	0.029	0.039	0.082
PANEL C: FIRST STAGE. DEPENDENT VARIABLE: KCPE SCORE.						
GSP Treatment	0.603**	0.7**	0.696**	0.603**	0.7**	0.696**
	(0.259)	(0.28)	(0.3)	(0.259)	(0.28)	(0.3)
Constant	-0.269*	-0.663***	-0.467*	-0.269*	-0.663***	-0.467*
	(0.147)	(0.222)	(0.262)	(0.147)	(0.222)	(0.262)
First Stage F-stat	5.423	6.267	5.396	5.423	6.267	5.396
Observations	101	101	101	101	101	101
R^2	0.09	0.262	0.3	0.09	0.262	0.3
Age Controls	No	Yes	Yes	No	Yes	Yes
Ethnicity Controls	No	Yes	Yes	No	Yes	Yes
Session-Rooms FEs	No	No	Yes	No	No	Yes

Note: all errors are robust and clustered by school × GSP cohort (the unit of randomization in the GSP). First stage and reduced form regressions are estimated using OLS, and IV regressions use GMM. Coefficients significantly nonzero at .99 (***), .95 (**) and .90 (*) confidence levels.

Table 5: **Association between text scores and expected and actual partner share**

	(1)	(2)	(3)
Panel A: Dependent Variable: Partner Share			
KCPE Score	3.100**	4.283***	3.380***
	(1.416)	(1.532)	(1.248)
Budget	0.028	0.028	0.028
	(0.027)	(0.027)	(0.027)
Constant	31.973***	31.737***	42.790***
	(1.599)	(3.773)	(3.744)
Observations	2020	2020	2020
R^2	0.023	0.063	0.175
Panel B: Dependent Variable: Expectations			
KCPE Score	-0.744	-1.283	-1.705
	(1.651)	(1.675)	(1.662)
Constant	47.024***	45.235***	46.087***
	(1.233)	(1.951)	(3.550)
Observations	1960	1960	1960
R^2	0.003	0.041	0.103
Age Controls	No	Yes	Yes
Ethnicity Controls	No	Yes	Yes
Rooms FEs	No	No	Yes

All specifications estimated using OLS and robust standard errors clustered by school × GSP cohort, the unit of randomization in the GSP. Coefficients significantly nonzero at .99 (***), .95 (**) and .90 (*) confidence levels.

Figure 1: **Fan regressions of Partner Share on Budget**