NBER WORKING PAPER SERIES

REDUCING CRIME AND VIOLENCE:
EXPERIMENTAL EVIDENCE ON ADULT NONCOGNITIVE INVESTMENTS IN LIBERIA

Christopher Blattman
Julian C. Jamison
Margaret Sheridan

Reducing Crime and Violence: Experimental Evidence on Adult Noncognitive Investments
in Liberia
Christopher Blattman, Julian C. Jamison, and Margaret Sheridan
NBER Working Paper No. 21204
May 2015
JEL No. D03,J22,K42,O12

ABSTRACT

We show self control and self image are malleable in adults, and that investments in them reduce crime
and violence. We recruited criminally-engaged Liberian men and randomized half to eight weeks of
group cognitive behavioral therapy, teaching self control skills and a noncriminal self-image. We also
randomized $200 grants. Cash raised incomes and reduced crime in the short-run but effects dissipated
within a year. Therapy increased self control and noncriminal values, and acts of crime and violence
fell 20--50%. Therapy's impacts lasted at least a year when followed by cash, likely because cash reinforced
behavioral changes via prolonged practice.

Christopher Blattman
School of International and Public Affairs
Columbia University
420 West 118th Street
New York, NY 10027
and NBER
chrisblattman@columbia.edu

Julian C. Jamison
Senior Economist
Office of Research
Consumer Financial Protection Bureau
1700 G Street NW
Washington, DC 20552
julison@gmail.com

Margaret Sheridan
Harvard Medical School
Boston, MA 02215
(857) 218-5220
margaret.sheridan@childrens.harvard.edu

An online appendix is available at:
http://www.nber.org/data-appendix/w21204

1 Introduction

In many countries, poor young men have high rates of violence, crime, and other "antisocial" behaviors. The economic costs are steep. In addition to the direct costs of crime and violence, output suffers from so many unproductive young people. Crime and instability also hinder economic growth by reducing investment, lowering demand in some sectors (e.g. tourism), or allocating resources to security. In fragile states, such men are also targets for mobilization into election intimidation, rioting, and rebellion.[1]

Two of the most common government responses policing and job creation. Both take the person as they are and try to change their incentives or simply incarcerate them (Becker, 1968; Draca and Machin, 2015). This paper investigates an alternative: rehabilitation, or changing behavior by shaping people's underlying skills, identity, and values.

A large literature has shown that a broad set of noncognitive skills, especially self control, strongly predict long-run economic performance and criminal activity (e.g. Borghans et al., 2008; Heckman et al., 2006). These skills respond to investment, especially in childhood (Cunha et al., 2010). They are fostered by family, schools, and communities. There is little evidence, however, on the returns to late-stage noncognitive investments, and so it's unclear whether by adulthood self-investment or interventions can shape noncognitive skills and hence behavior (Heckman and Kautz, 2013; Hill et al., 2011). It's also unclear what specific skills are both important and malleable.

To investigate, we recruited 999 of the highest-risk men in Liberia's capital, generally aged 18 to 35. Most were engaged in part-time theft and drug dealing, and regularly had violent confrontations with each other, community members, and police.

We experimentally ran two interventions. One was an 8-week program of group cognitive behavior therapy (CBT) called the STYL program, for Sustainable Transformation of Youth in Liberia. We assigned offers by lottery. Following the therapy, we held a second lottery for an unconditional grant of $200—about three months wages. The cash was partly a measurement tool, to see if therapy affected economic decisions. The cash was also a treatment, in the sense that it could stimulate legal self-employment.[2] Experimentally, subjects either received therapy, cash, therapy then cash, or neither. To deliver both treatments cost about $530 per person.

CBT is a therapeutic approach used to treat a wide range of harmful beliefs and

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[1] For example, poor urban young men were recently recruited into election violence in Sierra Leone (Christensen and Utas, 2008) and as mercenaries in Cote d'Ivoire (Blattman and Annan, 2014).

[2] Evidence from East Africa suggests that the poor and unemployed are credit-constrained and have high returns to cash (Haushofer and Shapiro, 2013; Blattman et al., 2014, 2015).

behaviors, including depression, anger, and impulsivity. First, it tries to make people aware of and challenge harmful automatic patterns of thinking or behavior. Second, it tries to disrupt these patterns of thinking and to foster better ones by having people practice new skills and behaviors. The STYL therapy itself was designed and implemented by a Liberian non-profit organization, the Network for Empowerment and Progressive Initiatives (NEPI), which has been running versions of the therapy for a decade. In STYL, groups of 20 men were led by NEPI facilitators, who were themselves reformed combatants or criminals who graduated from a previous NEPI therapy.

Within the broad category of "noncognitive skills", STYL focused foremost on self control. By this we mean the tendency to be planful, responsible, and resistant to temptation and impulse. Self control skills are often central components of US programs from preschool to rehabilitation therapy.[3] The curriculum focused on helping men foster skills of planning, goal-setting, being more reflective and deliberate in decision-making, and controlling their emotions and impulses.

The therapy also tried to foster a nonviolent, noncriminal self image and set of values. A premise of STYL was that the men self-identified as outcasts and didn't hold themselves to the standards of mainstream society. The therapy tried to persuade the men that they could change who they were, and how they were perceived. It deliberately walked them through these steps, such as changing their appearance or engaging in normal social interactions. NEPI facilitators also modeled this image change.

The idea that self image and associated preferences are malleable has a central place in criminology (Maruna and Roy, 2007). A psychology and economics literature also supports the idea that self image and associated values influence behavior, and that both can change. This literature treats values as direct utility benefits or penalties from acting in accordance with or against a set of preferences (Bénabou and Tirole, 2004; Almlund et al., 2011). Akerlof and Kranton (2000) argue that these values are tied to a person's self image, or perceived social category, and that to some extent people can change their social category and with it values that reward and penalize certain behaviors.

There are striking parallels between STYL and socialization into militaries, street culture, gangs and armed groups. Such groups use similar techniques (appearance change, practice, modeling) to shape young men's self-image and behavior (Vigil, 2003; Wood, 2008; Maruna and Roy, 2007). NEPI designed STYL to reverse this process.

We surveyed the men beforehand, a few weeks after the interventions, and finally

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[3]e.g. Gottfredson and Hirschi, 1990; Borghans et al., 2008. As an example of an intervention, the famous Perry Preschool Program emphasized the ability of young children to plan tasks, execute their plans, and review their work in social groups (Almlund et al., 2011).

a year later. Most men had no fixed address, phone, or even name, and they moved around the country or were in and out of prison. Despite this mobility, we re-interviewed 93%. We rely on self-reported data since (like most poor and fragile states) there are no administrative or arrest records. We did not necessarily trust self-reports, and so we validated behaviors such as drug use and stealing in a subsample.

We approached roughly 1500 high-risk men, and 999 agreed to enter the study. Of those assigned to therapy, nearly all attended at least a day, and two thirds completed it.The higher risk men were the most likely to finish. We estimate simple intent-to-treat effects.

Men who received therapy reduced their antisocial behavior dramatically. Within a few weeks, for instance, drug dealing halved and thefts fell by a third, compared to controls. With therapy alone, these effects diminished after a year. When therapy was followed by cash, however, effects were lasting. For example, a year later, those who received both therapy and cash were 44% less likely to be carrying a weapon, 43% less likely to sell drugs, and reported lower aggression. In the control group, men reported stealing almost once per week on average, and with therapy and cash this fell nearly 40%—equal to 25 crimes per year, per person.

These declines do not seem to be driven by misreporting. On the contrary, validation suggests the control group underreported behaviors such as stealing, and hence the treatment effects slightly underestimate therapy's impacts.

Therapy also led to improvements in self control skills and anticriminal values of a similar magnitude to the antisocial behavior change. With therapy alone, these noncognitive changes diminished after a year. When therapy was followed by cash, however, the effects were lasting. We cannot validate these self-reported skills and values, but we show that treatment effects are similar whether we examine skills and values covered or ignored in the STYL curriculum.

How was cash used? Regardless of therapy, little of the grant was spent on drugs or "wasteful" things. Most funds were invested in business or saved. Cash led to a short-term increase in petty trading and income. After a year, however, these gains disappeared, partly because most men were robbed regularly, irrespective of treatment.

The fact that therapy's effects were strongest and most sustained when followed by cash is one of our more unexpected and important findings. Without a sustained effect of cash on earnings, it seems unlikely that cash raised the opportunity cost of antisocial behavior. Drawing on qualitative interviews and psychological theory, we argue that the brief increase in income and legal employment helped to extend and reinforce the changes

in self control skills and self image. Specifically, for a few months longer than the original intervention, the cash allowed men to project a changed self and to avoid homelessness and stealing. In effect, we believe cash helped the men practice behavior change started by the in-class therapy for a longer period of time.

Altogether, these results suggest that noncognitive skills and values are malleable in adulthood (at least high risk men). This is consistent with studies in the United States (US) that show that adolescent CBT programs in schools and correctional institutes reduce antisocial behavior, at least temporarily.[4] For example, three recent randomized control trials among at-risk Chicago adolescents show that CBT can help adolescents reduce automatic behaviors (such as violent retaliations to a slight) by learning to override "fast" decision-making with conscious, "slow" reflection (Heller et al., 2015). There are parallels to STYL', though STYL targeted a broader array of skills and values.

In addition to testing the interaction of an economic intervention with CBT, this study also addresses several gaps in the literature. While CBT is a well-established approach in the context of child and adolescent antisocial behavior, there is little evidence on late-stage interventions. Most efforts to reduce crime focus on education and employment, with direct noncognitive investments more rare.[5] Moreover, few studies have attempted to measure noncognitive skill and value changes directly, but rather rely on administrative records on school dropout, infractions, or arrests. A final gap is geographic, as there is little non-Western evidence. Understanding how to shift violent behavior in fragile states, where mobilization into armed conflict has fewer barriers, is crucial.

It remains to be seen if STYL is replicable elsewhere, but there are several sources of promise. STYL was adapted from established Western therapies with a strong evidence base. STYL also developed its own facilitators from prior graduates, enhancing scalability. Ideally, future work would not only test generalizability to new contexts, but also address the limitations of this study, including: a reliance on self-reported (albeit validated) data; an absence of direct measures of image change; and no variation in therapeutic length, technique, or focus. The complementarity between economic assistance and therapy also demands more investigation.

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[4]For evidence on children and adolescents, see Heckman and Kautz (2013); Hill et al. (2011). Meta-analyses of adolescent and adult interventions in correctional institutes find that CBT-informed programs that target criminogenic behaviors among the highest-risk men reduce recidivism more than alternate approaches (Andrews et al., 1990; Lipsey, 2009). Heller et al. (2015) highlight some of the weaknesses of this literature, which include small sizes, attrition, and in some instances poor causal identification.

[5]Two large US programs, Job Corps and ChalleNGe, are residential programs for at-risk youth that provide some social and character skills, but mainly focus on remedial training and employment (Schochet et al., 2008; Millenky et al., 2012). The programs that most commonly target noncognitive skills directly are those in correctional institutions (Andrews et al., 1990; Lipsey, 2009).

2   Intervention and experiment

Liberia's capital, Monrovia, is home to a third of the country's 4.3 million people. There are few formal jobs. Most men aged 18 to 35 have limited employment and earn money through a mix of agriculture, casual labor, or petty business. A few turn to crime, which is becoming more violent and commonplace.

From 1989-96 and 1999-2003 two civil wars wracked Liberia. They killed 10% of the population, displaced a majority, and recruited tens of thousands into combat. Since 2003, however, Liberia has been at peace with the help of a United Nations (UN) peacekeeping force. During our study period, 2009-12, the economy was growing 6% per year (Republic of Liberia, 2012). Nonetheless, in 2009, people aged 18 to 35 would have spent 2 to 15 years of their childhood or adolescence under war and political instability, many robbed of the institutions and stability that normally fostered planfulness, emotional stability, and other noncognitive skills.

Marginalized young men are one of the government's main concerns, especially poorly reintegrated ex-combatants and other men involved in drugs and crime. Drug and criminal networks were disorganized, but there was worry that they could consolidate. Another worry was political violence. High-risk men had joined riots in the past, and more serious violence was feared. They were targets for mercenary recruitment into the 2010-11 conflict in Côte d'Ivoire. Before the 2011 elections, there were also worries these men would be mobilized into election violence.

2.1   Recruitment and target population

The study recruited 999 young men aged 18 to 35 in five mixed-income areas of Monrovia, focusing on the homeless, men involved in drugs and crime, and poorly reintegrated ex-combatants. Column 1 of Table 1 describes the sample at baseline. On average the men were 25, had nearly eight years of schooling, earned about $68 in the past month working 49 hours per week (mainly in low skill labor and illicit work), and had $34 informally. 38% were a former member of an armed group.

NEPI recruited study subjects. NEPI had extensive knowledge of these neighborhoods and connections to local leaders, as well as a strong reputation that leaders and high-risk young men could verify (which NEPI often encouraged them to do, to build trust). NEPI solicited recommendations from local leaders, but mainly targeted places or professions with reputations for high-risk young men.[6]   All our data and qualitative observation

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[6]Professions included "car loaders" who have reputations for pickpocketing, or wheelbarrow and mo-

Table 1: Baseline summary statistics and test of balance for select covariates

	Sample	Test of randomization balance			
		Assigned therapy		Assigned cash	
Baseline covariate	Mean	Coeff.	p-value	Coeff.	p-value
	(1)	(2)	(3)	(4)	(5)
Age	25.40	-0.13	0.69	0.06	0.82
Married or living with a partner	0.16	0.00	0.98	-0.02	0.36
# children under 15 in household	2.21	-0.14	0.49	-0.11	0.45
Years of schooling	7.72	-0.13	0.56	0.03	0.92
Has any disabilities	0.08	0.01	0.39	-0.02	0.25
Ex-combatant	0.38	0.01	0.64	0.03	0.34
Monthly cash earnings (USD)	68.30	2.66	0.29	-7.49	0.22
Currently sleeping on the street	0.24	-0.01	0.42	-0.01	0.38
Savings stock (USD)	33.75	-0.53	0.89	-3.31	0.46
Hours/week in illicit activities	13.55	0.65	0.56	-0.26	0.81
Hours/week in agriculture	0.36	0.41	0.02	-0.06	0.79
Hours/week in low-skill wage labor	19.39	-0.83	0.81	0.10	0.97
Hours/week in in low-skill business	11.53	3.59	0.02	1.83	0.14
Hours/week in high-skill work	1.51	0.18	0.67	0.85	0.00
Sells drugs	0.20	0.01	0.49	0.00	0.97
Uses marijuana daily	0.44	0.03	0.32	0.01	0.57
Uses hard drugs daily	0.15	-0.05	0.03	0.03	0.41
Committed theft in past 2 weeks	0.53	0.02	0.68	0.01	0.72
Aggressive and hostile behaviors index, z-score	0.00	-0.05	0.45	0.00	1.00
Conscientiousness index (0-24)	15.33	-0.03	0.62	-0.14	0.26
Patience index (0-6)	4.12	0.11	0.45	-0.05	0.77
Time inconsistency index (0-6)	3.27	-0.18	0.01	0.02	0.74
Risk aversion index (0-3)	1.57	0.06	0.49	0.00	0.97
Executive function (z-score)	0.00	0.02	0.64	0.00	0.96
Cognitive ability (z-score)	0.00	-0.07	0.18	-0.03	0.74
R-squared		0.12		0.05	
p-value on F-statistic on all 58 covariates		0.64		0.90	

Notes: All 58 covariates are reported in Appendix A.1. Column (1) reports the sample mean at baseline. All responses are based on survey questions except for the indices of patience, time inconsistency, and risk aversion, which are based on small-stakes choices made with real sums of money. A small number of missing values are imputed at the median. Columns (2)-(3) and (4)-(5) report the coefficients and p-values from an ordinary least squares regression of an indicator for assignment to treatment on the baseline covariates used in all treatment effects regressions. Block and validator fixed effects are included in the regressions but omitted from this table.

indicates this process identified the highest-risk men.

NEPI approached each target and described the therapy (not the cash), the lottery process, and the surveys. They approached roughly 1500 men, and 999 agreed to speak and enter the sample (we do not have data on those who refused). To avoid recruiting groups of friends and colleagues (i.e. to minimize correlated outcomes and spillovers) NEPI approached just one out of every seven to ten high-risk men they identified.[7]

2.2 Interventions

We designed the programs be low cost, roughly $530 per head for all: $14 for registration, $189 for therapy, $216 for the grant, and $111 for administration costs.

Therapy

CBT is a short-term approach that tries to reduce self-destructive beliefs or behaviors and promote positive ones. It does so in two ways. First, the therapist tries to help the patient become more aware of their automatic thoughts: inaccurate or negative thinking about themselves or others. Shifting automatic thoughts allows them to respond to everyday situations in a more effective way. A central principle of CBT, however, is that sustained changes in behavior or symptoms also comes from actively practicing new behaviors, often starting with simple tasks and, through repetition, positive reinforcement, and gradually increasing the difficulty or complexity of the tasks, changing both behavior and thinking. This practice happens in therapy but also as "homework" (Beck, 2011).

CBT has been studied extensively and validated as a treatment for several of the behaviors targeted by STYL: anger, aggression, criminality, and substance abuse (Saini, 2009; Pearson et al., 2002; Wilson et al., 2005; Del Vecchio and O'Leary, 2004).

Origins and aims STYL grew from of the experiences of NEPI's founders, but as it developed, standard Western CBT curricula were integrated into it as it was shaped via

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torbike parking areas with reputations for drug selling and crime. It is also easy to identify gambling and drug shacks, squatter sites, and hangouts for the homeless. The team sometimes also approached men who were poorly dressed, had longer hair or dreadlocks, or bloodshot eyes. Recruiters attempted to exclude people with serious addictions to hard drugs, or mid-ranking criminals (e.g. bosses of street drug dealers), and men with legal jobs.

[7]We estimate our sample represents 0.6% of all adult males in the neighborhoods, and about 12% of all men aged 18–35 and in the bottom decile of income (Appendix A.2). We traced social networks for first two therapy groups. On average, each subject was casually friendly with 6 of the 43 others. 13 of the 44 reported one close associate in the group.

interactions with international organizations and experts resulting in a firm grounding in research-based psychological theories of change.

The program combined group therapy with one-on-one counseling. Twenty men met in groups three times a week, four hours at a time, led by two NEPI facilitators. On alternate days when groups did not meet, facilitators visited men at home or work to provide advising and encouragement. NEPI offered no compensation except lunch, since men who sacrificed four hours of work could not afford to eat.

As noted earlier, NEPI designed the curriculum and approach to encourage two kinds of change. First, they tried to teach skills of self control: to become more conscientious and persevering, manage their anger and emotions, and reduce impulsivity.[8] While often described as personality traits, such traits evolve over the life cycle and are affected by upbringing and investment, so we follow Heckman and Kautz (2013) in considering them skills of character. This concept of self control has parallels to economic time preferences. In general, the literature is unclear whether character skills are related to time preferences.[9] We measure both and treat the relationship as an empirical question.

Second, NEPI tried to persuade men to change their self image, from outcast to normal society member. The premise of STYL was that the security and respect associated with a mainstream identity were familiar, even attractive, to the men. So were the values associated with a mainstream identity—it was no mystery to the men that crime and drugs were considered "bad". But those norms and values didn't apply to outcasts like them, to whom a main mainstream identity seemed out of reach or a poor fit.

NEPI facilitators tried to persuade the men that this identity was within reach, and that the men should at least try. Partly through exercising skills of self-control, and partly by practice and exposure to new situations, the STYL curriculum walked men through the process of change. The facilitators were an integral part of this intervention, because they modeled the change in skills and values. All were graduates of a prior STYL-like program run by NEPI, and three-quarters were former "hard core" street youth or combatants.

There are parallels to interventions which show that aspirations—forward-looking goals or targets—influence behavior and respond to investment (Bernard et al., 2014). There are also parallels to switching social identity, described by Akerlof and Kranton (2000). Criminologists sometimes refer to this process as "knifing off" from old social rules and

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[8]Note that psychologists also use "self control" to refer to abilities such as executive function (EF) and delay of gratification (DoG), both of which are thought to lead to less impulsive decision-making and influence long-term success (Mischel et al., 1989). Some evidence suggests that EF and DoG are distinct from our character skills and are less malleable (Duckworth and Schulze, 2009). We measured EF and DoG but they were not the focus of the therapy and we did not hypothesize any change.

[9]The limited evidence suggests correlations are positive but low Becker et al. (2012).

behaviors, and associate these changes with significant turning points in life, such as marriage, a move, or a life-threatening experience (Maruna and Roy, 2007). This literature almost always ties successful knifing off to having a new "script" for the future. The STYL program is effectively that script.

STYL curriculum and approach.   The sessions employed a variety of techniques, from lectures and group discussions, to various forms of practice, including: role playing in class, homework that requires practicing tasks, exposure to real situations, and in-class processing of experiences of executing these tasks. Like many CBT programs, these tasks began simply and got more difficult over time.[10]

In the first three weeks, facilitators encouraged men to try to maintain some new, simple behaviors. This included getting a haircut and removing facial hair, wearing shoes and pants instead of sandals and shorts, improving personal hygiene and the cleanliness of their living area, and reducing substance abuse. These simple exercises in goal-setting and self control also helped men start to operate within mainstream social norms.

In the middle weeks, facilitators encouraged men to engage with society in planned and unaccustomed ways, akin to exposure therapy.[11] For instance, homework included reintroducing themselves to their family, joining community sports, and visiting banks, supermarkets, shops, and so forth. Men also studied successful people in their community, and reached out to one as a mentor. Men then processed their attempts as a group. Often homework was independent, but facilitators might accompany the more troubled men.

Men also learned to manage emotion: practicing nonaggressive responses to angry confrontations in class, and recognizing signs of angry reactions and learning to distract or calm oneself (walking away, doing other activities, or breathing techniques).

In the last weeks, facilitators taught planning and goal setting. These lessons included training on breaking down large goals into smaller accomplishable sub-goals, and then creating plans to accomplish them via concrete steps. For example, men would list sub-goals of a plan; these were written on a paper in front of the room, for all to see; the group critiqued them; and plans were rewritten. For homework men would attempt planning in their own lives: how to feed their family the next day; starting a garden; making a savings plan; reconciling with estranged family; or starting a business. These assignments began

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[10]Appendix B.2 describes the curriculum in more detail. The full program manual is available at http://chrisblattman.com/documents/policy/2015.STYL.Program.Manual.pdf.

[11]Therapy for patients with social phobia practice similar engagement (Ponniah and Hollon, 2008). Besides practice, subjects learn that social feedback is less negative than feared. By re-engaging with society, participants tested their negative beliefs about themselves.

easy and got more difficult. This process of goal identification and planning is central to most forms of CBT, especially for disruptive behavior disorders (Langberg et al., 2013).

Unconditional cash transfers

A second organization, Global Communities (GC), ran a cash lottery roughly one week after therapy. Winners received $200 cash. Losers received a consolation prize of $10.[12] There was minimal framing of the grant. Prior to the lottery, subjects were given about 15 minutes of information on how to keep the money safe (e.g. depositing it with a bank) and examples of what they could use it for (e.g. starting a small business or home improvement). But GC explicitly emphasized to subjects that the grant was unconditional and they were free to do what they wished.

2.3 Experimental design

We use a 2×2 factorial experiment, in blocks of roughly 50 men. The experiment proceeded in four steps: First, roughly one week after recruitment and baseline surveys, NEPI held public draws to assign half the men to an offer to enter therapy. Therapy commenced one week after the draw. About 1–2 weeks after therapy, GC announced and held a private draw for $200 grants among the full sample, blocked by assignment to therapy. Finally, a third organization (Innovations for Poverty Action) ran endline surveys 2 and 5 weeks, and then 12 and 13 months, after grants.

The sample were very mistrustful of authority, and we randomized by individual draw rather than computerized assignment to maximize trust, transparency, and staff safety. Men in each block took turns drawing colored chips from an fabric bag.[13]

Balance This resulted in 25% assignment to cash, 25% to cash and therapy, but 28% to therapy only, and 22% to neither (Table 2). The excess therapy assignments is in part chance, and is in part driven by two blocks where excess treatment chips were accidentally used. All regressions include block fixed effects to account for this. Treatment is balanced along covariates. Table 1 reports tests of randomization balance for teach treatment for selected covariates (see Appendix A.1 for all). Of 57 covariates, three (5%) have a

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[12]See Appendix B.3 for implementation details.

[13]The order of selection was deliberately unsystematic but not randomized. The number of chips in the bag generally exceeded the number of draws, partly to avoid a correlation between order of the draw and treatment assignment probabilities, and partly to avoid having late-drawing men receive their status by default. For the cash grant, men were also blocked by initial assignment to therapy (i.e. they attended different draws). See Appendix B.1 for full details.

Table 2: Study sample and treatment assignment by block and phase

	Start date			% recruits assigned to:			
Phase	(MM/YY)	Block (slum)	Sample	Therapy	Cash	Therapy & cash	Neither
1	12/10	Red Light	100	25.0%	25.0%	25.0%	25.0%
2	06/11	Red Light	219	26.9%	25.1%	24.2%	23.7%
	06/11	Central Monrovia	179	31.8%	19.0%	31.8%	17.3%
3	03/12	Clara Town	175	28.6%	27.4%	22.9%	21.1%
	02/12	Logan Town	86	26.7%	29.1%	19.8%	24.4%
	02/12	New Kru Town	240	26.3%	26.7%	23.8%	23.3%
All			999	27.7%	25.1%	24.9%	22.2%

difference with $p < .1$ for therapy, and four (7%) have have a difference with $p < .1$ for cash, and they are jointly not significant.

Compliance Both interventions had high compliance, in part due to the persuasive efforts and credibility of the implementers. Of those assigned to the cash grant, 98% received it. Among men assigned to therapy, 5% attended none, another 5% dropped out within the first 2–3 weeks, and two thirds attended most sessions ($>80\%$). Those who dropped out early had less schooling, lower earnings and assets, and were less likely to abuse substances or steal (Appendix A.3). Thus the highest-risk young men seem more likely to attend over poorer, noncriminal men.

Phased implementation For logistical reasons we recruited, treated, and studied the men in three phases, as seen in Table 2. A pilot phase recruited 100 men, to ensure that the therapy and cash grant caused no harm, to assess statistical power, and to allow us to refine experimental protocols . The pilot showed no indication of harm, and so we scaled to a further 900 with only minor changes to the interventions and protocols in two phases.

3 Conceptual framework

We start by considering the potential effects of therapy and cash in a simple model of occupational choice between legal and criminal work.[14] We develop the formal model in Appendix C and outline the structure and results here. We treat self control skills as a

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[14]It is rooted in models of occupational choice with capital infusions and adapted to illicit behavior, as in Blattman and Annan (2014). It is related to the broad class of economic crime models discussed by Draca and Machin (2015).

dimension of ability, within the production function. In principle, improved self control could also affect time preferences, and we allow for that possibility. Finally, we model a change in self image and values as a preference over crime qua occupation.

This simple introduction of preferences for time and actions follows the structure of the Almlund et al. (2011) model of personality in economics. Typically economic models treat such preferences as fixed, or ignore them. Our aim is merely to outline how exogenous change in noncognitive abilities or preferences affect the comparative statics in an otherwise standard model.

Setup We suppose men can allocate time between leisure l, legal work L^b such as petty business or labor, and illegal occupations L^c such as crime, mercenary work, or election thuggery. We refer to these as "business" and "crime".

We assume crime uses labor alone and pays a wage w, which may be uncertain. This resembles the observed returns to illegal work in Liberia.[15] Crime also carries a punishment f with probability ρ, and this risk increases with the time devoted to crime. Punishment could mean prosecution, mob justice, or social sanctions.

Business uses capital, and yields output $F\left(\theta, L_t^b, K_t\right)$ where θ is individual ability and K_t is capital inputs at time t. Finally, people start with wealth in the form of a riskless asset, a_0. They save or borrow at interest rate r. Self control skills are one element of θ, and output is increasing in θ.

We assume that people value consumption and leisure, but we also allow for the possibility that a person's self image and personal values penalize crime. We use σ to indicate this preference against illegal labor. Thus people have the utility function $U\left(c, l, \sigma L^c\right)$. We put the σ in the utility function to distinguish it from punishments f. This is essentially a consumption value of conforming to one's self-image or identity (Akerlof and Kranton, 2000; Bénabou and Tirole, 2004).[16]

Finally, we allow people to be present-biased in the sense that they have a general inter-temporal discount factor δ but can also be time-inconsistent with an extra factor denoted $\beta < 1$ that multiplies all future periods relative to the present (the standard form of quasi-hyperbolic time preferences).

In this framework, people choose consumption, labor supply in each sector, and the

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[15]Petty crime requires little capital; drug dealers typically work for a "boss" who owns the supply; and those who leave town to work in illicit mining work as "mining boys" for capital-owning "miners" on short-term renewable contracts that pay a daily wage plus a payment tied to output.

[16]We ignore the possibility, proposed by Bénabou and Tirole (2004), that ability is imperfectly known and correlated with perceived self-image.

amount of wealth to invest in business (versus the safe asset) in order to maximize their utility subject to the constraint that consumption plus wealth are equal to total income from business, crime, and the interest on investment.

Occupational choice in the absence of interventions   Where financial markets work well and where people are time consistent ($\beta = 1$), people are at their optimal business scale—that is, they have borrowed (if needed) until the marginal return to capital is equal to r. Of course, the poor are typically credit constrained. In this case poor people are forced to slowly invest in capital over time until they reach the same optimal scale. The young and those who have experienced adverse shocks will be the furthest behind their potential. As a result, crime is more likely to be chosen by men with low business ability θ, the poor and credit constrained, those with low disutility of crime, and the time-inconsistent. People may also choose both crime and business. Credit-constrained people with partial capital for business may still spend some time in crime. Also, risk averse people may do both activities when returns are uncertain.

Impacts of cash   If there are no credit constraints, cash windfalls will not affect occupational choice. But if one is credit constrained, windfalls will be partly invested in business. It will also shift people from crime to business, especially those with high ability. Cash infusions will lead to a smaller increase in business work for time-inconsistent individuals, however, since they will choose to consume more today.

Impacts of therapy   In principle, the therapy could increase σ, increase θ, or β. These channels have some distinguishing predictions. Interventions that increase σ (or the size or probability of punishment) will reduce time devoted to crime, but will have no effect on returns to business. Interventions that increase business ability θ will not only induce more time and investment in business, but also reduce crime.

With the presence of risk in both sectors (and assuming risk aversion), interventions in θ will have greater effects in terms of pushing individuals away from crime, because an increase in θ now also makes business relatively less risky. A rise in σ will also have a bigger effect than without uncertainty, because risk aversion will reinforce the rise in crime aversion and further reduce hours in crime.

When people are credit constrained and also receive cash, the effects of a change in σ or θ will be greater with cash than without it. Thus we would expect the two interventions to have larger impacts in combination.

What if an intervention increases time consistency β? This will increase investment in business and an individual's earnings, assuming he was credit-constrained. If people become more time-consistent, they will also be more strongly influenced by the consequences of their actions in terms of punishments, and will therefore reduce criminal labor (and increase business labor) as well.

Finally, while we have focused on crime as an occupational choice, there are other antisocial behaviors that are not as labor intensive. This could include interpersonal aggression, or participation in a short-lived riot or act of collective violence. In this case, cash infusions and increases in business may not have a deterrent effect on these antisocial behaviors. Rather, reductions in behaviors that have a low opportunity cost of time might be more consistent with a change in values σ or punishments f.

Relevance for non-economic aggression   This framework is mainly useful for thinking about crime. More generally, non-instrumental aggression could generate benefits, either in the moment (the pleasure in expressing anger) or longer term (deterring future slights), without incurring an opportunity cost of time. In general, instilling values against aggression will decrease their utility and hence frequency. Improved self control skills could reduce aggression when the benefits are momentary, future costs high, but people are time-inconsistent or subject to temptation. STYL explicitly teaches techniques to regulate emotions in charged, automatic situations.

4   Data

We tried to survey each subject five times: (i) at baseline prior to the intervention; (ii and iii) at "short-run" endline surveys 2 and 5 weeks after the grants; and (iv and v) at two "long-run" endline surveys 12 and 13 months after grants.[17]

The short run surveys focused on immediate impacts of the behavior change program as well as expenditures and investments in the previous two weeks. The long run surveys focused on broader measures of behavior and material well-being. We ran pairs of surveys because it allowed us to reduce noise in outcomes with potentially low autocorrelation such as earnings or criminal activity (McKenzie, 2012). To measure time preferences, risk aversion, and baseline cognitive abilities (such as executive function), following each

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[17]The exception is the 100 men in the pilot, which had a single "short run" survey 3 weeks after grants. Actual survey times were, on average, 2.2, 5.7, 55.4 and 61.1 weeks after grants. Surveys were 90-minutes long and delivered verbally by enumerators in Liberian English on handheld computers.

survey the respondents also conducted 45 minutes of incentivized games and tests.[18] The winnings from all survey activities equalled about a half day's wages.

This sample was exceptionally mobile and difficult to track over time. Roughly 40% changed locations between each round, many changing sleeping places every few weeks or nights. Just 30% had mobile phones. Many were also suspicious or fearful of others and went by several aliases. We made at least four attempts to locate each person, all over the country, including prison (to be interviewed only when released). Averaging across all endline surveys, 92.7% responded. Attrition is relatively unsystematic. Treatment groups had nearly identical response levels, within 0.4% of the control group (see Appendix for response rates by survey wave and treatment group). A joint test of significance of all baseline covariates has a p-value of .092, and the R^2 is just .096.[19]

4.1 Validation of self-reported survey data

A major concern is self-reported data. One worry is social desirability bias, where all subjects underreport unacceptable behaviors. This would understate treatment effects. A more serious concern is misreporting correlated with treatment (experimenter demand). One worries that people who receive an anti-violence message or addiction treatment might be more likely to respond that they are non-violent or drug free to please the experimenter. This would overestimate treatment effects.

In developed countries, administrative data on crime are often preferred, though this typically captures an indirect and attenuated measure of crime, such as arrests, rather than actual levels of crime.[20] There are self-reported behaviors that have a fairly clear gold standard for validation. For school attendance, for instance, one can do spot-checks. It gets difficult where there is no gold standard, as with aggression or thievery.

To test for bias, we developed a new technique to validate a selection of our survey

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[18]The main activities were incentivized inter-temporal choices (patience and present bias); incentivized gambles (risk aversion); and hypothetical large-magnitude inter-temporal choices. At each survey we also used cognitive tests or games to measure cognitive ability. We assessed motor inhibition (i.e. the ability to stop one's self), cognitive flexibility (the ability to switch rapidly from one task to another), working memory (the ability to hold in mind information for short periods), and spatial problem solving (e.g., completing a puzzle). We did not hypothesize an impact on these cognitive abilities, and use the measures as controls only. We describe games in Appendix D. This was done within a few days of the survey and was handled by local specialists. 99% of survey respondents completed the games.

[19]Of the 298 non-responses (of 3,896), we (i) had no location information (75%); men were mentally incapacitated (1%); died (8%, or 9 men); were in prison (12%); or refused (3%). See Appendix A.3. Covariates associated with higher attrition include better mental health and income.

[20]Arrest data also requires the assumption that the intervention does not affect the likelihood that criminal behavior results in arrest, such as a shift in the type or location of crime.

variables through intensive observation. A companion paper reports the approach and results in detail (Blattman et al., 2014). We summarize here and Appendix E.

Of more than 4,000 endline surveys, we randomly selected 7.3% and validated answers to six survey-based measures with two-week recall periods. Beforehand, we chose four behaviors of varying sensitivity—marijuana use, thievery, gambling, and homelessness. Two others were typical social behaviors that we did not consider sensitive but could be subject to recall bias or other error—paying to watch a movie or sports match in a commercial video club, and paying to charge their mobile phone battery at a kiosk. We chose them to have a neutral set of measures for comparison.

Shortly after the survey, one of a small team of trained local validators would visit the respondent four times over ten days, spending several hours in casual conversation and observation. Validators would shadow the respondents as they were going about their day, rather than sit down for a formal interview. The target topics were raised mainly through indirect questions while chatting and conversing. Validators developed techniques to develop trusting and open relationships: becoming close to street leaders; eating meals with subjects; sharing personal information about themselves (including similar acts they or friends engaged in); and mirroring participants' appearance and vernacular as appropriate. Validators would also observe the respondent's behavior from afar, as well as converse with peers and family. Validators developed a routine presence in the study communities.

Without knowing the respondent's survey responses, the authors and validators coded an indicator of whether or not the respondent had engaged in the behaviors in the two weeks prior to the survey. In general we only coded the behavior if the validator directly observed the behavior or the respondent directly admitted it.

This validation is not free from observational error. But these errors, we argue, are less likely to bias treatment effect estimates than the underreporting, experimenter demand, or social desirability bias in survey data. This is the key assumption underlying the validation technique, and without objective data it cannot be tested (and so must be taken with caution). Nonetheless, under this assumption we can: (i) estimate the direction and magnitude of systematic measurement error in each outcomes, (ii) estimate the correlation with treatment arms, and (iii) adjust or bound survey-based causal estimates.

4.2   Qualitative data

We collected longitudinal qualitative data to better understand the context, intervention, and mechanisms. First, a Liberian research assistant acted as a participant-observer during the Phase 1 therapy. Second, we interviewed facilitators for their impressions of

the intervention and participants. Third, three Liberian research assistants conducted semi-scripted interviews, 14 pre-treatment and 130 post-treatment, with 66 men in the sample.[21] Interviews covered job satisfaction, investments, economic challenges, plans, antisocial behaviors, and perceptions of the interventions.[22]

5   Impacts on crime and violence

We estimated intent-to-treat (ITT) effect using an OLS regression of each outcome on three treatment indicators: for an offer to enter therapy only, for being offered a grant only, or for being offered both therapy and cash.[23] All estimates control for all baseline covariates and randomization blocks.

Table 3 reports treatment effects on self-reported behaviors. To reduce the number of hypothesis tests and risk of "false positives", we also test an standardized additive index of all antisocial behaviors (following Kling et al., 2007). The table also reports the mean difference between therapy only and therapy plus cash.

We focus on six classes of antisocial behavior, predefined by survey section. The first is a set of self-reported aggressive and hostile behaviors. This includes nine questions from a standard scale of reactive and proactive (instrumental) aggression, adapted to the context by the authors, such as whether they use yelling and cursing to get people to do things, or whether they tend to lose their temper (Raine et al., 2006). The index also includes ten hostile acts which we deemed relevant in Liberia, such as cheating someone, threatening others, or bullying. An additive index of all 19 questions falls .15 standard deviations with therapy alone and .34 with both.

We also ask about six types of angry disputes and fights in the past two weeks, including angry confrontations and violence involving family members, neighbors, community leaders, or the police. The decline from therapy or both treatments is not statistically significant, though a test of their joint significance has p<.1. Men offered therapy also reported they were about half as likely to go about armed (usually with a knife, as guns

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[21]19 in control, 16 in therapy, 15 in cash, and 16 in therapy then cash. Sampling was purposeful, based on variation in key baseline measures: economic success, crime, drug use, and present bias.

[22]Notes and recorded interviews were transcribed, reread, edited, and analyzed to explore program outcomes and mechanisms.

[23]Where we have two measures of the same variables (i.e. the 2 and 5 week surveys, or the 12 and 13 month surveys) we treat these as separate observations clustered at the individual level (McKenzie, 2012). To reduce sensitivity to outliers, we top-code all continuous variables (e.g. hours worked and dollar amounts) at the 99th percentile. We test sensitivity to alternative estimation strategies and report the results for four outcomes in Appendix F.2. In general, the results are unchanged with and without baseline covariates, and also to treatment on the treated (TOT) estimation.

Table 3: Program impacts on antisocial behaviors, peer quality, and substance abuse

			ITT regression						Both vs.Therapy alone	
			Therapy only		Cash only		Both		(Columns 7 − 3)	
Outcome (No. of questions in index)	Round	Control mean	ITT	Std. Err.	ITT	Std. Err.	ITT	Std. Err.	Diff.	Std.Err.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Index of all antisocial behaviors, z-score	2–5w	0.171	-0.197	[.074]***	-0.089	[.073]	-0.255	[.072]***	-0.058	[.064]
	12–13m	0.034	-0.091	[.081]	0.090	[.082]	-0.223	[.075]***	-0.131	[.066]**
Aggressive and hostile behaviors (19), z-score	2–5w	0.091	-0.173	[.069]**	0.009	[.071]	-0.205	[.071]***	-0.032	[.063]
	12–13m	0.188	-0.154	[.102]	-0.045	[.099]	-0.339	[.102]***	-0.185	[.090]**
Disputes/fights, past 2 weeks (6), z-score	2–5w	0.366	0.089	[.106]	0.054	[.091]	-0.091	[.083]	-0.180	[.092]*
	12–13m	0.273	-0.046	[.107]	0.084	[.104]	-0.122	[.092]	-0.076	[.072]
Carries weapon	2–5w	0.157	-0.086	[.032]***	-0.044	[.034]	-0.093	[.032]***	-0.007	[.028]
	12–13m	0.148	-0.058	[.029]**	0.044	[.032]	-0.065	[.031]**	-0.007	[.027]
Usually sells drugs	2–5w	0.170	-0.080	[.025]***	-0.040	[.027]	-0.072	[.026]***	0.008	[.022]
	12–13m	0.135	-0.037	[.027]	0.033	[.028]	-0.058	[.027]**	-0.021	[.022]
# of thefts/robberies, past 2 weeks	2–5w	2.580	-0.912	[.369]**	-0.842	[.382]**	-1.213	[.384]***	-0.302	[.304]
	12–13m	1.876	0.000	[.362]	0.280	[.362]	-0.721	[.335]**	-0.721	[.326]**
Arrested in past two weeks	2–5w	0.139	-0.007	[.025]	0.007	[.025]	-0.009	[.026]	-0.002	[.024]
	12–13m	0.115	-0.003	[.023]	0.009	[.023]	-0.030	[.022]	-0.027	[.020]

Notes: Robust standard errors in brackets, clustered by individual. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Impacts on crime incidence, in the last two weeks and annualized extrapolation

	Cash + therapy ITT, 12–13 month endline				Annualized impact	
	Control mean	Coeff.	Std. Err.	% change	Control mean	Cash + therapy
	(1)	(2)	(3)	(4)	(5)	(6)
# crimes, past two weeks	2.56	-0.947	[.406]**	-37%	66.5	-24.6
# times sold drugs, past two weeks	0.68	-0.226	[.172]	-33%	17.7	-5.9
# thefts/robberies, past two weeks	1.88	-0.721	[.335]**	-38%	48.8	-18.7
Selling/switching fake goods	0.28	-0.061	[.064]	-22%	7.2	-1.6
Stealing unwatched items	0.34	-0.085	[.078]	-25%	8.9	-2.2
Overcharging or cheating	0.30	-0.101	[.071]	-34%	7.9	-2.6
Burglary	0.10	-0.075	[.033]**	-78%	2.5	-1.9
Con artistry/scams	0.12	-0.092	[.034]***	-78%	3.1	-2.4
Pickpocketing	0.60	-0.194	[.128]	-32%	15.7	-5.1
Mugging	0.09	-0.084	[.046]*	-97%	2.3	-2.2
Armed robbery	0.03	-0.030	[.023]	-92%	0.8	-0.8
Arrested in past two weeks	0.12	-0.030	[.022]	-26%	3.0	-0.8

Notes: Columns (1) to (4) report the same ITT regression as in Table 3, with robust standard errors in brackets, clustered by individual. Columns (5) and (6) simply multiply the two week estimates by 26 weeks to generate an estimated annual impact per person.

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

are rare), whether with therapy or both.

Criminal acts decline most in the therapy plus cash group. Drug selling nearly halves in the short and long run. An index of all thefts and robberies also falls 40% in the long run from 1.9 acts in the past two weeks down to 1.15 acts.

Table 4 disaggregates crimes committed in the past two weeks into the eight acts of theft we surveyed plus drug deals, focusing on the effects of therapy plus cash after one year. Control men committed 2.56 crimes in the previous two weeks, and this fell by almost one crime with therapy plus cash. All types of crime decreased by 20 to 100% with cash and therapy, but the statistically significant (and largest proportional) reductions are in pickpocketing, muggings, and scams (e.g. the sale of non-existent goods, or down-payments for a hidden fortune).

If this decline were persisted for the year, it would translate to 25 fewer crimes per person each year. Given the $530 cost of the two interventions, this is roughly $21 per crime, ignoring any other benefits of the program.

We do not see a statistically significant decline in arrests, though after one year the coefficient on therapy plus cash represents a 25% decline, or about three arrests per year.

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Table 5: Impact heterogeneity based on initial levels of antisocial behavior

Outcome	Round	Coeff.	Therapy only		Cash only		Assigned to both	
			ITT	Std. Err.	ITT	Std. Err.	ITT	Std. Err.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Index of all antisocial behaviors	2–5w	ATE	-0.195	[.073]***	-0.080	[.073]	-0.255	[.071]***
		Interaction	-0.160	[.095]*	-0.067	[.089]	-0.186	[.076]**
	12–13m	ATE	-0.090	[.080]	0.105	[.082]	-0.226	[.074]***
		Interaction	-0.010	[.097]	0.222	[.102]**	-0.201	[.074]***

Notes: We report the ITT regression as in Table 3, with interactions between treatments and baseline antisocial behaviors. Robust standard errors in brackets, clustered by individual. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 6: Comparison of survey and qualitative validation means at endline

Outcome	Survey = validated measure	Survey mean	Validated mean	OLS difference	p-value
	(1)	(2)	(3)	(4)	(5)
Potentially sensitive					
Stealing	79%	0.22	0.20	0.01	0.66
Marijuana	85%	0.48	0.51	0.03	0.24
Gambling	72%	0.18	0.29	-0.02	0.61
Homeless	82%	0.23	0.21	-0.01	0.56
Expenditures					
Video club	62%	0.42	0.61	-0.07	0.06
Phone charging	82%	0.39	0.48	-0.01	0.73
Pot. sensitive (0-4)		1.12	1.21	0.01	0.86
Expenditures (0-2)		0.82	1.09	-0.08	0.09

Notes: Column 1 reports the percentage of respondents for whom both measures are the same (N=240). Columns 2 and 3 display the means of the two measures. Columns 4 and 5 report the coefficient and p-value from an OLS regression of the difference between the survey and qualitative measures on a constant and indicators for blocks, baseline covariates, and validator fixed effects.\

Heterogeneity Table 5 reports ITT regressions where we add an interaction between the treatment indicators and a standardized index for antisocial behavior at baseline. The therapy was impactful for the average participant, but the greatest decline in antisocial behavior was among those with the highest initial levels.

5.1 Validating self-reported data

We summarize results of validation in Tables 6 and 7, with detailed results in Blattman et al. (2014). First, we find that, in the endline surveys, men routinely report behaviors we thought might be sensitive. For instance, at endline, 22% reported stealing in the past two weeks, and 48% admitted to marijuana use.

Second, survey responses closely correspond to validation measures. They are identical in roughly 75% of cases, with the correspondence higher in the most potentially sensitive behaviors, stealing and marijuana use (Table 6, Column 1).

Third, when the two measures do differ, the difference is small and not statistically significant for the potentially sensitive behaviors (Table 6, Columns 2 to 5). Meanwhile, the expenditure-related questions (video club and phone charging) that we expected to be neutral in terms of sensitivity actually appear to be underreported in the survey, though the result is only statistically significant at the 10% level.

Fourth, there is little correlation between treatment status and measurement error in the potentially sensitive behaviors, and if anything results suggests the opposite of experimenter demand. We see this in Table 7, which pools all endline surveys and for each treatment calculates: survey-based ITT estimates for the six variables and composite indexes (columns 1–2 and 7–8); an ITT estimate of the systematic measurement error from a regression of the survey-validated measure difference (in Table 6) on treatment indicators (Columns 3–4 and 9–10); and the difference of these two ITT estimates, i.e. an adjusted or "corrected" ITT estimate after accounting for detected bias from measurement error (columns 5–6 and 11-12). For the sensitive outcomes, none of the correlations between treatment and our proxy for measurement error are statistically significant. What's more, the direction of measurement error suggests that, if anything, the control group underreports unacceptable behaviors, meaning the true treatment effect is larger.

Finally, the control group appears to have underreported expenditures in the survey. This suggests that the weak increases in short-term expenditures we observe from grants (see below) may be overstated, and that the appropriate interpretation is no evidence of an increase short term consumption.

After extensive field work, we believe we see little underreporting in drugs, crime,

Table 7: Estimates of treatment effect bias from measurement error and adjusted treatment effects

	Assigned to therapy						Assigned to cash					
	Survey-based ITT		ITT on survey-validated difference		"Corrected" ITT (Columns 1 − 3)		Survey-based ITT		ITT on survey-validated difference		"Corrected" ITT (Columns 7 − 8)	
Outcome	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Potentially sensitive												
Stealing	-0.056	[.017]***	0.012	[.059]	-0.068	[.088]	-0.050	[.016]***	-0.061	[.056]	0.011	[.091]
Marijuana	-0.065	[.021]***	0.006	[.043]	-0.071	[.071]	-0.026	[.020]	-0.026	[.047]	-0.000	[.079]
Gambling	-0.101	[.017]***	0.036	[.066]	-0.138	[.104]	0.002	[.017]	0.019	[.068]	-0.017	[.109]
Homeless	-0.040	[.018]**	0.010	[.054]	-0.050	[.084]	-0.075	[.017]***	0.099	[.059]*	-0.174	[.088]**
Expenditures												
Video club	-0.011	[.022]	0.066	[.066]	-0.077	[.110]	0.014	[.022]	0.010	[.079]	0.004	[.118]
Phone charging	0.002	[.022]	0.134	[.053]**	-0.133	[.080]*	0.067	[.022]***	0.096	[.050]*	-0.028	[.077]
Pot. sensitive (0-4)	-0.261	[.049]***	0.052	[.128]	-0.312	[.196]	-0.150	[.048]***	0.021	[.125]	-0.171	[.202]
Expenditures (0-2)	-0.009	[.032]	0.193	[.088]**	-0.202	[.142]	0.082	[.031]***	0.102	[.091]	-0.021	[.150]

Notes: The treatment effect estimates (Columns 1 and 7) pool all survey rounds (N=3,764) and regress each outcome on cash and therapy treatment indicators, baseline covariates, and fixed effects for each survey round-randomization block pair. Standard errors are robust and clustered by individual. Estimates of the treatment effect bias (Columns 3 and 9) come from a regression of the difference in the survey and validation measures (from Table 6) on an indicator for random assignment to each or any treatment, controlling for randomization block fixed effects and indicators for each endline round (N=239). Standard errors are robust and clustered by block. The difference between the two ATEs is an estimate of the "true" ATE after correcting for observed measurement error. it is calculated as the linear difference of the estimates and the standard error is calculated via bootstrapping (we performed 1000 draws from the sample, with replacement, and we generated the standard error on $\hat{\theta} - \theta^\Delta$ using the distribution from these draws).

*** p<0.01, ** p<0.05, * p<0.1

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Table 8: Summary of potential channels of impact

Channel	Explanation	Evidence
Opportunity cost	Cash spurs investment and incomes when paired with therapy, raising cost of crime/violence	None
Peer change	Therapy leads men to shed risky peers, with change enabled or reinforced by cash	Short term
Drug abuse	Therapy reduces addiction (direct driver of crime/violence), with change enabled or reinforced by cash	Small, sustained
Self control skills	Therapy increases skills to control anger and criminal temptation, with change enabled or reinforced by cash	Moderate, sustained
Value change	Therapy helps men internalize antiviolent and anticriminal norms, with change enabled or reinforced by cash	Moderate, sustained
Time preferences	Therapy leads to more forward-looking and risk-averse behavior, with change enabled or reinforced by cash	None

stealing, and homelessness because the men most enmeshed in these activities were the least likely to feel stigma, because of their self-image as outcasts. They seemed to speak freely on the topic and seldom hesitated to admit the behavior. This is not something we would have known or could have demonstrated, however, without the validation. The systematic error in expenditures questions is more puzzling, but we see two possible explanations: a strategic interest in over-reporting poverty in order to appear eligible for future programs; and recall bias in expenditure data.

6   Why do crime and violence decrease?

Why did therapy have large, sustained effects on antisocial behaviors, especially with cash? Table 8 summarizes the major potential channels and our evidence, presented in this section. Obviously our research design cannot causally identify the channel at work, and no list is exhaustive, but the patterns of outcomes (plus qualitative data) tend to rule out large changes through some channels (such as a higher opportunity cost, reduced addiction, or changed peers) and favor changes in skills and self image.

Table 9: Self-reported allocation of the grant, by expenditure category

	Treatment group	
Expenditure category	Cash & therapy	Cash only
Consumption and rent	28%	25%
Durable assets	7%	6%
Drugs, alcohol, gambling & sex	4%	4%
Gifts and transfers to others	11%	11%
Business investments and expenses	23%	25%
Savings and debt payments	20%	21%
Own health and education	8%	8%

6.1 Opportunity cost

We assessed grant spending in two ways. Using pictures of different types of spending and plastic chips, we asked grant recipients to indicate how they used the grant. We also collected consumption and expenditure data for the previous two weeks (including spending on capital goods and other "investments"). According to both types of self-reported data, little of the grant was spent on alcohol, drugs, parties, and so forth. Little was "wasted". Table 9 lists average self-reported allocations of the grant by treatment group. We see little effect of the recent therapy on allocation patterns. All differences are statistically not significant.

We report economic outcomes in Table 10. The expenditure survey included a range of business investments in the previous two weeks, at both the 2- and 5-week surveys. Those who received only cash reported $57 more investment in each 2-week period. Thus the total 5-week investment treatment effect is equal to at least $114—almost 60% of the grant. The therapy group resembled the control group in terms of investment. These short run investments do not persist, however. In the cash only group, the stock of business assets after a year is only $20 greater than in the control group, not statistically significant. Therapy has little effect on investment.

Likewise, we see only a short run increase in incomes from cash. We proxied income in three ways: (i) estimated earnings in all activities in the two weeks prior to each survey; (ii) consumption in the two weeks prior to each survey; and (iii) an index of durable assets.[24] We consider these measures individually and an additive standardized index of

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[24]First, we asked each respondent their gross and net earnings in the past four weeks across 25 economic activities (legal and illegal). This earnings measure could still be subject to recall and other biases, and may inadequately capture home production. Thus we also use two measure of permanent income. One is an index of durable assets—a z-score constructed by taking the first principal component of 42 measures of land, housing quality, and small and large household assets. We also conduct an abbreviated consumption

Table 10: Program impacts on investment, income, and employment

			ITT regression						Both vs. Cash only	
			Therapy only		Cash only		Both		(Columns 7 − 5)	
Outcome	Round	Control mean	ITT	Std. Err.	ITT	Std. Err.	ITT	Std. Err.	Diff.	Std.Err.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Investment in past 2 weeks (USD)	2–5w	16.812	8.005	[5.468]	57.001	[7.346]***	47.500	[6.878]***	39.495	[6.797]***
	12–13m	26.121	3.123	[12.468]	19.328	[14.144]	13.532	[12.032]	10.409	[12.098]
Value of business assets (USD)	2–5w	—	—	—	—	—	—	—	—	—
	12–13m	—	—	—	—	—	—	—	—	—
Index of income measures (z-score)	2–5w	-0.145	0.161	[.087]*	0.318	[.094]***	0.223	[.087]**	0.062	[.088]
	12–13m	-0.016	0.137	[.093]	-0.054	[.090]	0.027	[.089]	-0.110	[.086]
Weekly profits, past two weeks (USD)	2–5w	14.342	1.734	[1.407]	4.518	[1.420]***	2.965	[1.370]**	1.231	[1.356]
	12–13m	17.591	0.495	[1.567]	1.370	[1.538]	0.157	[1.713]	-0.338	[1.574]
Durable assets, z-score	2–5w	-0.093	0.128	[.089]	0.151	[.089]*	0.230	[.093]**	0.102	[.092]
	12–13m	0.009	0.141	[.089]	-0.113	[.089]	0.086	[.089]	-0.055	[.085]
Consumption, past 2 weeks, USD	2–5w	44.146	12.056	[3.576]***	26.570	[3.943]***	22.045	[3.312]***	9.988	[3.620]***
	12–13m	47.432	-2.290	[3.561]	-2.586	[3.390]	-5.249	[3.376]	-2.960	[2.472]
Savings (USD)	2–5w	45.957	-1.169	[8.252]	16.679	[9.260]*	18.729	[9.483]**	19.898	[8.932]**
	12–13m	51.395	11.531	[10.270]	2.199	[9.538]	21.726	[10.574]**	10.195	[10.171]
Homeless now	2–5w	0.202	0.006	[.027]	-0.091	[.027]***	-0.095	[.027]***	-0.101	[.024]***
	12–13m	0.147	0.018	[.028]	0.012	[.027]	-0.020	[.028]	-0.037	[.024]
Hours/week of work, past month	2–5w	36.376	0.437	[2.666]	6.717	[2.684]**	1.862	[2.750]	1.425	[2.539]
	12–13m	34.163	1.351	[2.362]	0.945	[2.329]	-1.244	[2.311]	-2.595	[2.158]
Home robbed, past month	2–5w	0.698	-0.028	[.045]	0.002	[.045]	-0.050	[.047]	-0.022	[.043]
	12–13m	0.711	-0.038	[.043]	-0.055	[.041]	-0.016	[.045]	0.022	[.041]
Belongings stolen, past month	2–5w	0.784	0.016	[.037]	-0.006	[.038]	-0.042	[.041]	-0.057	[.036]
	12–13m	0.635	-0.012	[.045]	-0.048	[.046]	0.039	[.047]	0.051	[.041]

Notes: Robust standard errors in brackets, clustered by individual. *** p<0.01, ** p<0.05, * p<0.1

all three. Overall we see a short term increase from cash—a .32 standard deviation rise in the income index from cash alone. But after a year there was no significant change in income or hours worked.

Nonetheless, the short run effect of cash on legal work and income had many positive effects. It increased basic consumption (such as food) and reduced homelessness. But these, like the income gains, were not sustained.

From qualitative interviews, insecure property rights were a major barrier to capital accumulation. A large number of men reported the theft of all their assets, or all their wares, on a regular basis, by criminals or (for market wares) the police.[25] At each survey round, about 70% of the men reported a house robbery and belongings stolen in the past month. This implies a robbery every other month, at least. There is little difference by treatment status, suggesting that men were not more likely to be targeted if they received cash. But they would have had more to lose.

6.2 Self control and other noncognitive skills

Table 11 reports treatment effects on noncognitive skills. We measured them using existing normed scales, which we adapted to use in Liberia (Appendix D).

First, men who received the therapy reported a long-term decrease in impulsive behaviors, by 0.18 standard deviations in the therapy only group, and .21 with both therapy and cash. Examples of questions assessing impulsivity were "I buy things on impulse" or "I say things without thinking".[26]

Men who received therapy also reported lower reward motivation, by .16 standard deviations with therapy only, and .23 with both. The scale assessed whether men reported they are motivated by immediate, typically emotional rewards. Examples include "I will often do things for no other reason than that they might be fun" or "When I see an opportunity for something I like I get excited right away."[27]

In contrast, therapy did not lead to statistically significant long-run effects on conscientiousness and perseverance/grit (continuing in the face of setbacks).[28] Nonetheless,

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module of short-term food and non-food consumption.

[25]In some cases this was theft by a friend, family member, or stranger. Also common was confiscation of wares by the police. Some forms of market selling contravene official rules, often unenforced, but nonetheless giving police opportunities to confiscate. Some confiscation is legitimate, some not.

[26]These questions were selected from the Barrett Impulsiveness Scale-11 (Spinella, 2007) and are designed to assess each subject's inability to control their own thoughts and actions.

[27]Reward orientation was assessed with questions selected from the Behavioral Inhibition/Behavioral Activation Scale (BIS/BAS). Previous research has linked disruptions in and extremes of reward motivation to drug and alcohol abuse (Robinson and Berridge, 2000).

[28]Perseverance was measured using a subset the GRIT scale (Duckworth and Quinn, 2009), which

Table 11: Program impacts on character skills

Outcome (# questions), z-score	Round	Control mean	ITT regression						Both vs. Therapy (Columns 7 − 3)	
			Therapy only		Cash only		Both			
			ITT	Std. Err.	ITT	Std. Err.	ITT	Std. Err.	Diff.	Std. Err.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Index of self control skills	2–5w	-0.046	0.087	[.093]	-0.154	[.099]	0.036	[.091]	-0.051	[.090]
	12–13m	-0.076	0.153	[.082]*	-0.025	[.086]	0.237	[.086]***	0.084	[.078]
Impulsiveness (9)	2–5w	-0.042	-0.011	[.096]	0.185	[.102]*	0.107	[.091]	0.118	[.091]
	12–13m	0.115	-0.175	[.087]**	0.007	[.089]	-0.208	[.090]**	-0.033	[.080]
Conscientiousness (8)	2–5w	-0.112	0.108	[.096]	0.046	[.097]	0.161	[.096]*	0.054	[.095]
	12–13m	0.042	-0.068	[.092]	-0.032	[.094]	0.044	[.091]	0.111	[.085]
Perseverance/GRIT (7)	2–5w	0.016	0.028	[.093]	-0.133	[.100]	0.043	[.099]	0.015	[.093]
	12–13m	-0.077	0.114	[.090]	0.056	[.090]	0.102	[.094]	-0.011	[.086]
Reward responsiveness (8)	2–5w	0.058	-0.073	[.101]	0.109	[.102]	0.013	[.099]	0.086	[.094]
	12–13m	0.038	-0.160	[.091]*	0.079	[.089]	-0.234	[.092]**	-0.075	[.080]
Self control skills (high emphasis)	12–13m	-0.112	0.203	[.085]**	0.035	[.084]	0.164	[.088]*		
Self control skills (low emphasis)	12–13m	-0.029	0.060	[.086]	-0.035	[.089]	0.239	[.090]***		
Economic preferences:										
Patience in game play	2–5w	-0.194	0.174	[.075]**	0.151	[.075]**	0.243	[.075]***	0.069	[.070]
	12–13m	-0.073	0.026	[.081]	0.134	[.077]*	0.097	[.080]	0.071	[.070]
Time inconsistency in game play	2–5w	0.085	-0.042	[.079]	-0.118	[.082]	-0.082	[.081]	-0.040	[.070]
	12–13m	-0.018	-0.034	[.068]	-0.016	[.071]	-0.051	[.070]	-0.017	[.067]
Other noncognitive skills:										
Neuroticism (8)	2–5w	0.080	0.012	[.094]	0.022	[.097]	-0.080	[.099]	-0.092	[.096]
	12–13m	-0.051	0.044	[.087]	0.037	[.091]	-0.146	[.086]*	-0.190	[.081]**
Locus of control (8)	2–5w	0.025	0.000	[.095]	0.059	[.100]	-0.093	[.097]	-0.093	[.098]
	12–13m	-0.019	-0.031	[.088]	-0.106	[.086]	-0.021	[.093]	0.009	[.084]
Self esteem (8)	2–5w	-0.054	0.110	[.090]	-0.012	[.091]	0.187	[.092]**	0.078	[.086]
	12–13m	-0.113	0.078	[.090]	0.058	[.092]	0.188	[.093]**	0.110	[.080]

Notes: Robust standard errors in brackets, clustered by individual. *** p<0.01, ** p<0.05, * p<0.1

the coefficients all point to an improvement. If we assemble all four measures into a standardized index of all self control-related measures, we can reject the hypothesis that all are unchanged. The index increases by 0.15 standard deviations for therapy only and .24 for both, and we can't reject that the two groups have equal effects.

We must be cautious because scales are self-reported, and treated men could simply be repeating back their lessons. There is some evidence this is not so. We divide the 32 self control questions into two indexes: questions with high (43%) and low (57%) emphasis in the curriculum. Table 11 reports the ITT estimates after a year. The effect of cash and therapy is at least as large for low emphasis items.

Other personality measures We also measured three other traits commonly associated with economic performance. Low self-esteem has been linked with many aspects of negative behavior and counterproductive or extreme risk-seeking behavior (Coopersmith, 1967).[29] Men who received both therapy and cash reported an increase in self-esteem, by .19 standard deviations. The effect of therapy only is positive and not statistically significant, but we can't reject that the two impacts are equal.

Meanwhile, therapy does not change locus of control (control they felt over their own lives) or neuroticism (a tendency to experience emotional instability or anxiety). There is weak evidence, however, of a decrease in neuroticism from therapy plus cash after a year. It is not clear if the rise in self-esteem and decline in neuroticism resulted from a self-control skill and self-image change or was independent. Since the therapy did not treat these traits directly, and since we have no theoretical reason to suppose a direct effect, we favor the idea that these result from self control and image change.

6.3 Time preferences

We see no evidence of a persistent change in time preferences as a result of therapy. Men who received therapy played the incentivized games .17 standard deviations more patiently in the short run, but this effect disappears in the long run. We do not see a corresponding change in self-reported patience using survey questions, or in the same game without

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captures the ability to press on in the face of difficulty. Like conscientiousness, it is commonly understood to be impervious to change after adolescence and to reflect stable individual traits. We measured conscientiousness with a subset of the questions from the NEO-five factor personality inventory. The conscientiousness dimension of personality is associated with keeping in mind the needs of others, following societal rules, and controlled, careful behavior.

[29]Examples of questions include, "I am able to do things as well as most other people" or "I take a positive attitude toward myself." Generally self-esteem is a measure of how positively or negatively individuals feel about themselves.

monetary incentives (not shown), nor do we see persistent changes in time-inconsistency or risk aversion in game play.

Interestingly, we see a similar and more persistent increase in patience among men who received cash: they play .15 standard deviations more patiently in the short run, and .13 in the long run (significant at the 10% level). The short-term change could simply be a liquidity effect on game play. The persistence is harder to explain since excess liquidity dissipated. Since the effect is weakly significant, and does not appear in other time preference measures, we discount it.[30]

6.4 Self image and value changes

We noted a sustained rise in self-esteem, above, which could reflect a more mainstream self-image. We did not measure perceived social category directly and so cannot say for certain. But we did measure values in the sense of self-reported attitudes towards crime and violence in the men's own lives—an indicator of the degree to which they have internalized mainstream social norms. Table 12 reports results.

We asked 11 questions about their attitudes regarding the use of violence to solve community or personal problems, such as mob killings of suspected thieves, community stoning of corrupt leaders, or men who beat unfaithful wives or attack their lovers. We also asked 12 questions about their attitude toward participating in crime, including whether they would feel fine with taking goods from an unwatched open room, stealing $100 from someone's pocket, or even stealing their electricity illegally. We also asked about 10 hypothetical forms of political violence, including whether they would consider committing violence in the wake of a stolen election, or whether they discuss protesting with friends or making trouble or conflict with the authorities.

An index of all three measures shows that all treatments decreased the acceptability of violent behaviors in the short run. Cash had little impact on self-reported attitudes in the long run, but therapy plus cash led to a .17 standard deviation decline. We cannot reject that the effects of therapy only and therapy plus cash are equal. The overall effect is driven by attitudes to criminality and political violence.

Finally, at the end of the survey enumerators also reported their impressions of the person's appearance: quality of dress, shoes, cleanliness, smell, and so forth. We hypothesized a change in appearance, although expecting any effect to be difficult to detect since

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[30]Speculatively, it could arise from the fact that the grant was a larger sum of money than most men had controlled before, so they were forced into making more explicit plans and tradeoffs about how to spend it over time.

we capture people in their daily work, which is often manual and dirty (hence even "mainstream" individuals might be unclean or dressed poorly). Nonetheless, we hypothesized and improvement. Surprisingly, however, we see a short run effect from therapy but this is not sustained in the long run.

6.5 Peer change

In addition to asking about their own behavior, we also ask whether the men's peers changed or changed in behavior. We ask men who their five closest peers are, by name, and then ask whether they hold any of 20 qualities ranging from positive (they work hard, save, go to school) or negative (the steal, do drugs, get in fights). Table 12 examines treatment effects. This measure of peer quality goes up significantly in the short run but not in the long run. This suggests that the main mechanism of long run change may not be permanently changed peers. However, see below for an alternate explanation from qualitative interviews.

6.6 Drug abuse

Finally we examine substance abuse. Looking at Table 12, alcohol and drug use show modest declines, especially in the short run. In the long run, therapy leads regular marijuana use to fall from 50% to 47%, and hard drug use falls from 20% to 16%. Qualitative interviews suggested that few men quit drugs altogether. Many stopped hard drugs, but resumed marijuana use. The program also tried to equip participants with strategies to cut back. Indeed, facilitators discouraged quitting "cold turkey" to reduce risk of withdrawal problems.

6.7 Insights from qualitative interviews and observation

Nearly all the subjects we interviewed described feeling ostracized at baseline. In general, the men reported that the therapy pushed them to believe they could be someone better for the first time. The facilitators played an important role here. The participants we interviewed unanimously had admiration and praise for the facilitators, highlighting that their backgrounds demanded respect and credibility among respondents, while their personal stories of change were encouraging.

Beyond modeling the change in self image and social category, men reported the facilitators were also sometimes the first people to treat them with seriousness and respect,

Table 12: Impacts on other self-reported attitudes and behaviors

Outcome (# questions), z-score	Round	Control mean	ITT regression						Both vs.Therapy (Columns 7 − 3)	
			Therapy only		Cash only		Both			
			ITT	Std. Err.	ITT	Std. Err.	ITT	Std. Err.	Diff.	Std. Err.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Index of violent/criminal attitudes, z-score	2–5w	0.172	-0.228	[.093]**	-0.225	[.094]**	-0.200	[.098]**	0.028	[.084]
	12–13m	0.045	-0.080	[.080]	0.013	[.079]	-0.176	[.079]**	-0.096	[.065]
Attitudes toward use of violence (11)	2–5w	0.021	-0.141	[.097]	-0.201	[.098]**	-0.057	[.099]	0.084	[.094]
	12–13m	0.051	0.017	[.100]	0.080	[.101]	-0.045	[.101]	-0.063	[.090]
Attitudes toward criminality (12)	2–5w	0.139	-0.177	[.099]*	-0.154	[.103]	-0.242	[.101]**	-0.064	[.089]
	12–13m	0.044	-0.063	[.094]	-0.041	[.092]	-0.242	[.093]***	-0.179	[.079]**
Attitudes on political violence (10)	2–5w	0.217	-0.250	[.110]**	-0.204	[.107]*	-0.198	[.117]*	0.052	[.102]
	12–13m	-0.005	-0.104	[.083]	0.008	[.083]	-0.143	[.084]*	-0.040	[.069]
Violent/criminal attitudes (high emphasis)	12–13m	0.013	-0.097	[.095]	-0.041	[.092]	-0.170	[.092]*		
Violent/criminal attitudes (low emphasis)	12–13m	0.048	-0.070	[.080]	0.015	[.080]	-0.182	[.079]**		
Index of quality of appearance	2–5w	-0.108	0.103	[.074]	0.116	[.075]	0.180	[.073]**	0.077	[.069]
	12–13m	0.009	-0.094	[.073]	-0.074	[.072]	-0.091	[.076]	0.003	[.070]
Positive peer qualities (20), z-score	2–5w	-0.160	0.207	[.084]**	0.014	[.088]	0.234	[.087]***	0.027	[.079]
	12–13m	0.040	0.011	[.081]	-0.070	[.083]	0.017	[.083]	0.006	[.080]
Usually uses marijuana	2–5w	0.500	-0.102	[.034]***	-0.002	[.033]	-0.132	[.033]***	-0.030	[.035]
	12–13m	0.495	-0.029	[.033]	0.014	[.032]	-0.046	[.033]	-0.018	[.032]
Usually takes hard drugs	2–5w	0.209	-0.029	[.025]	-0.013	[.027]	-0.009	[.028]	0.020	[.023]
	12–13m	0.200	-0.007	[.028]	0.075	[.030]**	0.005	[.029]	0.013	[.026]

Notes: Robust standard errors in brackets, clustered by individual. *** p<0.01, ** p<0.05, * p<0.1

and how this built their confidence to reintroduce themselves to community members, or to expose themselves to banks and shops.

Attempts to behave normally, especially the exposure to new social situations, reinforced skill and identity change. Many of the men failed in their plans, or experienced stigma in their shop or bank visits. In group sessions, men discussed what went wrong and why (poor decisions, or choice of dress). Men with setbacks learned from and were encouraged by the positive experiences of others. And facilitators sometimes observed men's homework attempts and coached them through difficulties.

We also saw striking transformations in the men's appearance. The first day men typically arrived with long or messy hair, facial hair, dirty or ripped clothing, wearing t-shirts with shorts and sandals. Their demeanor was tough, and their appearance signaled their outcast status. Haircuts were offered in the second week, and many men took advantage, symbolizing the change. But others showed up before this having gotten a haircut on their own. Similarly, before the unit on hygiene began, many men began arriving in pants, shoes, and collared shirts. Typically a few men in each group refused the haircut and continued to dress tough. But after seeing the positive experiences of others, they too began to arrive more clean cut, trying out the new image. The quantitative results confirm this short-term change in appearance.

A year later, therapy participants also described applying skills of self-regulation in their lives. To avoid fights, they used new tactics: removing themselves from emotionally-charged situations, allowing space to process their feelings, and ignoring negative automatic thoughts in the favor of more logical, controlled thinking. Related to these strategies were improved social and communication skills. Interviewees described how these communication skills allowed them to engage with community members or in disputes and express themselves without confrontation or violence.

Not only did the community regard them differently, many said, but troubled young men began coming to them for advice and lessons learned from the therapy once they saw the sudden and sustained change–another important source of reinforcement, and perhaps one reason we do not see a change in peer quality in the data.

7 Discussion

We show that a cheap, short program of therapy for high-risk urban young men reduced a variety of violent and criminal behaviors by 30 to 50%. The effects persisted for at least a year when followed by a simple cash transfer. These effects are large enough

that, given that we find no evidence of misreporting in the qualitative validation, it seems unlikely they reflect bias from the treatment group underreporting bad behaviors. This is a dramatic behavior change, with potentially huge social benefits. Why was it effective? Is it scalable? And why didn't it reduce poverty?

7.1   Lessons from the cash transfer

This supposedly undisciplined, lawless group of men largely invested and saved an unconditional grant. Little was spent on temptation goods. This example joins a body of work showing that people seldom "waste" cash (Evans and Popova, 2014).

In the short run, men used the cash for petty trade, earning high returns to capital. For instance, the impact on earnings ($8.80 a month) represents a monthly return of 4.4% on the $200 grant, while the impact on non-durable consumption ($53 per month) represents a monthly return of 26.5%. While there are reasons these figures might overstate returns, recall that men only invested about $114 in the month after the grant, implying returns on actual investment are much higher. Without monthly data on how long gains lasted, however, we can't say whether the cash grant passed a cost-benefit test in private monetary returns alone.

There were social spillovers, however. The income gain had little effect on aggression, but those who received the cash reduced stealing incidents by a third. This is consistent with rural ex-combatants in Liberia, who shifted away from (but not entirely out of) illicit activities when a program raised their farm productivity (Blattman and Annan, 2014). This suggests that capital can stimulate employment, and the income gains can help deter economically-motivated crime and violence.

After a year, however, these investments and income gains have disappeared. This contrasts with a growing literature showing that poor young people in Africa invest cash transfers and increase self-employment and incomes.[31] One possibility is that our sample was poorly prepared for business. Existing studies showing high returns to cash typically screen for existing entrepreneurs or high-ability unemployed (e.g. requiring business plans) or provide training and framing.

Our evidence, however, suggests that risk and economic shocks may play a large role in explaining business failure, especially insecurity of property. The men's homes and neighborhoods were highly insecure. Extrapolating from reports of burglary and theft at each endline (Table 10), men in our sample experienced a theft or robbery roughly eight times

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[31]Haushofer and Shapiro (2013); Fafchamps et al. (2014); Blattman et al. (2014, 2015)

in the year after the grant. While treated men were no more likely to experience theft, they had more to lose. These shocks may have eliminated the accumulated investment and savings of the men's nascent businesses.

A key lesson for the growing practice of cash transfers to the poor, then, is that removing credit constraints via cash may not be sufficient to increase self-employment when property rights are poorly protected and insurance markets are mostly absent.

Nonetheless, the fact that cash was well used is important, since concerns about temptation spending restrain political support for welfare programs. The men received a few months worth of income, and basic consumption—especially basic shelter and food—improved for about that length of time. This is important.

Future research ought to study how to make the economic effects of cash more sustained. Given that insecurity and other shocks seemed to have set men back, it may be that helping people relocate to better quality neighborhoods, helping them enhance personal security, or providing the information and means to gain necessary licenses or protection from security forces might reduce the risk of theft. Alternately, programs can try to provide crude insurance. It is possible that regular cash transfers would stimulate enterprise development more than the one-time transfer we study.[32]

7.2   Lessons from behavior change

First, we observed sustained changes in self control skills and values linked to antisocial behaviors. Historically, impulsivity and reward motivation have been considered stable traits. However most therapies for extreme risky behavior, such as substance abuse or criminality, attempt to teach tactics for shifting impulsive behavior. Our evidence suggests that these are malleable characteristics that can be changed by exposure to group therapy, at least with this subject group and context. Conscientiousness and grit receive much more emphasis in the economics literature on noncognitive skills, but these seem to be less affected by the therapy, and perhaps less malleable in adulthood. Overall, these results echo the effects of adolescent CBT programs in Chicago that target similar automatic behaviors (Heller et al., 2015).

Second, we saw ample evidence that shifting behaviors led to changes in self image and reputation, and with it the values and norms to which the men subscribe. Qualitatively

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[32]In Ghana, Karlan et al. (2012) show that a cash transfer only improved farmers' incomes when it was accompanied by insurance, and in Mexico Bianchi and Bobba (2013) show that expectation of an annual cash transfer effectively provided insurance and was at least as important as the relieving of credit constraints in stimulating self-employment.

the changes in appearance, in community regard, and in interaction were particularly important, at least in the short run. The basis of CBT is that such positive interactions challenged respondents' negative beliefs about themselves, and reinforced their self image as more responsible, mainstream members of society.

STYL's focus on planful skills and image change in addition to automatic behaviors could explain why the changes in antisocial behavior are more sustained in Liberia than the Chicago studies mentioned above. However, the difference in contexts is so great that comparison is difficult. Nonetheless, the attention to noncognitive skill change and self image, the targeting of the highest-risk men, as well as the non-residential nature of the therapy, correspond closely to best practice in criminal rehabilitation in US correctional institutions (Andrews et al., 1990; Lipsey, 2009). Moreover, a randomized trial of another NEPI intervention that did not follow these principles had no effect on attitudes, values, or behaviors, despite having some of the same facilitators and trainers (Blattman and Annan, 2014).[33]

Understanding the cash–therapy interaction

The qualitative evidence and psychological theory both suggest that the cash was akin to an extension of therapy, in that it provided more time for the men to independently practice and reinforce their changed skills, image, and behaviors. The therapy was brief— just eight weeks long. It helped men change their intentions, image and behavior, and provided almost daily commitment and reinforcement. After eight weeks they were left to themselves, and had to contend with the usual economic and peer pressures. The grant, however, provided men with the cash they needed to maintain their new image—to avoid homelessness, to feed themselves, and to continue to dress well. They had no immediate financial need to return to crime.

The men could also do something consistent with their new image and skills: execute plans for a business. This was a source of practice and reinforcement of their newfound skills and identity. It was also a form of performance, to themselves as well as their

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[33]Prior to this study, NEPI was hired by an international non-profit to conduct a residential group therapy program for rural ex-combatants, in tandem with agricultural training. While there was overlap in curriculum with STYL, the residential therapy had a more diverse array of topics (including dealing with trauma and civic education); did not formally include homework or follow-up or exposure to new social interactions; and socialized young men in an artificial environment outside their home. The subjects were considered high-risk but had lower rates of crime, drugs, and violence than their urban STYL counterparts. Given differences in design, facilitators, and subjects, we cannot causally attribute the absence of impacts on antisocial behavior to the therapeutic approach, but the difference is consistent with the theory underlying CBT.

peers, family, and neighbors who could see the men engage in legitimate business. Our qualitative interviews also suggested that the cash allowed people to navigate mild shocks while getting their life on a new track.

In this way, the grant may have parallels to "booster sessions" commonly used in therapy. A small body of experimental research on CBT for aggression or substance abuse indicates that follow-up therapy sessions weeks or months after the intervention improves long term outcomes (e.g. Lochman, 1992).

Caution is warranted, however. While our interpretation of the cash-therapy interaction is supported by the qualitative data and related research in psychology, quantitatively it is more of a residual explanation, since the evidence supports none of the alternatives. We cannot reject the hypothesis, for instance, that the positive reinforcement from winning a cash grant alone was enough to reinforce therapy. In future, more direct evidence is needed. A comparison of extended therapy to shorter therapy plus cash would be one such test.

Nonetheless, high short-run returns to capital and sustained social spillovers suggests that the combination of cash and therapy had promising returns. Since the private returns to the grant were temporary, however, the cost effectiveness rides mostly on the social benefits from roughly one fewer crime per week per person. These social returns are unknown. If these social returns are greater than $20 or $25 per crime, however, the STYL program is a promising investment on the crime reduction alone.

7.3   Generalizability

There are several reasons this approach has promise beyond Liberia. The therapy, while developed by Liberians, was substantially adapted from US-based CBT programs, suggesting that adaptability to other contexts is feasible. We also kept the intervention low-cost and created a publicly-available manual, curriculum, and training guidelines to ease adaptation and replication. Finally, the theory and results are consistent with comparable US programs and best practice.

The identity of NEPI facilitators seem important. While CBT has been shown to be effective independent of such "therapist effects", they are believed to be important in program effectiveness (Beck, 2011). Nonetheless, facilitators were graduates of past NEPI programs, meaning facilitators can self-perpetuate. Also, levels of experience and human capital in Liberia are lower than in most countries. Together this suggests that developing qualified and effective facilitators in other places is feasible.

There are obvious limits. For instance, there were no gangs or armed groups vying for

men in our sample. CBT-based approaches may be most effective against disorganized, impulsive crime and violence rather than organized crime. There is also selection onto the street, and a country which has experienced many negative shocks (such as Liberia) might have more high-potential young men who need only a little help to regress to the mean.

Moreover, recall that compliers were less than half the high risk population: a third of the high risk men we identified refused to engage with NEPI, and a third of those that entered therapy did not complete it. Our treatment effects, while large, are local effects, relevant to men who comply with the program when offered. On the other hand, our evidence from dropouts suggests that the most antisocial men stay, and the program is most effective with them.

These limits are speculative without further testing, however, and replication and experimentation seem more than warranted given the results in Liberia, Chicago, and elsewhere. Combining therapeutic approaches with economic assistance, including longer term assistance than a single cash grant, seem especially important to test.

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