Trust and reciprocity among former child soldiers: An experimental approach

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Definition

UNICEF (1997) defines *child soldier* as follows:

"Any person under 18 years of age who is part of any kind of regular or irregular armed force or armed group in any capacity, including but not limited to cooks, porters, messengers and anyone accompanying such groups, other than family members. The definition includes girls recruited for sexual purposes and for forced marriage. It does not, therefore, only refer to a child who is carrying or has carried arms."

Background

- Liberia founded in 1840s by freed American slaves
- Over 15 tribes (Blattman & Annan, 2010)
- Tribal tensions led to 14 years of civil war between 1989 and 2003
- 70% of fighters were children (Integrated Regional Information Networks, 2003)

Literature review

- Lack of trust among former child soldiers is a theme in literature from many disciplines
  - Psychology (O'Callaghan, Storey, & Rafferty, 2012)
  - Anthropology (Dickson-Gómez, 2002)
  - Literature (Moynagh, 2011)
- Few study economic impacts, and fewer use statistical analysis with control group
- None experimental

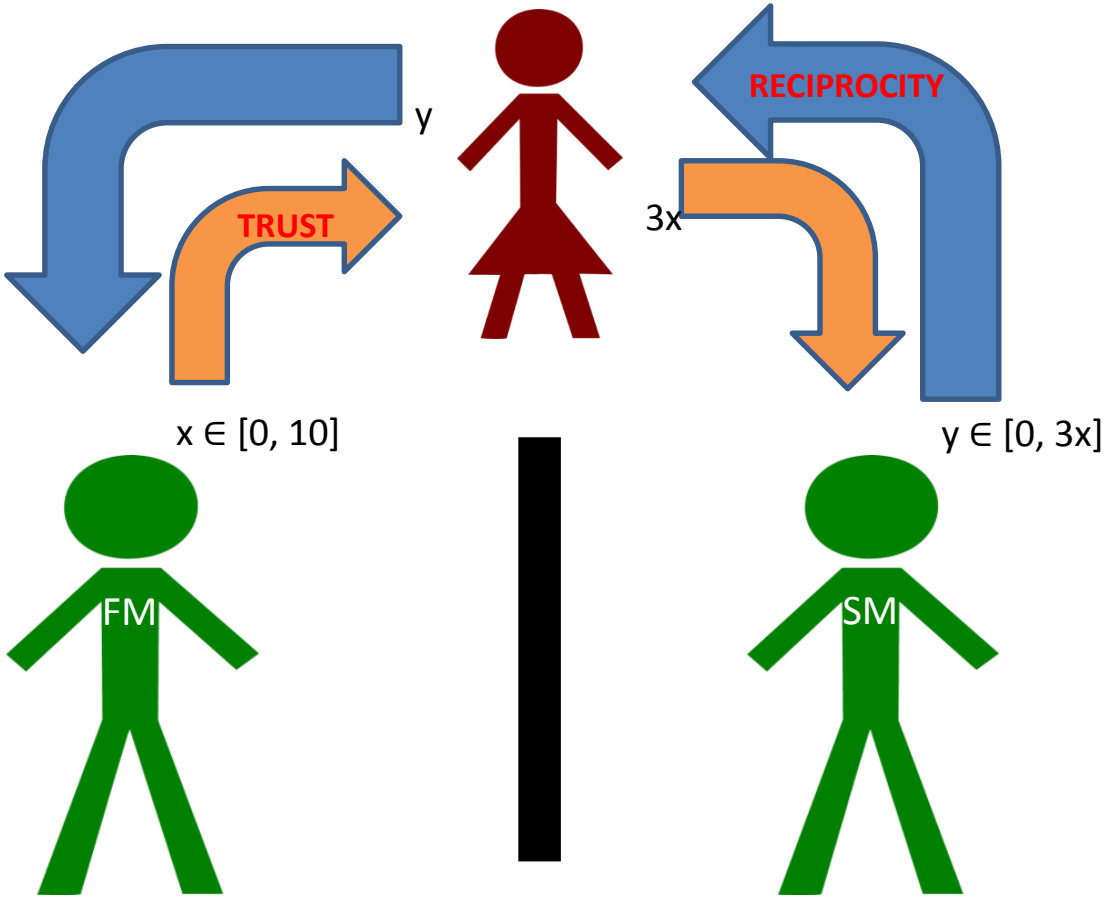
Literature review

- Compared with non-soldiers, child soldiers in Uganda showed worse economic outcomes (Blattman & Annan, 2010)
  - 10% less schooling
  - Twice as likely to be illiterate
  - Lower quality jobs than non-soldiers

Literature Review

- Higher economic growth rates in countries with higher trust & cooperation (Knack & Keefer, 1997)
- More investment in more trusting countries (Zak & Knack, 2001)

Experimental procedure



The investment game (Berg, Dickhaut, McCabe, 1995)

Experimental design

- Setting: Saclepea, Liberia.
  - 375 km from Monrovia
  - <20,000 residents
  - weekly market, small daily shops, subsistence farming
  - home to tribes on both sides of war
  - rebel recruiting and training ground for child soldiers (Trussell & Moore, 2012)
- Recruitment: word of mouth by locals, radio

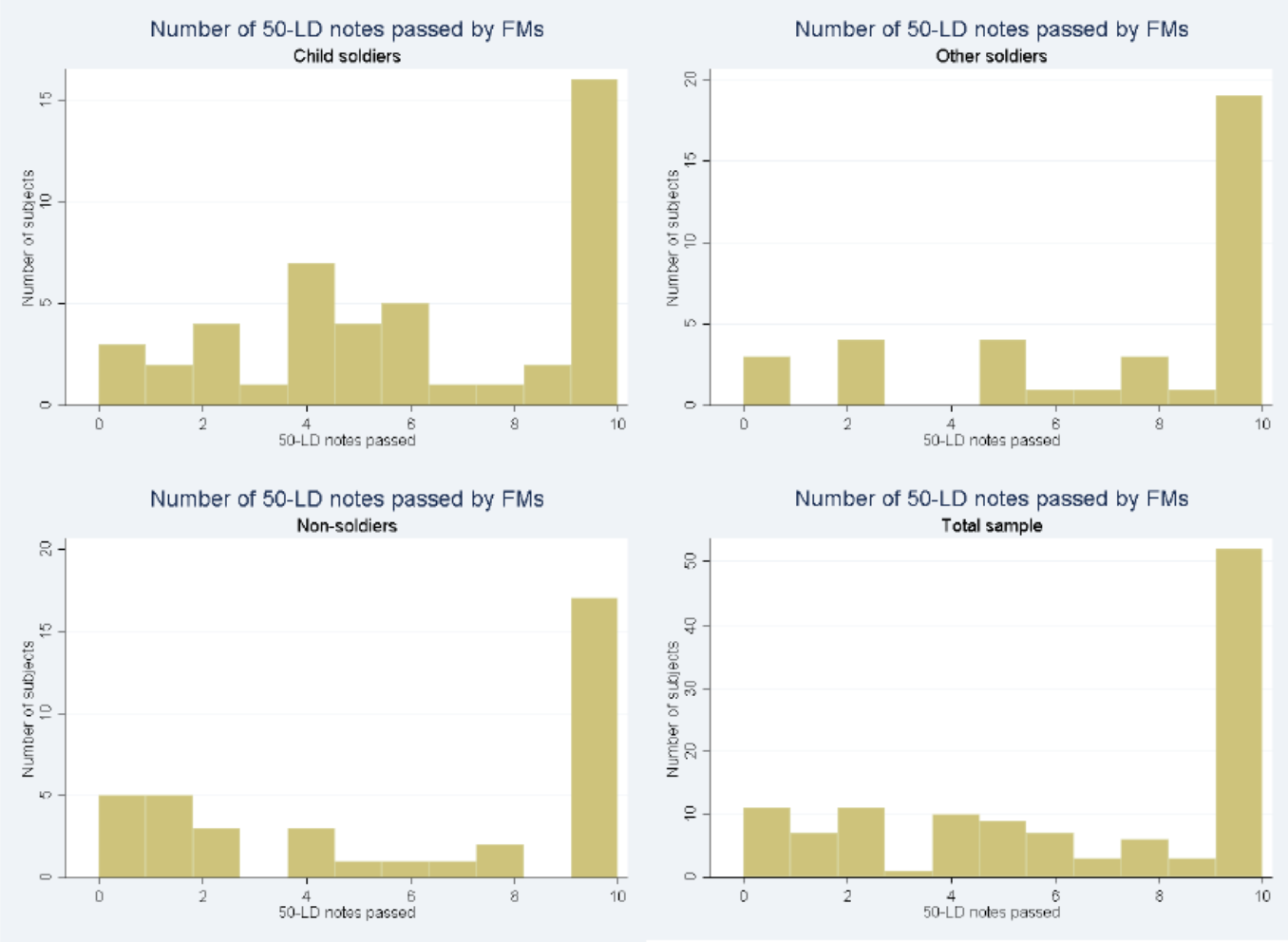
[source: World Food Programme, 2011]

Experimental design

- 240 male subjects: child soldiers (CS), non-soldiers (NS), & other soldiers (OS)
  - Study each type of subject in both FM and SM roles
  - Look for differences among groups in both trust (FM) and reciprocity (SM)

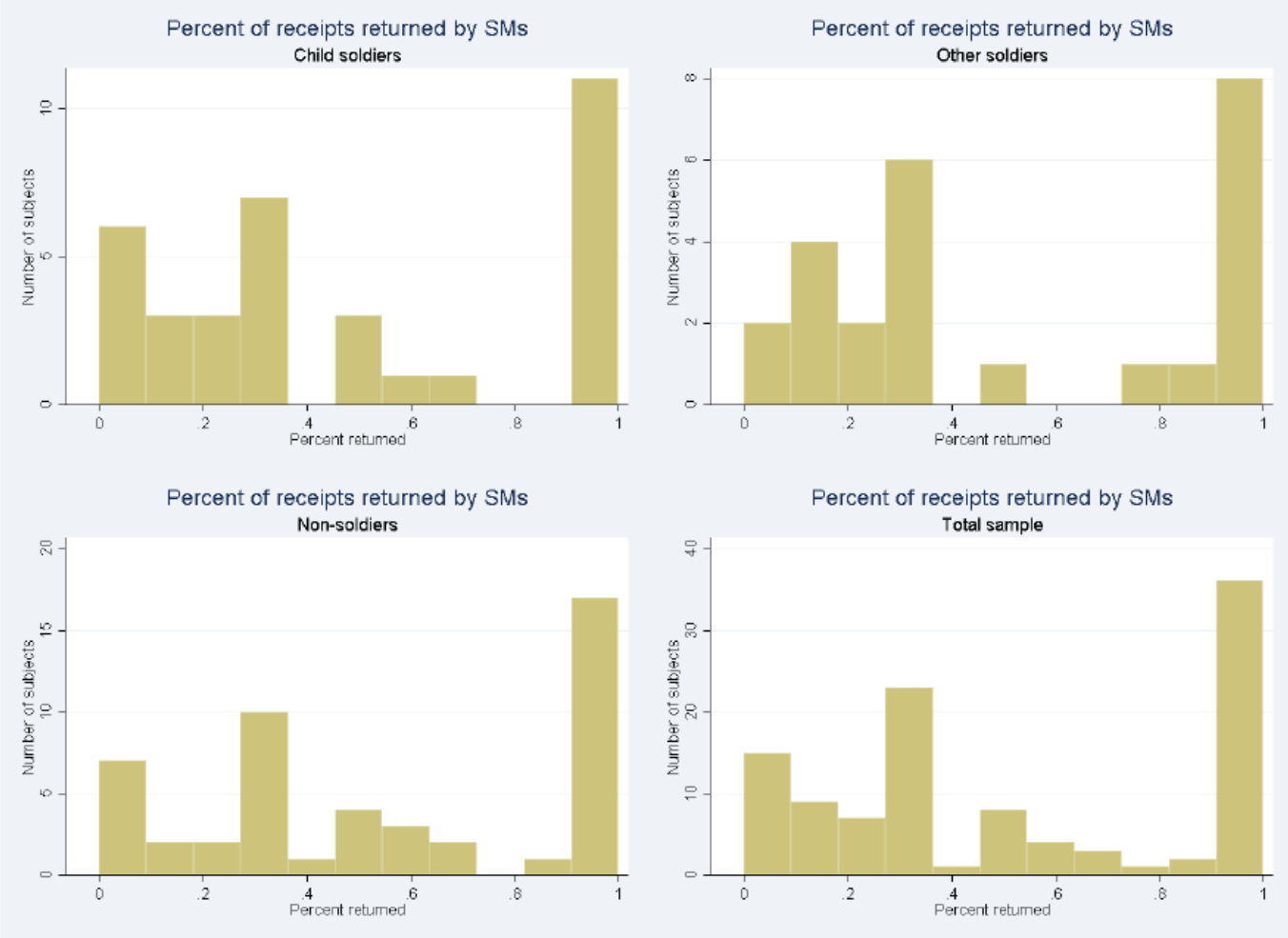
Distribution of FM Results

Figure 2. Amounts passed by first movers



Distribution of SM Results

Figure 3. Percent returned by second movers



Analysis

- Right-censored negative binomial

First Mover Model

$$\ln(\mu_{sent}) = \alpha_0 + \alpha_1 * treat + \alpha_2 X$$

Second Mover Model

$$\ln(\mu_{returned}) = \beta_0 + \beta_1 * treat + \beta_2 * received + \beta_3 * treat * received + \beta_4 X$$

- Among child soldiers, control also for violence level.
  - witnessed violence
  - experienced violence
  - perpetrated violence

Primary Results

- First Movers
  - Child soldiers sent 1.46 times what was sent by non-soldiers ($73 LD for every $50 LD)
  - Child soldiers sent 1.88 times what was sent by adult soldiers ($94 LD for every $50 LD)
  - No difference between non-soldiers and adult soldiers
- Second Movers
  - No difference among the three groups
  - All reciprocate progressively (receive more, return more)
  - **Among soldiers, those younger when involved in war returned less**

Primary Results

- Looking at violence levels among child soldiers
  - Violence level did not affect FM behavior
  - As SMs, victims of violence returned .29 times the number of 50-LD notes that were returned by those who only witnessed violence.
  - Perpetrators of violence did not behave differently than those who only witnessed violence.

Primary Results

- Liberian subjects are more trusting than American subjects
  - USA data from Berg, Dickhaut, McCabe (1995) and Cox (2004)
    - No statistically significant difference between two USA datasets
- In past investment game studies Africans have shown less trusting and less reciprocal behavior than subjects on any other continent. (Johnson & Mislin, 2011)

Conclusions

- FM results:
  - Child soldiers are more trusting than other subjects
    - Forced to trust for survival during formative years
    - Conditioned to expect reciprocity
- SM results:
  - Child soldiers are less reciprocal than other soldiers, driven by age at beginning of involvement
  - Victims of violence less reciprocal than other violence levels
    - More intense experience than those who witnessed violence
    - Those who perpetrated violence may have held higher positions

Conclusions

- Liberia vs. Others
  - Liberians more trusting than Americans
    - Single- vs. double-blind
    - Historically tribal, community-driven society
    - Need to survive during and after war
  - Liberians trust and reciprocate more than other Africans
    - Other African results tied to slave trade history
    - Liberian history is uniquely influenced by USA
    - Current task: looking more closely at these other African nations

Contribution and Future Research

- My results conflict with existing literature from other disciplines that claim trust deficiencies among child soldiers
- Need for additional carefully constructed, scientific research
  - More experiments to rule out motivations other than trust & reciprocity
    - Other-regarding preferences (Cox, 2004)
    - Risk attitudes
  - Further test causal relationship between war and changes in investment behavior by looking at similar African nations that have not experienced war.

Other Interesting Results

- All types returned more if they were sent more
- CS vs. NS
  - FM: older subjects sent more
  - SM: older subjects returned more
- CS vs. OS
  - FM: high school graduates sent more
  - SM: reintegration participants returned less

Table 5. Censored negative binomial models for second movers

VARIABLES	(1) CS vs. NS	(2) CS vs. OS	(3) NS vs. OS
TreatA (=1 if CS)	-0.41	1.07	
	(0.659)	(0.803)	
TreatB (=1 if NS)			0.66
			(0.749)
Amount received	0.04*	0.06***	0.05**
	(0.019)	(0.021)	(0.023)
Treat*received	-0.00	-0.03	-0.05
	(0.028)	(0.028)	(0.088)
Age at experiment	0.05*	0.01	0.05
	(0.027)	(0.033)	(0.028)
Age joined war		0.12**	
		(0.053)	
Months fought		-0.01	
		(0.006)	
Reintegration dummy		-0.66**	
		(0.279)	
HS grad	0.31	0.54	0.32
	(0.257)	(0.339)	(0.288)
Worked last week	-0.17	-0.04	-0.25
	(0.268)	(0.285)	(0.268)
Constant	-0.31	-1.05***	-0.80
	(0.827)	(1.370)	(0.278)
ln(Alpha)	-0.51*	-2.16	-0.55**
	(0.275)	(0.349)	(1.157)
Observations	95	65	78

Table 6. Censored negative binomial models for child soldiers alone

VARIABLES	(1) First movers	(2) Second movers
Amount received (SMs only)		0.03*
		(0.018)
Violence perpetrated	0.45	-0.78
	(0.331)	(0.524)
Violence experienced	-0.06	-1.24***
	(0.330)	(0.427)
Age at experiment	-0.00	0.06
	(0.041)	(0.038)
Age joined war	0.14***	0.17**
	(0.049)	(0.087)
Months fought	0.00	0.00
	(0.004)	(0.007)
Reintegration dummy	0.71**	-0.61*
	(0.301)	(0.331)
HS grad	-0.14	-0.18
	(0.273)	(0.440)
Worked last week	0.60**	-0.10
	(0.239)	(0.371)
Constant	-16.27	-2.35
	(0.902)	(1.588)
ln(Alpha)	-1.19	-1.65**
	(782.907)	(0.723)
Observations	45	39

Table 7. Group means, non-parametric, and parametric tests- Liberia vs. USA

Data	Send Mean	% Returned Mean*	Means Test	Mann-Whitney Test	Epps-Singleton Test	Kolmogorov-Smirnov Test
Total Sample	6.15 [3.65] {184}	44.83% [36.11%] {165}				
Liberian subjects	6.46 [3.74] {120}	52.91% [37.32%] {109}				
USA subjects	5.56 [3.44] {64}	29.08% [27.76%] {56}				
Lib send vs. USA send			.90 (.0567)[a]	3308.5 (.569)[a]	12.49 (.0140)	-.21 (.024)[a]
Lib %return vs. USA %return			.23 (.0000)[a]	1941 (.682)[a]	53.62 (.0000)	-.33 (.000)[a]

Censored Negative Binomial (SM return)

USA*Received	Received	Cons	ln(Alpha)
.005	.04	.98	-1.13
(.448)	(.000)	(.000)	(.000)

Standard deviations in brackets; number of observations in braces; p-values in parentheses;
[a]indicates one-tailed test.
*Second movers who received zero certificates are excluded.

Description of non-parametric tests

- Mann-Whitney (1947) – likelihood that samples are drawn from identical random variables
- Epps-Singleton – similarities between empirical characteristic functions. More powerful than Kolmogorov-Smirnov. (Goerg & Kaiser, 2009)
- Kolmogorov-Smirnov – similarities between cumulative distribution functions. Not valid for discrete data (Smirnov, 1948)