Risky Choices and Solidarity: Why experimental design matters

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Outline

1. Motivation
2. Methodology
3. Hypotheses
4. Identification strategy
5. Results
6. Conclusion
Motivation

Informal risk sharing in developing countries:
- Informal exchanges of gifts or loans between family/community members
- Motivated by social preferences and reciprocity

Research question:
- Does informal monetary support depend on whether individuals (donors and beneficiaries) can control their risk exposure?

Motivation:
- Sources of income shocks:
  - risky choices (e.g. investments)
  - completely random events (e.g. accidents which affect work capacity)
- Distinction is relevant for solidarity:
  - beneficiaries who take risk and fail might be held responsible
  - donors might feel less obliged to share profits from investments
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Literature:

- **Risk taking (opting into risk):**
  - lab experiments with European/US students (e.g. Cappelen et al. 2013, Cettolin/Tausch 2015, Trhal/Radermacher 2009)
  - lower mutual support when neediness is self-inflicted

- **Insurance (opting out risk):**
  - field-/lab experiments in developing countries (e.g. Landmann et al. 2012, Lenel/Steiner 2017, Lin et al. 2014)
  - availability of insurance reduces informal support

Our contributions:

- First evidence for effect of risk taking on solidarity for developing countries
- Test three competing explanations for effect
- Show that randomization is not sufficient to identify effect and offer a solution
Motivation

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The experiment
Experimental setting

Location:
- *Busara Center for Behavioral Economics* in Nairobi/Kenya
- 25 networked PCs with touchscreens, ztree, research assistants
- large subject pool with residents of Nairobi informal settlements (extreme poverty and uncertainty, solidarity deeply rooted in culture)

Main experiment:
- 13 sessions in December 2017
- 238 participants: residents of the Kibera slum, completed at least primary school
- between-subject design
- structure: risk preference game - risk solidarity game - questionnaire
The experiment
Risk solidarity game

Random draw of project → Matched with partner → Conditional transfers to worse-off partner → Expectations on transfers of better-off partner → Hypothetical choice of project → Realization of outcomes

Choice of project → Matched with partner → Conditional transfers to worse-off partner → Expectations on transfers of better-off partner → Realization of outcomes

Projects

Safe 500
Risky 1000, 0
p=0.5

500 → 0
1000 → 500
1000 → 0
0 ← 500
0 ← 1000

Safe 500
Risky 1000, 0
p=0.5
The experiment

Implications of design

- Becoming needy (i.e. having payoff of 0):
  - just bad luck in RANDOM
  - involves a voluntary decision for lottery in CHOICE

- Risky project is mean-preserving spread of safe project:
  - risk can be avoided at no cost
  - simple benchmark: upper/lower bound for situations where risk is desirable/undesirable

- Anonymous one-shot game:
  - excludes social pressure or reciprocity considerations
  - isolates effect of risk taking on giving motivated by social preferences
  - we estimate an upper bound on the effect expected outside the lab
The experiment

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Table 1: Expected treatment effects (CHOICE vs. RANDOM) on transfers to worse-off partners

<table>
<thead>
<tr>
<th>DONOR'S PROJECT</th>
<th>ALL</th>
<th>SAFE</th>
<th>RISKY</th>
</tr>
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<tbody>
<tr>
<td>Partner's project</td>
<td>all</td>
<td>risky</td>
<td>safe risky risky vs. safe</td>
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H1. CHOICE reduces transfers < 0

Possibility to control risk exposure reduces transfers.
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H1. CHOICE reduces transfers

Possibility to control risk exposure reduces transfers.

H2. Attributions of responsibility (e.g. Cettolin/Tausch 2015)

Lower willingness to support unlucky risk taker who self-inflicted his neediness.
Hypotheses

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**H1. CHOICE reduces transfers**

< 0

Possibility to control risk exposure reduces transfers.

**H2. Attributions of responsibility** (e.g. Cettolin/Tausch 2015)

< 0 = 0 < 0

Lower willingness to support unlucky risk taker who self-inflicted his neediness.

**H3. Choice egalitarianism** (Cappelen et al. 2013)

< 0 < 0 = 0

Higher willingness to support subjects making the same choice of project.
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H3. Choice egalitarianism (Cappelen et al. 2013)

Higher willingness to support subjects making the same choice of project.

H4. Less sharing of income from risk taking (D’Exelle/Verschoor 2015)

Donors feel less obliged to share income from risk taking compared to income received by pure luck.
Identification strategy

Distribution of projects differs across treatments

- **CHOICE:** all subjects receive their preferred project ($R_i = R_i^*$ for all subjects)
- **RANDOM:** some subjects get unwanted projects ($R_i \neq R_i^*$ for some subjects)

Average transfers in RANDOM yield biased counterfactual of interest:

- being in a non-preferred project may negatively affect transfers
- risk preferences may correlate with other-regarding preferences
- share of subjects in the risky project differs across treatments
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Our strategy:

- Elicit preferred project for all subjects in RANDOM by hypothetical question
- Compare transfers of subjects with $R_i = R_i^*$ across treatments

Preferred projects must be correctly measured in RANDOM:

- Extensive tests confirm this: [Tests]
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Preferred projects must be correctly measured in RANDOM:

- Extensive tests confirm this: [Tests]
Results

Transfers to worse-off partners

(a) Naïve treatment effects

(b) Unwanted projects matter

(c) Causal treatment effects
Results

Transfers to worse-off partners

Table 3: Expected and estimated causal treatment effects (CHOICE vs. RANDOM)

<table>
<thead>
<tr>
<th>Donor’s project</th>
<th>ALL</th>
<th>SAFE</th>
<th>RISKY</th>
<th>Partner’s project</th>
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<th>risky</th>
<th>safe</th>
<th>risky</th>
<th>risky vs. safe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expected treatment effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1. CHOICE reduces transfers</td>
<td>&lt; 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2. Attributions of responsibility</td>
<td>&lt; 0</td>
<td>= 0</td>
<td>&lt; 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3. Choice egalitarianism</td>
<td>&lt; 0</td>
<td>&lt; 0</td>
<td>= 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4. Less sharing of income from risk taking</td>
<td>= 0</td>
<td>&lt; 0</td>
<td>&lt; 0</td>
<td>= 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Estimated causal treatment effects:** |      |      |       |                   |     |       |      |       |                |
| Given transfers (KSh) | -62.2*+ | 18.7 ** | -159.9 *** | -198.2 * | -38.3 |
| **Observations** | 223  | 143  | 40    | 40    | 80    |

Note: ***/**/*/+: significance on the 1/5/10/15% level based on wild bootstrap (999 rep.).
## Results

### Given and expected transfers

<table>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Expected treatment effects:**

**H1.** CHOICE reduces transfers  $< 0$

**H2.** Attributions of responsibility  $< 0$ $= 0$ $< 0$

**H3.** Choice egalitarianism  $< 0$ $< 0$ $= 0$

**H4.** Less sharing of income from risk taking  $= 0$ $< 0$ $< 0$ $= 0$

**Estimated causal treatment effects:**

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<tr>
<th>Given transfers (KSh)</th>
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<th>18.7</th>
<th>-159.9 $^{**}$</th>
<th>-198.2 $^*$</th>
<th>-38.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected transfers (KSh)</td>
<td>-71.3 $^{**}$</td>
<td>-13.5</td>
<td>-101.8 $^*$</td>
<td>-244.8 $^{**}$</td>
<td>-143.0</td>
</tr>
</tbody>
</table>

*Observations*  223  143  40  40  80

Note: $***/**/*/+$: significance on the 1/5/10/15% level based on wild bootstrap (999 rep.).
Conclusion

Free choice of risk exposure reduces transfers to worse-off partners:

- Reduction of transfers in CHOICE is
  - limited to donors who prefer the risky project
  - independent of partner’s choice of project

- Explanation for reduced transfers:
  - rejection of attributions of responsibility or choice egalitarianism
  - risk takers seem to feel less obliged to share payoff from risky option but also expect less support if project fails (in line with D’Exelle/Verschoor 2015)

Policy implications:

- Anticipating interactions of formal policies with informal insurance:
  - Promotion of entrepreneurship/risky, profitable investments: negative effects on overall solidarity depend on share of individuals who take up these risky opportunities
Thank you very much for your attention!
### Identification

**Characteristics of participants**

Table 1: Basic characteristics of participants by treatment and project

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Random</th>
<th>Choice</th>
<th>Difference</th>
<th>Safe</th>
<th>Random</th>
<th>Difference</th>
<th>Safe</th>
<th>Risky</th>
<th>Difference</th>
<th>Safe</th>
<th>Risky</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td>30.5</td>
<td>31.4</td>
<td>0.90</td>
<td>30.1</td>
<td>30.8</td>
<td>0.70</td>
<td>31.2</td>
<td>32.1</td>
<td>0.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0.33</td>
<td>0.35</td>
<td>0.02</td>
<td>0.30</td>
<td>0.35</td>
<td>0.35</td>
<td>0.05</td>
<td>0.32</td>
<td>0.48</td>
<td>0.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schooling</td>
<td>11.5</td>
<td>11.2</td>
<td>-0.30</td>
<td>11.2</td>
<td>11.9</td>
<td>0.70</td>
<td>3/50 variables significant on the 10% level</td>
<td>11.3</td>
<td>11.2</td>
<td>-0.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>0.45</td>
<td>0.48</td>
<td>0.03</td>
<td>0.43</td>
<td>0.47</td>
<td>0.03</td>
<td>0.46</td>
<td>0.57</td>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Occupational status**

<table>
<thead>
<tr>
<th></th>
<th>Random</th>
<th>Choice</th>
<th>Difference</th>
<th>Safe</th>
<th>Random</th>
<th>Difference</th>
<th>Safe</th>
<th>Risky</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed</td>
<td>0.13</td>
<td>0.14</td>
<td>0.01</td>
<td>0.15</td>
<td>0.10</td>
<td>-0.05</td>
<td>0.13</td>
<td>0.17</td>
<td>0.05</td>
</tr>
<tr>
<td>Self-employed</td>
<td>0.19</td>
<td>0.27</td>
<td>0.08</td>
<td>0.15</td>
<td>0.23</td>
<td>0.08</td>
<td>0.25</td>
<td>0.35</td>
<td>0.10</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0.50</td>
<td>0.45</td>
<td>-0.05</td>
<td>0.50</td>
<td>0.50</td>
<td>0.00</td>
<td>0.46</td>
<td>0.39</td>
<td>-0.07</td>
</tr>
<tr>
<td>Other</td>
<td>0.18</td>
<td>0.14</td>
<td>-0.04</td>
<td>0.20</td>
<td>0.17</td>
<td>-0.03</td>
<td>0.16</td>
<td>0.09</td>
<td>-0.07</td>
</tr>
</tbody>
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**Social preferences**

<table>
<thead>
<tr>
<th></th>
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<th>Choice</th>
<th>Difference</th>
<th>Safe</th>
<th>Random</th>
<th>Difference</th>
<th>Safe</th>
<th>Risky</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inequality aversion 1 (disadv.)</td>
<td>0.18</td>
<td>0.20</td>
<td>0.03</td>
<td>0.23</td>
<td>0.12</td>
<td>-0.12*</td>
<td>0.19</td>
<td>0.26</td>
<td>0.07</td>
</tr>
<tr>
<td>Inequality aversion 2 (adv.)</td>
<td>0.24</td>
<td>0.32</td>
<td>0.08</td>
<td>0.30</td>
<td>0.18</td>
<td>-0.12</td>
<td>0.31</td>
<td>0.39</td>
<td>0.09</td>
</tr>
<tr>
<td>Fairness</td>
<td>0.32</td>
<td>0.34</td>
<td>0.02</td>
<td>0.32</td>
<td>0.32</td>
<td>0.00</td>
<td>0.35</td>
<td>0.30</td>
<td>-0.04</td>
</tr>
<tr>
<td>Trust</td>
<td>0.13</td>
<td>0.19</td>
<td>0.07</td>
<td>0.15</td>
<td>0.10</td>
<td>-0.05</td>
<td>0.21</td>
<td>0.13</td>
<td>-0.08</td>
</tr>
<tr>
<td>Risk preference</td>
<td>3.42</td>
<td>3.59</td>
<td>0.18</td>
<td>3.47</td>
<td>3.37</td>
<td>-0.10</td>
<td>2.99</td>
<td>6.09</td>
<td>3.10***</td>
</tr>
</tbody>
</table>

**Observations**               | 120    | 118    | 60         | 60   | 95     | 23         |

Note: */**/*** indicates significance on the 10/5/1% level.

- randomization of treatments: 2/50 variables significant on the 10% level
- randomization of projects in RANDOM: 3/50 variables significant on the 10% level
Did we measure preferred projects correctly?

Tests

Correlation between actual and preferred projects in RANDOM

<table>
<thead>
<tr>
<th></th>
<th>Assigned</th>
<th>Preferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISKY Project</td>
<td>.500</td>
<td>.242</td>
</tr>
<tr>
<td>(1) Difference</td>
<td>T-test</td>
<td>P-value</td>
</tr>
<tr>
<td></td>
<td>.258</td>
<td>(.000)</td>
</tr>
<tr>
<td>(2) Correlation</td>
<td>Pearson</td>
<td>P-value</td>
</tr>
<tr>
<td></td>
<td>.097</td>
<td>(.290)</td>
</tr>
</tbody>
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Comparison of characteristics of individuals who prefer the same project across treatments

- Individuals preferring the SAFE project: 3/50 variables significant (10%)
- Individuals preferring the RISKY project: 2/50 variables significant (5%)
Did we measure preferred projects correctly?

Tests

- Auxiliary experiment: incentivized choice of project with third subject pool
  - Comparison of characteristics (RANDOM vs. Auxiliary) of individuals with same preferred project: 2/50 variables significant (10%)

- Distribution of projects by treatment:

<table>
<thead>
<tr>
<th></th>
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<th>RANDOM Preferred</th>
<th>CHOICE Assigned</th>
<th>CHOICE Preferred</th>
<th>Auxiliary</th>
<th>Diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) N   %</td>
<td>(2) N   %</td>
<td>(3) N   %</td>
<td>(4) N   %</td>
<td>(3)-(2)</td>
<td>(4)-(2)</td>
</tr>
<tr>
<td>SAFE</td>
<td>60 50.0</td>
<td>91 75.8</td>
<td>95 80.5</td>
<td>86 77.5</td>
<td>4.7</td>
<td>1.6</td>
</tr>
<tr>
<td>RISKY</td>
<td>60 50.0</td>
<td>29 24.2</td>
<td>23 19.5</td>
<td>25 22.5</td>
<td>(.38)</td>
<td>(.77)</td>
</tr>
<tr>
<td>N</td>
<td>120</td>
<td>120</td>
<td>118</td>
<td>111</td>
<td></td>
<td></td>
</tr>
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