PSYCHOLOGICAL TRAUMA, SKILLS AND INCOME: EVIDENCE FROM YOUNG VICTIMS OF VIOLENCE

Andrés Moya - Universidad de los Andes
Suzanne Duryea - IDB
Carolina González-Velosa - IDB
Summary

- We study young victims of violence enrolled in a job-training program in Colombia.

- We find strong patterns of association between the symptoms of trauma and skill deficiencies and labor market outcomes.

- Evidence is consistent with underlying psychological channel: trauma overloads stress-response system.

- Results suggest rethinking standard strategies to assist victims.
Jobs & Development

- Young people face difficulties to access quality jobs in developing countries (ILO 2012 & 2013).

- Key Policy Question: how to improve labor market access and incomes for vulnerable youth?

- Latin America: job-training programs are the most frequent intervention (Gonzalez-Velosa et al., 2012).

- … with limited impacts

Jobs & Development

- Null or even negative effects are not surprising
  - Magnitude of skill deficiencies outweighs programs’ design and per capita investments

- Key implication: interventions for vulnerable youth should be designed according to skill deficiencies
  (Urzúa & Puentes, 2010; Gonzalez-Velosa et al., 2012)

- We require a better understanding of:
  - Cognitive and socioemotional skill deficiencies of vulnerable youth
  - How their vulnerability affects skill formation and program effectiveness.
Our context: violence in Colombia

- Over 8 million victims
- Forced displacement drives victims into chronic poverty.
  - Massive loss of physical, social, and human assets (Ibáñez and Moya, 2010)
  - Psychological trauma & behavioral effects (Moya, 2018; Moya and Carter, 2018)

- 2012 “Victims Law”:
  - Humanitarian assistance
  - Socioeconomic Reparation (job-training programs)
    - Mental health programs
Transfórmate: job training program for young victims

- Full scholarships from the Ministry of Labor
- Approximately 3 semesters (600 hours)
- Prior to the technical training, students receive a module of training in soft skills (200 hours)
Cognitive and Socioemotional Skills

- “Set of attributes needed to navigate across life situations and jobs that are increasingly complex”
La estrategia del Sena para formar a los guerrilleros de las Farc

Director del Sena habló sobre cómo será el proceso educativo en los puntos transitorios de las Farc.

Por: SIMÓN GRANJA |
© 22 de febrero de 2017

La propuesta consiste en formarlos en competencias blandas –liderazgo, trabajo en equipo, responsabilidad, creatividad, honestidad y otras- y ciudadanas, en conocimientos técnicos y tecnológicos. Es decir, competencias para el escenario laboral.
Soft skills for vulnerable populations

Can we “teach” these skills to vulnerable populations?
Conceptual Framework: trauma and skills

- Psychological trauma erodes skills through a series of physiological processes (Smith and Vale, 2006; Yehuda, 2009; McEwen and Sapolsky, 1995)

- Key channel: biological stress response system (Hypothalamic-Pituitary-Adrenal axis)

- Violence overloads the HPA and interferes with cognitive and socioemotional functioning.
HPA axis in response to normal levels of stress

- Corticotropin-releasing factor stimulates the production of corticotropin
- Corticotropin stimulates the production of cortisol from adrenal cortex.
- Cortisol plays a key role in biologic regulation
  - Inhibits the release of corticotropin from the pituitary and of CRF from the hypothalamus.
  - Contains many stress-activated biologic reactions.
Toxic stress overloads HPA

- Production of cortisol is inhibited, resulting in high levels of corticotropin-releasing factor
- Ability to regulate stress is diminished:
  - Increased sensitivity of the negative-feedback system of the HPA axis
  - Severely affects pre-frontal cortex
  - Hinders cognitive and socioemotional processes and executive functions

Yehuda, R. *Encyclopedia of Neuroscience*, 2009
Two questions

1. Impact of **Transfórmate** / soft skill training module

2. Role of psychological trauma on:
   - Skill deficiencies
   - Performance in the program and in the labor market
Two questions

1. Impact of Transfórmate / soft skill training module

2. Role of psychological trauma on:
   - Skill deficiencies
   - Performance in the program and in the labor market
Data

- 807 Transfórmate participants ages 17-29 in 9 different municipalities.
  - Municipalities represent +60% of total student population
- Computerized toolkit for cognitive and socioemotional assessment (IDB, 2015)
- Symptoms of psychological trauma (PTSD - Civilian Checklist)
Data

- 807 Transfórmate participants ages 17-29 in 9 different municipalities.
  - Municipalities represent +60% of total student population

- Computerized toolkit for cognitive and socioemotional assessment (IDB, 2015)

- Symptoms of psychological trauma (PTSD - Civilian Checklist)

- Administrative data:
  - Performance in the program
  - Labor market outcomes (PILA)
Symptoms of Trauma & Critical Thresholds

kernel = epanechnikov, bandwidth = 2.6239
Symptoms of Trauma & Critical Thresholds

kernel = epanechnikov, bandwidth = 2.6239
Skills & Psychological Trauma (PTSD)

- Self Esteem
- Impulse Control
- Perseverance
- External Locus of Control
- Fluid Intelligence (Raven)
- Empathy (Reading the Mind)
Regression analysis (1): trauma and skills

\[ \theta_{it} = \gamma_0 + \gamma_1 Z_{it} + \bar{X}' \Gamma + \epsilon_i \]

- \( \theta_{it} \): Skill of individual \( i \) at time \( t \)
- \( Z_{it} \): PTSD zscore (symptoms of trauma) at time \( t \)
- \( \bar{X} \): Matrix of individual demographic controls
- \( \epsilon_i \): RomanoWolf adjusted error
Regression analysis (2): trauma and program/labor market outcomes

\[ y_{it+1} = \gamma_0 + \gamma_1 Z_{it} + \overline{X'T} + \varepsilon_i \]

- \( y_{it+1} \) — Program/Labor Market Outcome for individual i at time t
- \( Z_{it} \) — PTSD zscore (symptoms of trauma) at time t
- \( \overline{X} \) — Matrix of individual demographic controls
- \( \varepsilon_i \) — RomanoWolf adjusted error
## Psychological trauma associated with lower skills

<table>
<thead>
<tr>
<th></th>
<th>Self Esteem(^1)</th>
<th>Impulse Control(^2)</th>
<th>Perseverance(^3)</th>
<th>External Locus of Control(^4)</th>
<th>Fluid Intelligence(^5)</th>
<th>Empathy(^6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-score</td>
<td>-0.334***</td>
<td>-0.471***</td>
<td>-0.296***</td>
<td>0.269***</td>
<td>-0.0905***</td>
<td>-0.120**</td>
</tr>
<tr>
<td></td>
<td>(0.0178)</td>
<td>(0.0172)</td>
<td>(0.0271)</td>
<td>(0.0371)</td>
<td>(0.0144)</td>
<td>(0.0420)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.700**</td>
<td>-0.677**</td>
<td>-0.172</td>
<td>0.410*</td>
<td>1.030***</td>
<td>0.134</td>
</tr>
<tr>
<td></td>
<td>(0.250)</td>
<td>(0.282)</td>
<td>(0.258)</td>
<td>(0.185)</td>
<td>(0.105)</td>
<td>(0.206)</td>
</tr>
<tr>
<td>Observations</td>
<td>786</td>
<td>791</td>
<td>785</td>
<td>806</td>
<td>806</td>
<td>806</td>
</tr>
<tr>
<td>Controls</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.141</td>
<td>0.248</td>
<td>0.109</td>
<td>0.127</td>
<td>0.131</td>
<td>0.056</td>
</tr>
</tbody>
</table>

1. Self-acceptance based on achievements, personal perception and social comparison scale (Rosenberg, 1980)
2. Ability to control one’s actions when faced with temptation (Tagney et al, 2004)
3. Persistence in achieving a goal despite difficulty (Duckworth et al, 2007)
4. Individuals’ belief on whether the determinants of his/her life are mostly internal or external (Rotter, 1966)
5. Fluid intelligence measure (Raven, 1962)
6. Measure of “Theory of Mind”: the ability to attribute mental states to oneself (Baron-Cohen, 2001)
... lower performance in job-training program

<table>
<thead>
<tr>
<th></th>
<th>Performance in the program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Graduated</td>
</tr>
<tr>
<td></td>
<td>[1]</td>
</tr>
<tr>
<td>Z-score</td>
<td>-0.026*</td>
</tr>
<tr>
<td></td>
<td>[0.013]</td>
</tr>
<tr>
<td>Constant</td>
<td>0.519***</td>
</tr>
<tr>
<td></td>
<td>[0.151]</td>
</tr>
<tr>
<td>Controls</td>
<td>YES</td>
</tr>
<tr>
<td>R2</td>
<td>0.03</td>
</tr>
<tr>
<td>Observations</td>
<td>787</td>
</tr>
</tbody>
</table>

* p<0.1; ** p<0.05; *** p<0.01

- 1 s.d increase in symptoms of PTSD:
  - 5% reduction in likelihood of graduating
  - 14% reduction in hours attended
... lower likelihood of formal employment

<table>
<thead>
<tr>
<th>Months after program's end-date</th>
<th>One Month</th>
<th>Six Months</th>
<th>Twelve Months</th>
<th>Eighteen Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zscore</td>
<td>-0.024**</td>
<td>-0.028*</td>
<td>-0.022</td>
<td>-0.027**</td>
</tr>
<tr>
<td></td>
<td>[0.012]</td>
<td>[0.015]</td>
<td>[0.024]</td>
<td>[0.012]</td>
</tr>
<tr>
<td>Constant</td>
<td>0.439***</td>
<td>0.558***</td>
<td>0.455***</td>
<td>0.509***</td>
</tr>
<tr>
<td></td>
<td>[0.144]</td>
<td>[0.157]</td>
<td>[0.146]</td>
<td>[0.176]</td>
</tr>
<tr>
<td>Controls</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.03</td>
<td>0.04</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Observations</td>
<td>597</td>
<td>597</td>
<td>597</td>
<td>597</td>
</tr>
</tbody>
</table>

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

- 1 s.d increase in symptoms of PTSD:
  - 5% lower likelihood of working in formal sector
... lower monthly wages

<table>
<thead>
<tr>
<th>Months after program's end-date</th>
<th>One Month</th>
<th>Six Months</th>
<th>Twelve Months</th>
<th>Eighteen Months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[1]</td>
<td>[2]</td>
<td>[3]</td>
<td>[4]</td>
</tr>
<tr>
<td>Z-score</td>
<td>-8.557**</td>
<td>-8.624*</td>
<td>-8.656</td>
<td>-10.077*</td>
</tr>
<tr>
<td></td>
<td>[3.450]</td>
<td>[4.661]</td>
<td>[5.892]</td>
<td>[5.838]</td>
</tr>
<tr>
<td>Constant</td>
<td>30.185</td>
<td>63.255*</td>
<td>42.749</td>
<td>117.730***</td>
</tr>
<tr>
<td></td>
<td>[26.911]</td>
<td>[35.834]</td>
<td>[44.687]</td>
<td>[45.465]</td>
</tr>
<tr>
<td>Controls</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>R²</td>
<td>0.01</td>
<td>0.02</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Observations</td>
<td>597</td>
<td>597</td>
<td>597</td>
<td>597</td>
</tr>
</tbody>
</table>

* p<0.1; ** p<0.05; *** p<0.01

- 1 s.d increase in symptoms of PTSD:
- 8-10% lower monthly wages
We cannot talk about causal effects

1. Skill formation is driven by auto-productivity and dynamic complementarity (Cunha and Heckman, 2007).
   - Skills at time $t$ depend on symptoms of trauma at time $t$, but also on previous skills
     \[ \theta_t^s = f^n(\tau_t, \theta_{it-1}^s) \]

2. Higher levels of Coping Self Efficacy enable individuals to endure a traumatic shock and to recover quickly from it (Johnson, 2003).
   - Susceptibility to trauma is a function of the shock of violence and of the available psychological resources.
     \[ \tau_t = f^n[\nu_{t-1}(\text{time, severity}), \theta_{it-1}^s] \]
   - Since we do not observe $\theta_{it-1}^s$, results above overestimate the true effect of trauma
     \[ \hat{\gamma}_1 = \gamma_1 + \text{cov}(\tau_t, \varepsilon_m(\theta_{it-1}^s)) \]
Discussion

- Patterns of association between trauma and skills are important by themselves
  - All subjects experienced violence at some point in their lives
  - Considerable heterogeneity both in symptoms of trauma
  - Relative to other non-victimized populations, likely to have greater skill deficiencies

- Results suggest the need to rethink strategies to promote socioeconomic recovery of victims
  - Bring in rigorous mental health programs into consideration
# Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Esteem</td>
<td>Self-acceptance based on achievements, personal perception and social comparison scale</td>
<td>Rosenberg, 1980</td>
</tr>
<tr>
<td>Impulse Control</td>
<td>Ability to control one’s inner responses or refrain from acting on them</td>
<td>Tagney et al, 2004</td>
</tr>
<tr>
<td>Perseverance</td>
<td>Persistence in achieving a goal despite difficulty</td>
<td>Duckworth et al, 2007</td>
</tr>
<tr>
<td>External Locus of Control</td>
<td>Individuals’ belief on whether the determinants of his/her life are mostly internal or external</td>
<td>Rotter, 1966</td>
</tr>
<tr>
<td>Raven</td>
<td>Fluid intelligence measure</td>
<td>Raven, 1962</td>
</tr>
<tr>
<td>Reading the Mind</td>
<td>Measure of &quot;Theory of Mind&quot;: the ability to attribute mental states to oneself</td>
<td>Baron-Cohen, 2001</td>
</tr>
</tbody>
</table>
## Data

<table>
<thead>
<tr>
<th>Test/Scale</th>
<th>Number of items</th>
<th>Average</th>
<th>Deviation</th>
<th>Estimated Alpha *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Esteem</td>
<td>10</td>
<td>3.39</td>
<td>0.37</td>
<td>0.72</td>
</tr>
<tr>
<td>Impulse Control</td>
<td>13</td>
<td>3.11</td>
<td>0.74</td>
<td>0.70</td>
</tr>
<tr>
<td>Perseverance</td>
<td>12</td>
<td>3.11</td>
<td>0.58</td>
<td>0.68</td>
</tr>
<tr>
<td>External Locus of Control</td>
<td>14</td>
<td>1.73</td>
<td>0.16</td>
<td>0.57</td>
</tr>
<tr>
<td>Reading the Mind</td>
<td>37</td>
<td>0.60</td>
<td>0.12</td>
<td>0.60</td>
</tr>
</tbody>
</table>

Note: * is a reference to the estimated alpha standardized coefficient, calculated based on estimated correlations between items and not their covariances.