Annex

02

Construction of indexes

Social capital and community action: do they contribute to the resilience of vulnerable territories in Paraguay during the COVID-19 pandemic?

Claudia Montanía, Cristhian Parra, Gustavo Setrini, Mónica Ríos

Contents

Assigning scores to responses

To evaluate the preliminary hypotheses and some additional relationships, indexes are calculated by assigning scores to the responses of the individuals who completed the survey. All the questions referred to in this section correspond to the Social Capital, Vulnerability and Collective Action Survey detailed in Annex N° 1. The procedure used to calculate the scores and indexes is detailed below.

Bonding Social Capital Index (interpersonal networks and trust):

Bonding social capital index score (cs_f_i=[0...26])

a. Add 1 point for each yes answer to B1 and B4 ([0...7]).

b. Add 2 points for each yes answer to question B2([0...14])

c. Add points based on the position of the answers B3 in relation to the 3 quartiles of the distribution of measurements reported to this question, following the guide table below([0...4]):

Value = 0	0
Value <= Q1	1
Value <= Q2	2
Value <= Q3	3
Value > Q3	4

Bridging social capital index

Bridging Social Capital Index Score (cs_c_i=[0...32])

d. Add 1 point for each yes answer to questions B5 and B8 ([0...9])

e. Add 2 points for each yes answer to question B6([0...18])

f. Add points based on the position of the B7 responses in relation to the 3 quartiles of the distribution of measures reported to this question, following the guideline table below([0...4]):

Value = 0	0
Value <= Q1	1
Value <= Q2	2
Value <= Q3	3
Value > Q3	4

Linking social capital index

Linking social capital index score ***(cs_vi=0...51)***

g. Add 1 point for each yes answer to questions B9 ([0,1]).

h. Add 2 points for each yes answer to question B10 ([0,2]).

i. Add points based on the position of the answers to the options of question B12 (B12.1, B12.2, B12.3, B12.4) in relation to the 3 quartiles of the distribution of measurements reported to this question, following the guide table below ([0...32]):

Value = 0	0
Value <= Q1	2
Value <= Q2	4
Value <= Q3	6
Value > Q3	8

j. Add points based on the position of the answers to the options in question B11 (B11.1, B11.2, B11.3, B11.4) in relation to the 3 quartiles of the distribution of measures reported to this question, following the guide table below ([0...16]):

Value = 0	0
Value <= Q1	1
Value <= Q2	2
Value <= Q3	3
Value > Q3	4

Interpersonal and institutional trust indexes

For trust questions, the scale is translated into one of the following options, depending on whether the question is in the negative or positive direction

Response Label	Response Code	Values in Negative Questions	Values in Positive Questions
Yes, Strongly Agree	1	-2	2
Yes, Agree	2	-1	1
Neither Agree nor Disagree	3	0	0
No, Disagree	4	1	-1
No, Strongly Disagree	5	2	-2
NR/UNK	99	0	0

Interpersonal trust score

(conf_inter_i=[-6…6])

a. Add the points corresponding to the answers to questions C1, C2 and C3, using the positive or negative scale as indicated in the following table.

Question	Scale Type
C1	Negative
C2	Negative
C3	Positive

Institutional confidence score

(conf_insti=-18...18)

a. Add the points corresponding to the answers to questions C4, C5, C6, C7, C8, C9, C10, C11, C12, using the positive or negative scale as indicated in the following table.

Question	Scale Type
C4	Negative
C5	Negative
C6	Positive
C7	Positive
C8	Negative
C9	Positive
C10	Positive
C11	Negative
C12	Negative

Economic Vulnerability Index

Partial score of economic vulnerability according to Galeano $(vuln_i=[0…16.21])$: add questions D1, D2 and D3 according to the following criteria, to partially calculate economic vulnerability according to part of the questionnaire proposed by Galeano in his book *Territorios de Exclusión Social* (Territories of Social Exclusion).

a. Perform a PCA between the answer options of D1 and assign the weight obtained for each option to each respondent's answer ([0...2.21]).

b. Add points for each option marked in questions D2 ([0...6]) and D3 ([0...3]) according to the following scale of points for each label.

c. Add points for each option checked in question A7 ([0,..5]) according to the following scale of points for each label.

Labels in question D2	Response Code	Value to add
ESSAP	1	0
2. Sanitation Board or SENASA	2	0
3. Community network	3	1
4. Private network or provider	4	1
5. Artesian well	5	2
6. Well with pump	6	3
7.Well without pump	7	4
8.Spring	8	4
9.*Tajamar*, river, stream	9	5
10.Rainwater	10	6
11.*Aguatero*	11	6

Labels in question D2	Response Code	Value to add
12.Other source ..... Specify	12	0
Labels in question D3	Response Code	Value to add
Collected by public or private truck	1	0
Burn	2	2
Dumps in a stream	3	2
Dump in the yard or on the farm	4	3
Dumps in ditch, creek, river	5	2
Collect in a cart	6	1
Other.....Specify	7	2 (provisional)
Tags in question A7	Response Code	Value to add
Working	1	0
Looking for a job	2	3
Studying	3	2
Receiving a pension	4	1
Doing housework	5	4
Permanent disability, no pension	6	5
Receiving a pension	7	2
Performing charitable activities without remuneration	8	2
Other specify	9	0 (provisional)

Collective action index for community action

Collective action score for community action ($ac\_com_i=[0…3]$)

a. Add 1 point for each yes to questions E1 ([0,1])

b. Add 2 points for each yes answer to questions E2 ([0,2])

The collective action for community action score is calculated according to the following criteria ($ac\_{}_{comunitaria\_colectiva}=[0…18]$)

a. Add 1 point for each yes answer to questions F2, F4, F5, F9, F13, F14 ([0...6]).

b. Add points according to the following table of values for the answers to the questions F3, F6, F15 ([0...12])

Question tags F3, F6, F15	Response Code	Value to Add
Less than one year	1	1
1 to 3 years	2	2
More than 3 years to 5 years	3	3
More than 5 years	4	4
NR/UNK	99	0

Collective action index for civic demands

Collective action score for civic demands ($ac\_dem_i=[0…3]$)

a. Add 1 point for each yes answer to questions E3 ([0,1])

b. Add 2 points for each yes answer to the questions E4 ([0,2])

Collective Asset Access Index

The collective asset score is calculated according to the following criteria ($commons_i=[0…19]$)

a. Add 1 point for each Yes answer to questions F1, F7, F8, F10, F12 (only if F13 is Yes), F16, F17, F18 ([0...13])

b. In the case of F7.5 answers, code and present their unified frequency.

c. Add points according to the following table of values for the answers to questions F11 (only if F10=1) AND F19 (only if F18=1)

Labels in question F11 ([-1...3]) and F19 ([-1...3])	Response Code	Value to Add
Every day of the week	1	3
Three times a week	2	2
Twice a week	3	1
Once a week	4	0
I did not use it this week, but previously I did use it.	5	-1
Never used it.	6	0
NR/UNK	99	0

Public Institutional Response Index

Public Institutional Response Score ($R\_pub_i=[0…10]$)

a. Add 1 point for each Yes answer to questions E7 ([0,1])

b. Add 1 point for each marked option other than NR/UNK or No in questions E7.1 ([0…5]) and E8 ([0…4]).

Civilian Institutional Response Index

Civilian Institutional Response Score ($R\_civ_i=[0…1]$)

a. Add 1 point for each Yes answer to questions E9….1.

Private Institutional Response Index

Private Institutional Response Score ($R\_priv_i=[0…1]$)

a. Add 1 point for each Yes response to questions E10

Consistency of calculated indexes

The indexes for measuring the interrelationships of our causal chain were constructed by summing the scores obtained for a series of questions. To evaluate their consistency, we calculated Cronbach's Alpha (Cronbach, 1951). This calculation allows us to identify whether the items or questions considered within each index are measuring the same concept or construct. Generally speaking, George and Mallery (2019, p. 231) recommend interpreting the values of Cronbach's Alpha coefficients as follows:

Alpha > 0.9 to 0.95 is excellent.

Alpha > 0.8 is good

Alpha > 0.7 is acceptable

Alpha > 0.6 is questionable

Alpha > 0.5 is poor

Alpha <0.5 is unacceptable.

Within a standard exploratory analysis, a value around 0.7 is adequate and is the minimum accepted level (Nunnally and Bernstein, 1994). However, in the early stages of an exploratory study, an internal consistency of 0.6 or 0.5 may be considered sufficient (Nunnally, 1967).

Preliminary results of the calculations are presented in Table 2. They show that in most cases, internal consistency is sufficient for the early stages of an exploratory study, indicating that the indexes are constructed on the basis of questions or items that measure the same type of construct or concept. Although insufficient results are obtained for interpersonal trust, public institutional response and vulnerability, it should be considered that Cronbach's Alpha indicates the existence of internal consistency and interrelation, but does not indicate the degree of unidimensionality of the items measuring the construct. Therefore, it is possible that, for the indexes with insufficient results, there are cases of multidimensionality in the measure, which does not mean that they are not appropriate for measuring the phenomenon.

Table 2: Cronbach's Alpha results for the constructed indexes

Indexes	Questions	Cronbach Alpha	Early stages of an exploratory study
Bonding Social Capital	B1, B2, B3, B4	0.6467 (questionable)	Sufficient
Bridging Social Capital	B5, B6, B7, B8	0.7646 (acceptable)	Sufficient
Linking Social Capital	B9, B10, B11, B12	0.6679 (questionable)	Sufficient
Interpersonal Trust	C1, C2, C3	0.2348 (unacceptable)	Insufficient
Institutional Trust	C4, C5, C6, C7, C8, C9, C10, C11, C12	0.6839 (questionable)	Sufficient
Collective action for community action	E1, E2	0.8010 (good)	Sufficient
Collective action associated with collective assets	F2, F3, F4, F5, F6, F9, F13, F14, F15	0.6537 (questionable)	Sufficient
Collective action for civic demands	E3, E4	0.8284 (good)	Sufficient
Public institutional response	E7, E8	0.1047 (unaccepable)	Insufficient
Private institutional response	E9	--	--
Civil institutional response	E10	--	--
Vulnerability	D1, D2, D3, A7	0.2471 (unacceptable)	Insufficient

Source: AccLabPY

laboratorios de aceleración

UNDP Paraguay Accelerator Lab

Our mission is to accelerate economic formalization, participatory governance and the accumulation of innovation capacity across sectors in Paraguay.

Contact
https://www.undp.org/es/acclabpy
https://www.researchgate.net/profile/Pnud-Paraguay
accel.labs.py@undp.org