

Online Appendix

How Research Affects Policy:

Experimental Evidence from 2,150 Brazilian Municipalities

Jonas Hjort

Columbia University
& BREAD & CEPR
& NBER

Diana Moreira

U.C. Davis

Gautam Rao

Harvard University
& NBER

Juan Francisco Santini

Innovations for Poverty Action

**TABLE A.1: BELIEFS EXPERIMENT:
SELECTION INTO THE EXPERIMENT - MAYORS**

Variables	Mean Non-Participants	Δ Participants	P-Value
<i>Mayors' Characteristics</i>			
Male	87.19	3.09	0.25
Age	48.61	-0.55	0.54
College	52.04	3.11	0.47
2nd Term	22.07	-3.02	0.37
Electoral Margin Victory	14.99	-1.69	0.15
Leftist Political Party	38.42	7.14	0.09
<i>Municipalities' Characteristics</i>			
Population	20.89	-2.75	0.31
College Population	4.09	-0.13	0.40
Public Adm College	32.25	0.04	0.97
Poverty	34.15	0.26	0.73
Gini	51.19	0.00	0.99
Per Capita Income	378.03	-4.30	0.65
Kids in School (0-3)	19.84	0.40	0.66
Kids in School (4-5)	83.30	-1.09	0.30
Joint F-test			0.43

Note: Sample means of the mayors that did not participate in the beliefs experiment and differences in means with respect to participants. Differences in means were calculated including conference fixed effects. We restrict the analysis to the 12 regional conferences for which CNM shared the list of attendees. There were 367 mayors that did not participate in the beliefs experiment and 224 that did participate. The first block of variables reports characteristics of the mayor that runs the municipality. Leftist Political Party (= 1 for mayors belonging to a center-leftist party according to historical political platforms, 0 otherwise). The second block of variables reports characteristics of the municipality. Population is the municipality's number of inhabitants (in thousands). College Population is the municipality's share of adults with college degrees. Public Administration College is the share of municipal public employees with college degrees. Poverty is the municipality's poverty rate. Gini is the municipality's Gini coefficient. Per Capita Income is the municipality's monthly income per capita. Kids in School (0-3) is the share of kids 0-3 years old in the municipality that attend pre-school education. Kids in School (4-5) is the share of kids 4-5 years old in the municipality that attend pre-school education. Joint significance F-test is reported.

**TABLE A.2: BELIEFS EXPERIMENT:
PRIOR BELIEFS**

Beliefs About	Mean	SD	Effect Size in Study
Own Municipality	0.42	(0.22)	-
123; Michigan	0.45	(0.22)	0.87
130; Jamaica	0.42	(0.21)	0.91
1420; Colombia	0.37	(0.19)	0.26
4667; USA	0.50	(0.22)	0.15

Note: Sample mean and standard deviation of participants' priors. Beliefs About refers to the location about which the prior is asked. The last column reports the effect size described in the corresponding study.

**TABLE A.3: BELIEFS EXPERIMENT:
WILLINGNESS TO PAY: OTHER DETERMINANTS**

LHS Variable	(1) WTP	(2) WTP	(3) WTP	(4) WTP
<i>Mayors' Characteristics</i>				
Male	6.74 (3.16)			6.33 (3.11)
Age	-0.82 (2.10)			-0.93 (2.11)
College	1.12 (2.16)			2.45 (2.21)
2nd Term	1.16 (2.59)			1.47 (2.88)
Margin Victory	1.08 (2.13)			1.45 (2.09)
Leftist Political Party	0.98 (2.15)			0.45 (2.22)
<i>Municipalities' Characteristics</i>				
Population		2.64 (2.22)		2.05 (2.20)
College Population		-0.52 (2.65)		-0.67 (2.68)
Public Adm College		2.09 (2.27)		0.74 (2.29)
Poverty		-1.41 (5.13)		0.32 (5.14)
Gini		-0.61 (2.53)		-0.88 (2.51)
Big South		1.93 (4.94)		4.93 (5.00)
Per Capita Income		-5.21 (4.59)		-3.80 (4.51)
Kids in School (0-3)		1.19 (2.34)		0.74 (2.34)
Kids in School (4-5)		2.31 (2.45)		2.20 (2.41)
<i>ECD Policy Survey Characteristics</i>				
Mayor			-1.07 (2.08)	-0.98 (2.16)
Prof Politician			-0.50 (2.34)	-1.40 (2.49)
Leftist Scale			0.06 (2.50)	0.37 (2.54)
Implemented ECD			11.45 (2.39)	11.90 (2.47)
Heard ECD			6.84 (2.68)	6.89 (2.75)
Observations	2,542	2,573	2,573	2,542
Clusters (Individuals)	754	764	764	754
Mean LHS	44.27	44.62	44.62	44.27

Note: OLS results. The dependent variable is willingness to pay, which is elicited in two different rounds. We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Mayors' characteristics: Male (1/0); Age above-below median (1/0); College (1/0); 2nd term (1/0); Electoral Margin of Victory above-below median (1/0); and Leftist Political Party (1/0, mayors belonging to a center-leftist party according to historical political platforms). Municipalities' characteristics: Population above-below median (1/0); College Population above-below median (1/0); Public Administration College above-below median (1/0); Poverty above-below median (1/0); Gini above-below median (1/0); Big south (1/0, where 1 are south, southeast and mid-west regions; and 0 are north and northeast regions); Per Capita Income above-below median; Kids in School (0-3) above-below median (1/0) of the share of kids 0-3 years old that attend pre-school education; Kids in School (4-5) above-below median (1/0) of the share of kids 4-5 years old that attend pre-school education. ECD Policy Survey characteristics: Mayor (1/0); Professional Politician (1/0); Leftist Scale (1/0); Implemented ECD (1/0) indicates whether the participant reported the municipality implemented a ECD program before; Heard ECD (1/0) indicates whether the participant reported that he/she had heard about ECD programs before. Mean LHS is the mean WTP on the left-hand side of each equation. Robust standard errors clustered at the individual level are in parentheses.

**TABLE A.4: BELIEFS EXPERIMENT:
BELIEF UPDATING: DROPPING INATTENTIVE TYPES & DEALING WITH MEASUREMENT ERROR
(IV)**

LHS Variable	Dropping Inattentive Types			Measurement Error IV	
	(1) Posterior	(2) Posterior	(3) Posterior	(4) Posterior	(5) Posterior
Prior	0.6824 (0.0214)	0.6010 (0.0246)	0.5307 (0.0242)	0.8149 (0.0261)	0.7929 (0.0375)
Signal	0.3230 (0.0194)	0.4118 (0.0218)	0.4631 (0.0206)	0.2381 (0.0251)	0.2532 (0.0311)
Observations	1,240	928	560	438	438
Round	1 and 2	1 and 2	1 and 2	2	2
Beliefs About	Municipality	Municipality	Municipality	Municipality	Municipality
Received Study for Free	No	No	No	Yes	Yes
Instrument Prior	No	No	No	No	Yes
Drops Never Updaters	No	Yes	Yes	No	No
Includes Only $0 < \text{Average Update} < 1$	No	No	Yes	No	No
Clusters (Individuals)	755	544	322	438	438

Note: OLS results (columns 1-4) and 2SLS (column 5). The first three columns compare belief updating for the full sample (Col 1), dropping individuals with average updating weight $\pi = 0$ (Col 2), and keeping only individuals with average updating weight $0 < \pi < 1$ (Col 3). The next two columns report an attempt to deal with measurement error in the priors. Specifically, Col 4 shows the usual updating regression for Round 2. Col 5 instead instruments for the prior in Round 2 using the randomized study signal provided in Round 1. The very similar coefficients on Prior in Cols 4 and 5 suggest measurement error plays a limited role in attenuating the coefficient. In all regressions, the dependent variables are posterior beliefs. Prior is the belief of the respondent about the effect, right before receiving some study. Signal is the received study's effect size. When dealing with a second update in posteriors, the first update is treated as a prior. In the rows below the coefficients, Beliefs About specifies which location the beliefs are elicited for, either the respondent's own municipality or one of the four possible study locations. Received Study for Free indicates whether participant received the information regardless of their WTP. The updating weight π is defined as $(\text{Posterior} - \text{Prior}) / (\text{Signal} - \text{Prior})$, and the average updating weight is defined as the average of π within each individual. Robust standard errors clustered at the individual level are in parentheses.

**TABLE A.5: BELIEFS EXPERIMENT:
BELIEF UPDATING: HETEROGENEOUS EFFECTS - MAYOR CHARACTERISTICS**

LHS Variable	(1) Post	(2) Post	(3) Post	(4) Post	(5) Post	(6) Post	(7) Post	(8) Post	(9) Post
Characteristic		Male	Age	College	2nd Term	Margin Victory	Leftist Scale	Implem ECD	Heard ECD
Prior	0.6747 (0.0301)	0.6985 (0.0817)	0.6232 (0.0436)	0.7575 (0.0480)	0.6961 (0.0335)	0.6754 (0.0428)	0.7034 (0.0362)	0.6561 (0.0422)	0.6710 (0.0338)
Signal	0.3240 (0.0287)	0.3065 (0.1051)	0.3636 (0.0433)	0.2492 (0.0409)	0.3062 (0.0312)	0.3267 (0.0408)	0.2899 (0.0328)	0.3198 (0.0425)	0.3363 (0.0335)
Prior * Characteristic		-0.0278 (0.0880)	0.0982 (0.0591)	-0.1329 (0.0615)	-0.1057 (0.0741)	0.0004 (0.0609)	-0.1043 (0.0649)	0.0461 (0.0603)	0.0023 (0.0740)
Signal * Characteristic		0.0200 (0.1093)	-0.0759 (0.0569)	0.1209 (0.0564)	0.0932 (0.0782)	-0.0071 (0.0581)	0.1248 (0.0654)	0.0011 (0.0574)	-0.0337 (0.0640)
Observations	623	623	623	623	623	614	623	623	623
Respondent	Mayor	Mayor	Mayor	Mayor	Mayor	Mayor	Mayor	Mayor	Mayor
Round	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2
Beliefs About	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality
Received Study for Free	No	No	No	No	No	No	No	No	No
Clusters (Individuals)	377	377	377	377	377	371	377	377	377

Note: OLS results, restricting the sample to mayors. The dependent variables are posterior beliefs, which are declared after successfully buying the results from a study in each round. Prior is the belief of the respondent about the effect, right before buying some study. Signal is the bought study's effect size. When dealing with a second update in posteriors, the first update is treated as a prior. We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Mayors' characteristics included as interactions are: Male (1/0); Age above-below median (1/0); College (1/0); 2nd term (1/0); Electoral Margin of Victory above-below median (1/0); Leftist Scale (1/0); Implemented ECD (1/0) indicates whether the participant reported the municipality implemented a ECD program before; Heard ECD (1/0) indicates whether the participant reported that he/she had heard about ECD programs before. In the rows below the coefficients, Beliefs About specifies which location the beliefs are elicited for, either the respondent's own municipality or one of the four possible study locations. Received Study for Free indicates whether participant received the information regardless of their WTP. Robust standard errors clustered at the individual level are in parentheses.

**TABLE A.6: BELIEFS EXPERIMENT:
BELIEF UPDATING: HETEROGENEOUS EFFECTS - MUNICIPALITY CHARACTERISTICS**

LHS Variable	(1) Post	(2) Post	(3) Post	(4) Post	(5) Post	(6) Post	(7) Post	(8) Post	(9) Post
Characteristic	Pop	College Pop	College Adm	Poverty	Gini	Big South	Income pc	Kids in School 0-3	Kids in School 4-5
Prior	0.7049 (0.0322)	0.6689 (0.0277)	0.6505 (0.0295)	0.6555 (0.0331)	0.6878 (0.0316)	0.7081 (0.0282)	0.7111 (0.0272)	0.7144 (0.0276)	0.7108 (0.0300)
Signal	0.2865 (0.0299)	0.3254 (0.0247)	0.3577 (0.0254)	0.3280 (0.0317)	0.3104 (0.0293)	0.3169 (0.0249)	0.3128 (0.0239)	0.3032 (0.0264)	0.2748 (0.0274)
Prior * Characteristic	-0.0394 (0.0432)	0.0292 (0.0432)	0.0765 (0.0426)	0.0448 (0.0433)	-0.0097 (0.0428)	-0.0563 (0.0430)	-0.0699 (0.0434)	-0.0733 (0.0428)	-0.0495 (0.0426)
Signal * Characteristic	0.0638 (0.0391)	-0.0036 (0.0398)	-0.0856 (0.0392)	-0.0080 (0.0401)	0.0229 (0.0391)	0.0131 (0.0396)	0.0251 (0.0403)	0.0434 (0.0389)	0.0854 (0.0382)
Observations	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240
Respondent	All	All	All	All	All	All	All	All	All
Round	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2
Beliefs About	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality
Received Study for Free	No	No	No	No	No	No	No	No	No
Clusters (Individuals)	755	755	755	755	755	755	755	755	755

Note: OLS results. The dependent variables are posterior beliefs, which are declared after successfully buying the results from a study in each round. Prior is the belief of the respondent about the effect, right before buying some study. Signal is the bought study's effect size. When dealing with a second update in posteriors, the first update is treated as a prior. We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Municipalities' characteristics included as interactions are: Population above-below median (1/0); College Population above-below median (1/0); Public Administration College above-below median (1/0); Poverty above-below median (1/0); Gini above-below median (1/0); Big south (1/0, where 1 are south, southeast and mid-west regions; and 0 are north and northeast regions); Per Capita Income above-below median; Kids in School (0-3) above-below median (1/0) of the share of kids 0-3 years old that attend pre-school education; Kids in School (4-5) above-below median (1/0) of the share of kids 4-5 years old that attend pre-school education. In the rows below the coefficients, Beliefs About specifies which location the beliefs are elicited for, either the respondent's own municipality or one of the four possible study locations. Received Study for Free indicates whether participant received the information regardless of their WTP. Robust standard errors clustered at the individual level are in parentheses.

TABLE A.7: BELIEFS EXPERIMENT:
BELIEF UPDATING: LARGE-SAMPLE AND DEVELOPING-COUNTRY STUDIES - DIFFERENT EFFECT SIZES

LHS Variable	(1) Posterior	(2) Posterior	(3) Posterior	(4) Posterior
Prior	0.5470 (0.0588)	0.4248 (0.0891)	0.6987 (0.0702)	0.5587 (0.1026)
Signal	0.3619 (0.0379)	0.4219 (0.0540)	0.2860 (0.0507)	0.3677 (0.0607)
Prior * Developing	0.0083 (0.0577)	0.0251 (0.0855)	-0.0077 (0.0763)	-0.0606 (0.0948)
Signal * Developing	-0.0110 (0.0424)	-0.0255 (0.0616)	0.0102 (0.0593)	0.0511 (0.0752)
Prior * Large	0.0206 (0.0706)	0.0442 (0.1049)	-0.0467 (0.0930)	0.0834 (0.1217)
Signal * Large	0.3123 (0.0951)	0.3091 (0.1196)	0.4067 (0.1624)	0.1615 (0.1720)
Prior * Long-run	0.1128 (0.0811)	0.1950 (0.1198)	0.0354 (0.0971)	0.1336 (0.1258)
Signal * Long-run	-0.0145 (0.0650)	-0.0669 (0.0930)	0.0338 (0.0850)	-0.0461 (0.0942)
Prior * Developing * Long-run	-0.1068 (0.0898)	-0.2067 (0.1387)	-0.0624 (0.1019)	-0.1214 (0.1299)
Signal * Developing * Long-run	0.1797 (0.0894)	0.3021 (0.1386)	0.1047 (0.1064)	0.2361 (0.1346)
Prior * Large * Long-run	-0.0581 (0.1060)	-0.1725 (0.1526)	0.1354 (0.1227)	-0.1292 (0.1571)
Signal * Large * Long-run	-0.0704 (0.1553)	0.0854 (0.2175)	-0.4099 (0.2032)	0.0469 (0.2541)
Observations	1,131	645	486	493
Round	1 and 2	1	2	1
Beliefs About	Municipality	Municipality	Municipality	Random Study
Received Study for Free	Yes	Yes	Yes	Yes
Clusters (Individuals)	731	645	486	493

Note: OLS results. The dependent variables are posterior beliefs, which are declared after successfully buying the results from a study in each round. Prior is the belief of the respondent about the effect, right before buying some study. Signal is the bought study's effect size. When dealing with a second update in posteriors, the first update is treated as a prior. Developing is a dummy which is = 1 for Jamaica and Colombia, 0 otherwise. Large is a dummy which is = 1 for Colombia and US, 0 otherwise. Long-run is a dummy which is = 1 (0) for the six (eight) conferences in which the informed effect sizes were assessed in adulthood: 0.38 (0.91) for Jamaica, 0.50 (0.87) for Michigan; or just continue to be assessed shortly after the intervention was over: 0.18 (0.15) for USA, 0.26 (0.26) for Colombia. In the rows below the coefficients, Beliefs About specifies which location the beliefs are elicited for, either the respondent's own municipality or one of the four possible study locations. Received Study for Free indicates whether participant received the information regardless of their WTP. Robust standard errors clustered at the individual level are in parentheses.

**TABLE A.8: BELIEFS EXPERIMENT:
VALUATION OF IMPLEMENTATION REPORT**

LHS Variable	OLS	IV
	(1) Implementation Report	(2) Implementation Report
Final Posterior	16.4909 (5.2677)	41.1943 (21.0608)
Observations	737	737
Instrument Final Posterior	No	Yes
Clusters (Individuals)	737	737
Mean LHS	59.72	59.72
SD LHS	33.69	33.69

Note: OLS (column 1) and 2SLS (column 2) results. Dependent variable is willingness to pay for a policy implementation report. Final Posterior is the value of the last updated belief, that being after buying one or two results. In column 2, this last variable is instrumented with either the received signal or the average of the received signals in the case the participant have bought two results. Mean LHS is the average policy implementation report valuation on the left-hand side of each equation. SD LHS is the standard deviation of policy implementation report valuation on the left-hand side of each equation. Robust standard errors clustered at the individual level are in parentheses.

**TABLE A.9: POLICY-ADOPTION EXPERIMENT:
INDIVIDUAL AND MUNICIPAL PREDICTORS OF SESSION PARTICIPATION**

LHS Variable	(1) Information Session	(2) Information Session	(3) Information Session
<i>Mayors' Characteristics</i>			
Male	0.0157 (0.0546)		-0.0014 (0.0560)
Age	-0.0719 (0.0328)		-0.0771 (0.0336)
College	0.1616 (0.0328)		0.1562 (0.0333)
2nd Term	-0.0007 (0.0448)		0.0057 (0.0456)
Electoral Margin Victory	0.0265 (0.0326)		0.0231 (0.0330)
Leftist Political Party	0.0314 (0.0347)		0.0379 (0.0352)
<i>Municipalities' Characteristics</i>			
Population		-0.0079 (0.0343)	-0.0141 (0.0340)
College Population		0.0634 (0.0466)	0.0492 (0.0463)
Public Adm College		-0.0345 (0.0339)	-0.0442 (0.0337)
Poverty		-0.1015 (0.0903)	-0.0753 (0.0926)
Gini		0.0449 (0.0382)	0.0462 (0.0382)
Big South		0.0258 (0.0662)	0.0593 (0.0660)
Per Capita Income		-0.0762 (0.0839)	-0.0663 (0.0854)
Local Tax Revenues (2010-2015)		-0.0245 (0.0459)	-0.0166 (0.0454)
Constant	0.2876 (0.0631)	0.4343 (0.0937)	0.3376 (0.1124)
Observations	874	878	871

Note: OLS results. The dependent variable is information session participation and is = 1 for mayors that attended the information session, 0 otherwise. We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Mayors' characteristics included in the model are: Male (1/0); Age above-below median (1/0); College (1/0); 2nd Term (1/0); Electoral Margin of Victory above-below median (1/0); and Leftist Political Party (1/0, mayors belonging to a center-leftist party according to historical political platforms). Municipalities' characteristics included in the model are: Population above-below median (1/0); College Population above-below median (1/0); College Public Administration employees above-below median (1/0); Poverty above-below median (1/0); Gini above-below median (1/0); Big South (1/0, where 1 are south, southeast and mid-west regions; and 0 are north and northeast regions); monthly Per Capita Income above-below median (1/0); Local Tax Revenues share above-below median (1/0). Robust standard errors clustered at the municipality level are in parenthesis.

**TABLE A.10: POLICY-ADOPTION EXPERIMENT:
POLICY ADOPTION - WITH INDIVIDUAL AND MUNICIPAL COVARIATES: TAX REMINDERS**

LHS Variable	(1) Adopted	(2) Adopted	(3) Adopted	(4) Adopted	(5) Adopted
Information Session	0.1031 (0.0531)	0.1065 (0.0526)	0.1024 (0.0546)	0.1177 (0.0791)	0.1094 (0.0653)
Observations	2,271	2,239	2,027	898	1,341
Respondent	All	All	All	Mayor	Finance Staff
Drops Inattentive	No	No	Yes	No	No
Mayor Characteristics	No	Yes	Yes	Yes	Yes
Municipal Characteristics	No	Yes	Yes	Yes	Yes
Clusters (Municipalities)	1,465	1,447	1,395	898	1,341
Mean Control	0.317	0.314	0.294	0.364	0.280

Note: 2SLS results. The dependent variable is a dummy which is = 1 if respondent says the policy was adopted in municipality, 0 otherwise. Information Session is a dummy which is = 1 if the municipality's mayor attended the information session about tax reminders, 0 otherwise. This last variable is instrumented with treatment assignment. In the rows below the coefficients, Drops Inattentive refers to whether respondents that failed the survey attention check component of the reminders policy are excluded from the model, where the attention check was "The tax reminders sent informed taxpayers that the Brazilian constitution was reformed in 1988". We express all continuous variables as indicators of above-below the median of the distribution of municipalities. Mayors' characteristics included in the model are: Male (1/0); Age above-below median (1/0); College (1/0); 2nd Term (1/0); Electoral Margin of Victory above-below median (1/0); and Leftist Political Party (1/0, mayors belonging to a center-leftist party according to historical political platforms). Municipalities' characteristics included in the model are: Population above-below median (1/0); College Population above-below median (1/0); College Public Administration employees above-below median (1/0); Poverty above-below median (1/0); Gini above-below median (1/0); Big South (1/0, where 1 are south, south-east and mid-west regions; and 0 are north and northeast regions); monthly Per Capita Income above-below median (1/0); Local Tax Revenues share above-below median (1/0). Robust standard errors clustered at the municipality level are in parenthesis.

TABLE A.11: POLICY-ADOPTION EXPERIMENT:
ITT POLICY ADOPTION - WITH INDIVIDUAL AND MUNICIPAL COVARIATES: TAX REMINDERS

LHS Variable	(1) Adopted	(2) Adopted	(3) Adopted	(4) Adopted	(5) Adopted
Treatment Assignment	0.0402 (0.0208)	0.0418 (0.0208)	0.0395 (0.0212)	0.0477 (0.0325)	0.0419 (0.0251)
Observations	2,271	2,239	2,027	898	1,341
Respondent	All	All	All	Mayor	Finance Staff
Drops Inattentive	No	No	Yes	No	No
Mayor Characteristics	No	Yes	Yes	Yes	Yes
Municipal Characteristics	No	Yes	Yes	Yes	Yes
Clusters (Municipalities)	1,465	1,447	1,395	898	1,341
Mean Control	0.317	0.314	0.294	0.364	0.280

Note: OLS results. The dependent variable is a dummy which is = 1 if respondent says the policy was adopted in municipality, 0 otherwise. Treatment Assignment is a dummy which is = 1 if the mayor was assigned to the treatment group, 0 otherwise. In the rows below the coefficients, Drops Inattentive refers to whether respondents that failed the survey attention check component of the reminders policy are excluded from the model, where the attention check was “The tax reminders sent informed taxpayers that the Brazilian constitution was reformed in 1988”. We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Mayors’ characteristics included in the model are: Male (1/0); Age above-below median (1/0); College (1/0); 2nd Term (1/0); Electoral Margin of Victory above-below median (1/0); and Leftist Political Party (1/0, mayors belonging to a center-leftist party according to historical political platforms). Municipalities’ characteristics included in the model are: Population above-below median (1/0); College Population above-below median (1/0); College Public Administration employees above-below median (1/0); Poverty above-below median (1/0); Gini above-below median (1/0); Big South (1/0, where 1 are south, southeast and mid-west regions; and 0 are north and northeast regions); monthly Per Capita Income above-below median (1/0); Local Tax Revenues share above-below median (1/0). Robust standard errors clustered at the municipality level are in parenthesis.

**TABLE A.12: POLICY-ADOPTION EXPERIMENT:
POLICY ADOPTION: HETEROGENEOUS EFFECTS TAX REMINDERS - MAYOR CHARACTERISTICS**

LHS Variable	(1) Adopted	(2) Adopted	(3) Adopted	(4) Adopted	(5) Adopted	(6) Adopted
Characteristic	Male	Age	College	2nd Term	Margin Victory	Leftist Party
Information Session	-0.0544 (0.2007)	0.1648 (0.0666)	0.1481 (0.1051)	0.1084 (0.0588)	0.1445 (0.0758)	0.0700 (0.0691)
Information Session * Characteristic	0.1715 (0.2081)	-0.1263 (0.1065)	-0.0663 (0.1212)	-0.0321 (0.1373)	-0.0802 (0.1065)	0.0913 (0.1072)
Characteristic	0.0077 (0.0483)	0.0241 (0.0287)	0.0081 (0.0293)	0.0149 (0.0398)	0.0126 (0.0287)	-0.0234 (0.0301)
Observations	2,271	2,271	2,271	2,271	2,241	2,271
Respondent	All	All	All	All	All	All
Drops Inattentive	No	No	No	No	No	No
Clusters (Municipalities)	1,465	1,465	1,465	1,465	1,448	1,465
Mean Control	0.317	0.317	0.317	0.317	0.314	0.317

Note: 2SLS results. The dependent variable is a dummy which is = 1 if respondent says the policy was adopted in municipality, 0 otherwise. Information Session is a dummy which is = 1 if the municipality's mayor attended the information session about tax reminders, 0 otherwise. This last variable is instrumented with treatment assignment. In the rows below the coefficients, Drops Inattentive refers to whether respondents that failed the survey attention check component of the reminders policy are excluded from the model, where the attention check was "The tax reminders sent informed taxpayers that the Brazilian constitution was reformed in 1988". We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Mayors' characteristics included as interactions are: Male (1/0); Age above-below median (1/0); College (1/0); 2nd Term (1/0); Electoral Margin of Victory above-below median (1/0); and Leftist Political Party (1/0, mayors belonging to a center-leftist party according to historical political platforms). Robust standard errors clustered at the municipality level are in parenthesis.

**TABLE A.13: POLICY-ADOPTION EXPERIMENT:
POLICY ADOPTION: HETEROGENEOUS EFFECTS TAX REMINDERS - MUNICIPALITY
CHARACTERISTICS**

LHS Variable	(1) Adopted	(2) Adopted	(3) Adopted	(4) Adopted	(5) Adopted	(6) Adopted	(7) Adopted	(8) Adopted
Characteristic	Population	College Pop	PubAdm College	Poverty	Gini	Big South	Pc Income	Local Taxes
Information Session	0.1158 (0.0713)	0.0764 (0.0840)	0.1439 (0.0741)	0.1344 (0.0679)	0.1958 (0.0787)	0.1001 (0.0877)	0.0743 (0.0803)	0.0567 (0.0790)
Information Session * Characteristic	-0.0276 (0.1068)	0.0458 (0.1084)	-0.0805 (0.1060)	-0.0794 (0.1081)	-0.1758 (0.1063)	0.0130 (0.1099)	0.0488 (0.1066)	0.0689 (0.1063)
Characteristic	0.0069 (0.0287)	0.0408 (0.0290)	0.0397 (0.0288)	-0.0777 (0.0291)	-0.0312 (0.0288)	0.0855 (0.0294)	0.0707 (0.0289)	0.0415 (0.0289)
Observations	2,271	2,271	2,271	2,271	2,271	2,271	2,271	2,269
Respondent	All	All	All	All	All	All	All	All
Drops Inattentive	No	No	No	No	No	No	No	No
Clusters (Municipalities)	1,465	1,465	1,465	1,465	1,465	1,465	1,465	1,464
Mean Control	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317

Note: 2SLS results. The dependent variable is a dummy which is = 1 if respondent says the policy was adopted in municipality, 0 otherwise. Information Session is a dummy which is = 1 if the municipality's mayor attended the information session about tax reminders, 0 otherwise. This last variable is instrumented with treatment assignment. In the rows below the coefficients, Drops Inattentive refers to whether respondents that failed the survey attention check component of the reminders policy are excluded from the model, where the attention check was "The tax reminders sent informed taxpayers that the Brazilian constitution was reformed in 1988". We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Municipalities' characteristics included as interactions are: Population above-below median (1/0); College Population above-below median (1/0); College Public Administration employees above-below median (1/0); Poverty above-below median (1/0); Gini above-below median (1/0); Big South (1/0, where 1 are south, southeast and mid-west regions; and 0 are north and northeast regions); monthly Per Capita Income above-below median (1/0); Local Tax Revenues share above-below median (1/0). Robust standard errors clustered at the municipality level are in parenthesis.

**TABLE A.14: POLICY-ADOPTION EXPERIMENT:
POLICY ADOPTION - WITH INDIVIDUAL AND MUNICIPAL COVARIATES: TAX REMINDERS
INFORMATION COMPONENTS**

LHS Variable	(1) On Time	(2) Audit	(3) Social Norm	(4) Before Due	(5) Letter
Information Session	0.1014 (0.0522)	0.0720 (0.0471)	0.0990 (0.0374)	0.0884 (0.0515)	0.0752 (0.0413)
Observations	2,239	2,239	2,239	2,239	2,239
Respondent	All	All	All	All	All
Drops Inattentive	No	No	No	No	No
Mayor Characteristics	Yes	Yes	Yes	Yes	Yes
Municipal Characteristics	Yes	Yes	Yes	Yes	Yes
Clusters (Municipalities)	1,447	1,447	1,447	1,447	1,447
Mean Control	0.310	0.220	0.112	0.290	0.155

Note: 2SLS results. The dependent variable is a dummy which is = 1 if respondent says the policy was adopted in municipality, 0 otherwise. On Time refers to a reminder message highlighting the tax payment deadline. Audit refers to a reminder message highlighting the risks of audits for not paying taxes on time. Social Norm refers to a reminder message highlighting the social norm of paying taxes. Before due refers to sending the reminder message before taxes' due date. Letter refers to sending the reminder message using a hard copy letter. Information Session is a dummy which is = 1 if the municipality's mayor attended the information session about tax reminders, 0 otherwise. This last variable is instrumented with treatment assignment. In the rows below the coefficients, Drops Inattentive refers to whether respondents that failed the survey attention check component of the reminders policy are excluded from the model, where the attention check was "The tax reminders sent informed taxpayers that the Brazilian constitution was reformed in 1988". We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Mayors' characteristics included in the model are: Male (1/0); Age above-below median (1/0); College (1/0); 2nd Term (1/0); Electoral Margin of Victory above-below median (1/0); and Leftist Political Party (1/0, mayors belonging to a center-leftist party according to historical political platforms). Municipalities' characteristics included in the model are: Population above-below median (1/0); College Population above-below median (1/0); College Public Administration employees above-below median (1/0); Poverty above-below median (1/0); Gini above-below median (1/0); Big South (1/0, where 1 are south, southeast and mid-west regions; and 0 are north and northeast regions); monthly Per Capita Income above-below median (1/0); Local Tax Revenues share above-below median (1/0). Robust standard errors clustered at the municipality level are in parenthesis.

**TABLE A.15: POLICY-ADOPTION EXPERIMENT:
POLICY ADOPTION - WITH INDIVIDUAL AND MUNICIPAL COVARIATES: FINANCIAL
INCENTIVES AND E-PROCUREMENT**

LHS Variable	(1) Financial Incentives	(2) E-procurement
Information Session	0.0033 (0.0557)	0.0153 (0.0644)
Observations	2,177	1,675
Respondent	All	All
Drops Inattentive	No	No
Mayor Characteristics	Yes	Yes
Municipal Characteristics	Yes	Yes
Clusters (Municipalities)	1,434	1,178
Mean Control	0.600	0.447

Note: 2SLS results. The dependent variable is a dummy which is = 1 if respondent says the policy was adopted in municipality, 0 otherwise. Information Session is a dummy which is = 1 if the municipality's mayor attended the information session about tax reminders, 0 otherwise. This last variable is instrumented with treatment assignment. In the rows below the coefficients, Drops Inattentive refers to whether respondents that failed the survey attention check component of the reminders policy are excluded from the model, where the attention check was "The tax reminders sent informed taxpayers that the Brazilian constitution was reformed in 1988". We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Mayors' characteristics included in the model are: Male (1/0); Age above-below median (1/0); College (1/0); 2nd Term (1/0); Electoral Margin of Victory above-below median (1/0); and Leftist Political Party (1/0, mayors belonging to a center-leftist party according to historical political platforms). Municipalities' characteristics included in the model are: Population above-below median (1/0); College Population above-below median (1/0); College Public Administration employees above-below median (1/0); Poverty above-below median (1/0); Gini above-below median (1/0); Big South (1/0, where 1 are south, southeast and mid-west regions; and 0 are north and northeast regions); monthly Per Capita Income above-below median (1/0); Local Tax Revenues share above-below median (1/0). Robust standard errors clustered at the municipality level are in parenthesis.

**TABLE A.16: POLICY-ADOPTION EXPERIMENT:
ACCURACY OF BELIEFS AND POLICY ADOPTION - WITH INDIVIDUAL AND MUNICIPAL
COVARIATES: TAX REMINDERS**

Panel A	(1)	(2)	(3)	(4)	(5)
LHS Variable	Accuracy of Beliefs	Accuracy of Beliefs	Accuracy of Beliefs	Accuracy of Beliefs	Accuracy of Beliefs
Information Session	1.3975 (0.5209)	1.3541 (0.5201)	1.5031 (0.5589)	1.1923 (0.7396)	1.5125 (0.6839)
Mean Control	-6.980	-6.983	-6.998	-6.869	-7.060
Panel B	(1)	(2)	(3)	(4)	(5)
LHS Variable	Adopted	Adopted	Adopted	Adopted	Adopted
Accuracy of Beliefs	0.0856 (0.0500)	0.0935 (0.0537)	0.0819 (0.0483)	0.1344 (0.1084)	0.0799 (0.0562)
Mean Control	0.310	0.306	0.285	0.357	0.271
Observations	2,172	2,141	1,936	842	1,299
Respondent	All	All	All	Mayor	Finance Staff
Drops Inattentive	No	No	Yes	No	No
Mayor Characteristics	No	Yes	Yes	Yes	Yes
Municipal Characteristics	No	Yes	Yes	Yes	Yes
Clusters (Municipalities)	1,434	1,416	1,360	842	1,299

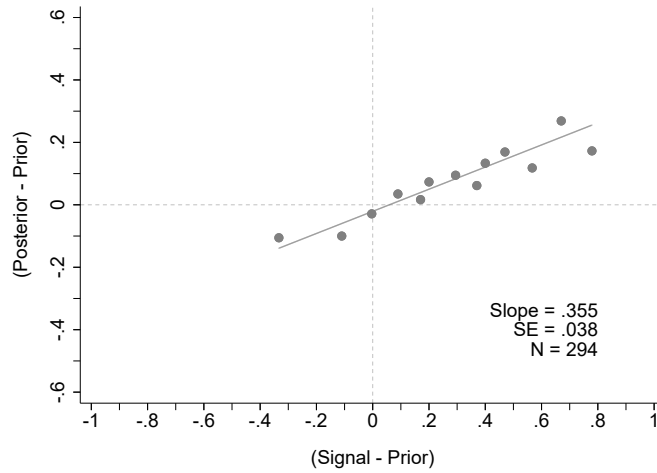
Note: 2SLS results where Treatment Assignment is the instrument for Information Session (in Panel A) and for Accuracy of Beliefs (in Panel B). In Panel A, the dependent variable—Accuracy of Beliefs—is the absolute difference multiply by -1 between self-reported beliefs about effect sizes of tax reminders on local tax revenues and the 12 percent informed effect size of the reminder letters policy during the information session. Information Session is a dummy which is = 1 if the municipality's mayor attended the information session about tax reminders, 0 otherwise. In Panel B, the dependent variable is a dummy which is = 1 if respondent says the policy was adopted in municipality, 0 otherwise. Accuracy of Beliefs is the absolute difference multiplied by -1 between self-reported beliefs about effect sizes of tax reminders on local tax revenues and the 12 percent informed effect size of the reminder letters policy during the information session. In the rows below the coefficients of the last panel, Drops Inattentive refers to whether respondents that failed the survey attention check component of the reminders policy are excluded from the model, where the attention check was "The tax reminders sent informed taxpayers that the Brazilian constitution was reformed in 1988". We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Mayors' characteristics included in the model are: Male (1/0); Age above-below median (1/0); College (1/0); 2nd Term (1/0); Electoral Margin of Victory above-below median (1/0); and Leftist Political Party (1/0, mayors belonging to a center-leftist party according to historical political platforms). Municipalities' characteristics included in the model are: Population above-below median (1/0); College Population above-below median (1/0); College Public Administration employees above-below median (1/0); Poverty above-below median (1/0); Gini above-below median (1/0); Big South (1/0, where 1 are south, southeast and mid-west regions; and 0 are north and northeast regions); monthly Per Capita Income above-below median (1/0); Local Tax Revenues share above-below median (1/0). Robust standard errors clustered at the municipality level are in parenthesis.

**TABLE A.17: POLICY-ADOPTION EXPERIMENT:
ACCURACY OF BELIEFS AND CONFIDENCE - WITH INDIVIDUAL AND MUNICIPAL COVARIATES:
TAX REMINDERS AND FINANCIAL INCENTIVES**

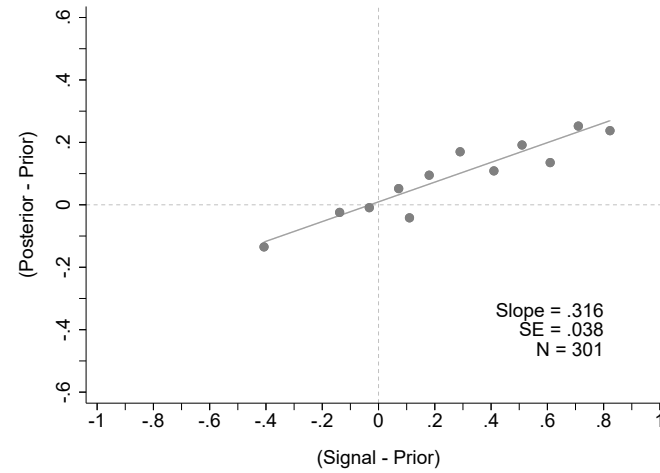
Panel A - ToT LHS Variable	Tax Reminders			Financial Incentives		
	(1) Accuracy of Beliefs	(2) Accuracy of Beliefs	(3) Accuracy of Beliefs	(4) Accuracy of Beliefs	(5) Accuracy of Beliefs	(6) Accuracy of Beliefs
Information Session	1.2931 (0.5209)	1.2289 (0.7433)	1.3797 (0.6815)	-0.4037 (0.5309)	0.1659 (0.7959)	-0.6523 (0.6845)
Mean Control	-6.971	-6.869	-7.039	-7.028	-6.741	-7.219
Panel B - ITT LHS Variable	Tax Reminders			Financial Incentives		
	(1) Accuracy of Beliefs	(2) Accuracy of Beliefs	(3) Accuracy of Beliefs	(4) Accuracy of Beliefs	(5) Accuracy of Beliefs	(6) Accuracy of Beliefs
Treatment Assignment	0.5144 (0.2073)	0.5022 (0.3058)	0.5382 (0.2670)	-0.1577 (0.2074)	0.0661 (0.3204)	-0.2510 (0.2641)
Mean Control	-6.971	-6.869	-7.039	-7.028	-6.741	-7.219
Panel C - ToT LHS Variable	Tax Reminders			Financial Incentives		
	(1) Confidence	(2) Confidence	(3) Confidence	(4) Confidence	(5) Confidence	(6) Confidence
Information Session	0.0740 (0.1073)	0.0848 (0.1730)	0.0822 (0.1368)	-0.0164 (0.1129)	-0.3352 (0.1783)	0.1979 (0.1419)
Mean Control	-0.019	0.109	-0.105	-0.002	0.129	-0.089
Panel D - ITT LHS Variable	Tax Reminders			Financial Incentives		
	(1) Confidence	(2) Confidence	(3) Confidence	(4) Confidence	(5) Confidence	(6) Confidence
Treatment Assignment	0.0295 (0.0429)	0.0348 (0.0717)	0.0321 (0.0536)	-0.0064 (0.0443)	-0.1335 (0.0712)	0.0762 (0.0548)
Mean Control	-0.019	0.109	-0.105	-0.002	0.129	-0.089
Observations	2,155	845	1,310	2,125	830	1,295
Respondent	All	Mayor	Finance Staff	All	Mayor	Finance Staff
Drops Inattentive	No	No	No	No	No	No
Mayor Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Municipal Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Clusters (Municipalities)	1,422	845	1,310	1,414	830	1,295

Note: 2SLS (panels A and C) and OLS (panels B and D) results. In panels A and B, the dependent variable is the absolute difference multiply by -1 between self-reported beliefs about effect sizes of the policy on local tax revenues and the 12 percent informed effect size of the reminder letters policy during the information session. In panels C and D, the dependent variable is self-reported confidence level about beliefs in a likert-scale of 1 to 5 (standardized to mean 0 and standard deviation 1). Information Session is a dummy which is = 1 if the municipality's mayor attended the information session about tax reminders, 0 otherwise. This last variable is instrumented with Treatment Assignment. Treatment Assignment is a dummy which is = 1 if the mayor was assigned to treatment group, 0 otherwise. In the rows below the coefficients of the last panel, Drops Inattentive refers to whether respondents that failed the survey attention check component of the reminders policy are excluded from the model, where the attention check was "The tax reminders sent informed taxpayers that the Brazilian constitution was reformed in 1988". We expressed all continuous variables as indicators of above-below the median of the distribution of municipalities. Mayors' characteristics included in the model are: Male (1/0); Age above-below median (1/0); College (1/0); 2nd Term (1/0); Electoral Margin of Victory above-below median (1/0); and Leftist Political Party (1/0, mayors belonging to a center-leftist party according to historical political platforms). Municipalities' characteristics included in the model are: Population above-below median (1/0); College Population above-below median (1/0); College Public Administration employees above-below median (1/0); Poverty above-below median (1/0); Gini above-below median (1/0); Big South (1/0, where 1 are south, southeast and mid-west regions; and 0 are north and northeast regions); monthly Per Capita Income above-below median (1/0); Local Tax Revenues share above-below median (1/0). Robust standard errors clustered at the municipality level are in parenthesis.

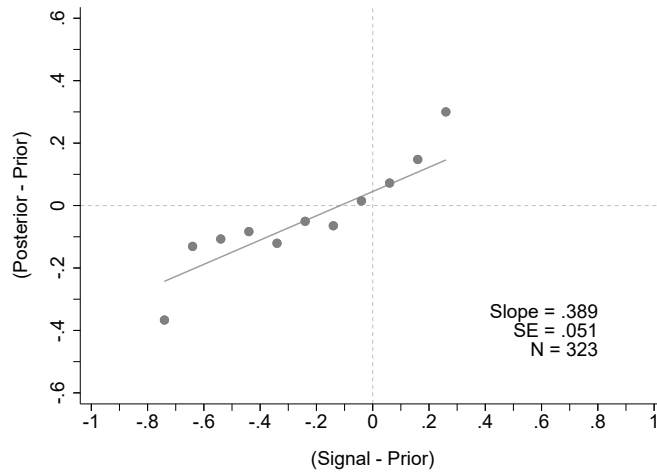
**FIGURE A.1: BELIEFS EXPERIMENT:
BELIEF UPDATING BY STUDY**



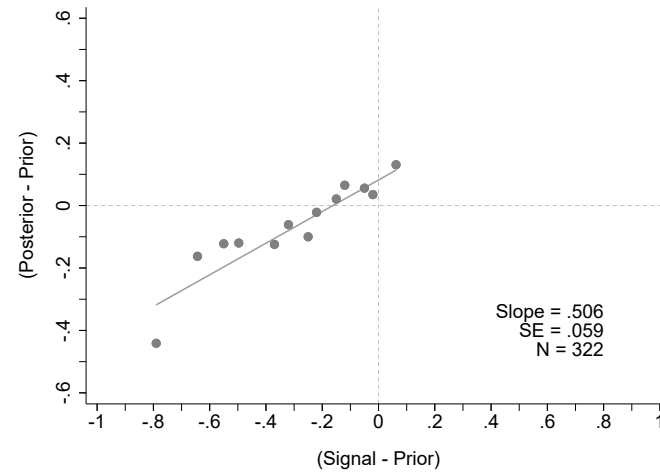
(a) Michigan



(b) Jamaica



(c) Colombia



(d) US

Notes: Comparison between the difference in respondent's perceptions after buying some study (i.e. posterior beliefs minus prior beliefs) and the difference in respondent's perceptions before buying some study (i.e. signal minus prior beliefs), averaged over bins of rounds 1 and 2. Prior is the belief of the respondent about the effect, right before buying some study. Signal is the bought study's effect size. When dealing with a second update in posteriors, the first update is treated as a prior. Panel (a) shows statistics for Michigan study. Panel (b) shows statistics for Jamaica study. Panel (c) shows statistics for Colombia study. Panel (d) shows statistics for US study. The slope and robust standard errors clustered at the individual level are based on a linear regression with a constant term.

B Beliefs Experiment: Script

BELIEFS EXPERIMENT: ECD: DESCRIPTION

What is the program? The **early childhood development (ECD) program** consists of play sessions for children from low-income backgrounds, aged 4 months to 5 years old. The intervention is similar to the “Criança Feliz” program in Brazil, and can be implemented through either home visits or at child care centers.

The program is conducted by a public school teacher or a trained health worker. The activities in the play sessions include describing and naming objects in the environment to the children, responding to the child’s actions and vocalizations, playing educational games, and using picture books and songs that help in language acquisition.

The program is usually targeted at low-income children and, for example, might involve 1 day per week of activities for 2 years.

**BELIEFS EXPERIMENT:
ECD: GOAL AND MEASURE**

What is the goal of such a program? The goal of the program is to increase children's cognitive skills. **Cognitive skills** are the ability to think and understand. They are important for students' academic performance.

How do we measure cognitive skills? Prova Brasil is an example of a tool that measures cognitive skills.

To help you understand the units in which cognitive skills are measured, here is a helpful number: students who have completed one more year of high school have cognitive skills that are 0.2 points higher on average, measured on a test scale such as the Prova Brasil.

So, purely as an example, suppose some policy increased cognitive skills by 0.2 points. That would be a similar-sized effect as one additional year of high school.

BELIEFS EXPERIMENT: ECD: BENCHMARKS

Policies vary by the extent to which they affect children’s cognitive skills. Some policies have no effect, or even hurt. Others might have a large positive effect. The table below helps you understand how the increase in cognitive skills due to different policies compare to the gain of one additional year of high school.

The policy	The policy increases cognitive skills by:										
<i>one additional year of high school</i>	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
	Cognitive points										
Assigning a more experienced teacher to the classroom	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
A program similar to Bolsa Familia	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Replacing group teaching by individual teaching	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1

BELIEFS EXPERIMENT:
PRIOR ELICITING: OWN MUNICIPALITY

Q14. Suppose the Early Childhood Development program is implemented, targeting children from low-income families in **your municipality**.

What do you expect the increase in cognitive skills to be if the program is implemented in your municipality?

0	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1
---	-----	-----	-----	-----	-----	-----	-----	-----	-----	---

**BELIEFS EXPERIMENT:
PRIOR ELICITING: OTHER CONTEXT**

Context 2: Ypsilanti, a city in the state of Michigan, USA

The early childhood development program was implemented for **123** children from low-income families in **Ypsilanti, a city in the state of Michigan, USA**. What do you think the effect of the program was there?

Note that we will compare your prediction against the answer found by researchers who conducted a scientific study of the program among **123** children from low-income families in **Ypsilanti, a city in the state of Michigan, USA**. The researchers compared the cognitive skills of children randomly assigned to the program with the cognitive skills of those randomly assigned not to receive the program.

The closer your prediction is to the result found by the researchers, the greater the reward you will be given. If your prediction is exactly right, you will receive **100** lottery tickets. If your prediction is as far as possible from the correct answer, you will receive **0** lottery tickets.

**BELIEFS EXPERIMENT:
BDM INSTRUCTIONS**

So far, we have asked you to share your opinions about the likely effect of the program on children's cognitive skills.

Now, we will offer you the chance to learn the results of studies which have evaluated the program. These studies seek to measure what the true effect of the program was in a certain context. We will give you the chance to purchase access to this answer as described below.

First, we will give you 100 lottery tickets for the lucky draw to win a free trip to USA to visit Harvard University.

Then, you will have the chance to spend some of these tickets to learn about the program effect evaluated by the studies. You will have to tell us the maximum number of lottery tickets out of the 100 that you are willing to give up in order to learn the result of the research.

After you tell us the maximum number of tickets you are willing to pay, the computer will randomly select a "price" for the information, which will be between 0 and 100 lottery tickets.

If the price randomly chosen by the computer is above the amount you are willing to pay, you will not pay anything, and you will not learn the result, but you will retain all 100 lottery tickets.

If the price selected by the computer is below the maximum amount you indicated, you will pay only the selected price by the computer, and you will keep the remaining lottery tickets.

**BELIEFS EXPERIMENT:
POSTERIOR ELICITING: OWN MUNICIPALITY**

Context 1: **Your own municipality**

Suppose the Early Childhood Development program is implemented for children from low-income families in **your municipality**. Recall that the study of **123** children from low-income families in **Ypsilanti, a city in the state of Michigan, USA**, found an effect of **0.87** points, but the effect in your municipality might be different.

Q19. What do you expect the increase in cognitive skills to be if the program is implemented in your municipality?

0	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1
---	-----	-----	-----	-----	-----	-----	-----	-----	-----	---

C Policy-Adoption: Policy Brief

POLICY-ADOPTION EXPERIMENT: POLICY BRIEF: PAGE 1



HOW TO INCREASE **COMPLIANCE** WITH LOCAL TAXES

A Policy Brief
Based on
Scientific
Research

INTRODUCTION

Raising tax revenue locally is an important task for municipal governments in Brazil. Local taxes increase the municipal budget, but also provide untied funds which the municipality can spend in line with its own priorities. But municipalities in Brazil face a serious challenge when it comes to collecting local taxes: many businesses and individuals who owe tax payments do not comply with the tax laws by paying the full amounts on time.

Governments throughout the world, including Brazil, have tried many innovative methods to solve this problem. But what works, and what does not? This policy brief provides simple results from scientific research on how governments can increase compliance with taxes.

A LOW-COST AND EFFECTIVE WAY TO INCREASE TAX COMPLIANCE: REMINDER LETTERS

Research conducted in Latin America has revealed one very simple and inexpensive action that has proven to be effective in increasing compliance: **sending taxpayers reminder letters before the due date of the taxes.**¹ For example, an academic researcher worked with two municipal governments in Peru, and found that property tax compliance increased by 10% simply by sending a letter to taxpayers which reminded them of the tax payment deadline!² Similar results have been found in other studies, including in the United States, Austria and the United Kingdom.³

1 Taxpayers are those legally responsible to pay taxes. For instance, taxpayers of the urban property tax (IPTU) are the owners of the property (or the tenants if it is explicitly stated in the lease agreement). Taxpayers of the services of any nature tax (ISSQN), are the professionals or businesses that provide the service.

2 Del Carpio (2013)

3 Coleman (1996), Hallsworth et al. (2014), Fellner et al. (2013)

POLICY-ADOPTION EXPERIMENT: POLICY BRIEF: PAGE 2



Research can also guide how to make the reminder letters even more effective. An important policy lesson is that **the letter should emphasize that most people pay their taxes on time**. The same study in Peru found that tax compliance increased by 20% if the reminder letter also included a sentence like "The vast majority of your neighbors pay their taxes on time!" or "75% of your neighbors pay their taxes on time!" Such a message highlights that paying taxes on time is a "social norm", and those who don't pay are deviating from the desirable social norm.

There is one final lesson from research on how to increase the effectiveness of tax reminder letters: **highlight the threat of audits or penalties due to not paying taxes on time**. For example, a study in Argentina found that sending out a letter to property owners (who are supposed to pay property taxes) emphasizing the possible fines and audits due to evading taxes increased tax compliance by 12%.⁴

An important point to keep in mind is that reminder letters are inexpensive to send. All that is needed is for the municipal tax authorities to know the addresses of potential taxpayers. In many cases, letters are already being sent to such taxpayers.

Simply by choosing the correct content of the letter, to remind taxpayers of the payment deadline, to emphasize social norms, and to highlight the threat of audits or penalties, governments have been able to increase tax compliance and revenues, and reduce tax evasion. This can be a very cost-effective policy, and is moreover easy to implement compared to most other strategies to increase tax revenues.⁵

POLICY LESSONS

To summarize, this brief provides a total of **three policy lessons**:

- Send letters to taxpayers reminding them of the deadline to pay taxes.
- Emphasize in the letter that most people pay their taxes on time.
- Highlight the potential bad consequences of avoiding taxes: fines and audits.

An example letter is provided on Page 3 of this policy brief. Contact the Project team at contato@pesquisadoresdeharvardcnm.com to receive an electronic copy of the letter.

⁴ Castro and Scartascini (2013)

⁵ A cost-effective action is one that produces good results with a small cost.

**POLICY-ADOPTION EXPERIMENT:
POLICY BRIEF: PAGE 3**

EXAMPLE

REMINDER
LETTER FOR
TAX PAYMENT

A Policy Brief
Based on
Scientific
Research

**FEATURING PAYMENT
DEADLINE, SOCIAL NORMS,
AND THREAT OF PENALTIES**

Dear Sir/Madam,

Your municipal tax payments are due by **01 November 2016**.

Our statistics show that the **vast majority of your neighbors will pay their taxes on time**.
We greatly appreciate your doing the same.

Don't forget to report your taxes accurately and in a timely manner to avoid the **risk of an audit**, which is a time-consuming and costly process that may lead to substantial financial and other penalties if your tax reporting is found to be wrong.

It is easy to pay your taxes. Please follow the enclosed instructions for more information.

If you have already paid your taxes, thank you very much! If not, please act now.

Yours faithfully,
Name of Tax Authority



How to Increase Compliance with Local Taxes • 3

**POLICY-ADOPTION EXPERIMENT:
POLICY BRIEF: PAGE 4**

REFERENCES
OF THE ACADEMIC
RESEARCH

How to
Increase
Compliance
with Local
Taxes

- Castro, L. and Scartascini, C. (2015). "Tax Compliance and Enforcement in the Pampas. Evidence from a Field Experiment." *Journal of Economic Behavior & Organization*, 116: 65-82.
Examines provincial property taxpayers in Argentina. Finds a strong effect of reminding taxpayers about the possibility of being audited if they do not pay their taxes.
- Coleman, S. (1996). "The Minnesota Income Tax Compliance Experiment: State Tax Results." MPRA Paper No. 4827, University of Munich.
Examines income taxpayers in Minnesota. Finds a strong effect of a reminder letter emphasizing social norms, and of a letter reminding about the possibility of audits.
- Del Carpio, L. (2013). "Are the Neighbors Cheating? Evidence from a Social Norm Experiment on Property Taxes in Peru." Princeton, NJ: Princeton University Working Paper.
Examines municipal taxpayers in Peru. Finds a strong effect of reminder letters and an even stronger effect of a letter emphasizing social norms.
- Fellner, G., Sausgruber, R., and Traxler, C. (2013). "Testing Enforcement Strategies in the Field: Threat, Moral Appeal, and Social Information." *Journal of the European Economic Association*, 11: 634-660.
Examines TV license taxpayers in Austria. Finds a strong effect of reminder letter and even stronger effect of a letter reminding about the possibility of audits.
- Hallsworth, M., List, J.A., Metcalfe, R.D., and Vlaev, I. (2014). "The Behavioralist as Tax Collector: Using Natural Field Experiments to Enhance Tax Compliance." NBER Working Paper No. 20007.
Examines income taxpayers in the UK. Finds a strong effect of reminder letter and social norm letter.
- Hasseldine, J., James, S., and Toumi, M. (2007). "Persuasive Communications: Tax Compliance Enforcement Strategies for Sole Proprietors." *Contemporary Accounting Research*, 24: 171-194.
Examines payers of business tax in the UK. Finds a strong effect of a letter reminding about the possibility of audit.