

In Science we (should) trust: expectations and compliance during the COVID-19 pandemic

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36 The COVID-19 pandemic caused by the novel coronavirus SARS-COV-2 has led many
37 countries to implement strict measures to limit the spread of the disease (1). Advocated by both
38 governments and scientists, these measures go from voluntary social distancing and mask wearing
39 to mandatory stay-at-home policies (2, 3). Given the scale of the pandemic, the effectiveness of
40 these measures relies on people's voluntary compliance, as governments cannot coercively enforce
41 them. Governments' success depends on their legitimacy, the swiftness of their response, their
42 communication strategy, how they combine moral and emotional appeals, and their capacity to
43 leverage people's cognitive biases to effectively influence their behavior (4-8). Voluntary
44 participation of millions of individuals represents a non-trivial, massive social dilemma, in which
45 individuals may not sufficiently consider the positive externality of compliance. Cooperation in
46 large scale social dilemmas like this one is heavily influenced by the expectations of individuals
47 about the behavior of others (9-11), and the emergence of social norms supporting compliant
48 behavior might significantly increase people's willingness to comply (12, 13). Specifically,
49 people's belief about how others in their reference group are behaving, their *empirical expectations*,
50 and their beliefs about what others believe is the right thing to do, their *normative expectations*,
51 might influence their behavior (13, 14).

52 In this paper, we analyze how empirical and normative expectations shape voluntary
53 compliance by looking at how individuals condition their behavior to the behavior and normative
54 views of others in a survey experiment run in nine countries. Our survey experiment was run in
55 countries in Asia, Europe and the Americas differentially affected by the pandemic: China,
56 Colombia, Germany, Italy, Mexico, South Korea, Spain, the United Kingdom, and the United States
57 of America. Our study contributes to a growing social scientific literature on the determinants of
58 compliance with behavioral policies set in place to curb the spread of COVID-19. Previous research
59 has studied, for example, the impact of partisanship and ideology (15, 26), expected duration of the
60 policies (17), and misinformation (18) on people's willingness to comply with the public health
61 measures designed to curb the spread of the disease. In our experiment, we randomly assign
62 participants to different conditions, and present respondents with a vignette describing a
63 hypothetical situation in which we manipulate both the degree at which others comply with the
64 public health measures and the degree at which others believe people should comply with the
65 measures, in a 2x2 factorial design.

66 As a robustness check for the internal validity of the vignette experiment, we compare the
67 experimental outcomes (likelihood of compliance with public health guidelines) with actual
68 compliance, both before and after strict enforcement policies are implemented in each country (e.g.
69 a lockdown). To do so, we assess individuals' self-reported levels of compliance before and after
70 confinement policies were implemented in their countries, as well as their empirical and normative
71 expectations (again, before and after the lockdown).

72 Our results strongly suggest that increasing *both* empirical and normative expectations has
73 a substantial and significant impact on people's willingness to practice social distancing and staying
74 at home. In the survey experiment, compliance with practicing social distancing goes up on a ten
75 points scale from 4.93 to 7.57 (a 55% increase), and practicing staying at home goes up from 4.88
76 to 7.63 (a 56% increase). Either higher empirical or normative expectations (but not both, as in our
77 'incongruent' expectations conditions in which one of them is low) only generate a modest effect.
78 While the former result is substantial, robust to the introduction of additional controls, and
79 significant across each of the nine countries surveyed, the latter is less systematic, weaker and not
80 always significant. Similar results are observed when we compare the level of self-reported

81 compliance among those with high empirical *and* normative expectations (above the median
82 expectation in their country), as voluntary compliance in both the practice of social distancing and
83 staying at home goes up by 37% (from 55.24 to 75.50, before the lockdowns were enforced by
84 governments).

85 What are the mechanisms behind this substantial effect? The effectiveness of policies
86 promoting voluntary compliance crucially depends on how individuals perceive these policies and
87 their inner rationale. Institutions trusted by people are typically seen as more credible sources of
88 empirical and normative information (19). The multidimensional nature of the pandemic may
89 require not only trust in the agent (e.g. a government agency delivering a compliance message), but
90 also trust in the messenger providing its underlying logic (e.g. the scientific rationale for
91 confinement, wearing masks, or social distancing). The uncertainty created by infectious outbreaks
92 (20) represents a serious challenge to any policy promoting voluntary compliance, as beyond the
93 level of trust in the agent (e.g. the government) recipients of any message must also be convinced
94 by the trustworthiness of the messenger (e.g. epidemiologists, virologists, scientists in general) (21).
95 Unfortunately, since the pandemic started the messages of scientists and the messages of
96 governments have not always been consistent (22).

97 We investigate how in this context trust in scientists and trust in government act as relevant
98 moderators (7, 21). We hypothesize that the degree to which people practice social distancing and
99 stay at home depends on perceived social norms (as defined by the joint effect of empirical and
100 normative expectations), and that compliance will be ultimately driven by their trust in the
101 institutions that promote or back up compliant behaviors. In other words, we are interested in
102 learning whether empirical and normative expectations affect people's willingness to comply with
103 social distancing and staying at home policies, but also whether trust in scientists and government
104 moderate this relationship.

105 We explore how the individual level of trust in different institutions and reference groups
106 shape compliance, and interact with high empirical and normative expectations. We specifically
107 focus on two groups: government and science. The logic behind this focus is straightforward. The
108 lack of trust in government may lower the credibility of government policies and generate low
109 compliance with public health guidelines (23, 24). The lack of trust in science may actually decrease
110 the expected effectiveness of public health policies (25). Given the often-confusing messages
111 towards the validity of scientific evidence sent by governments during the COVID-19 pandemic,
112 we find the analysis of this trade-off extremely relevant to actual policies.

113 Our results strongly suggest that both types of trust play very different roles. Generally, high
114 levels of trust in government generate modest increases in compliance (relative to the level of
115 compliance observed among those with low levels of trust in government). As respondents in our
116 survey experiment are randomly assigned to one of four conditions, we can cleanly disentangle the
117 effect of expectations from the effect of trust. High trust in governments has a modest effect when
118 expectations of compliance are high in our vignette experiment. Consistent with previous results
119 (26, 27), when individuals have high trust in government, compliance with public health guidelines
120 (social distancing and staying at home) goes up by a modest amount of around 5% (relative to those
121 with low trust in government). In sharp contrast, in the same high expectations condition, a high
122 level of trust in science generates a much larger increase in compliance (boosting it by 23%.) These
123 findings are robust to different measurement methods and to the introduction of country level and
124 individual controls. Interestingly, we obtain very similar results when studying the effect of trust in
125 government and trust in science on self-reported compliance: the effect of holding high levels of
126 trust in science is three times higher, as high trust in science increases self-reported compliance by
127 76% before the lockdown is introduced and by 127% after the lockdown is enforced.

128 Our results document how trust in science is a necessary means to achieve compliance, even
129 in the most favorable scenario (with high empirical and normative expectations about others'
130 compliance), and regardless of the level of trust in government. Capping trust in science by

131 challenging the legitimacy and rigor of scientific evidence may come at a very large price: a major
132 and pernicious effect on compliance, facilitating the spread of the pandemic. In the rest of the paper,
133 we describe the survey in section 2, present the results in section 3 and discuss the limitations and
134 policy lessons of our study in the final section.
135

136 **Materials and Methods**

137 Our survey was administered in China, Colombia, Germany, Italy, Mexico, South Korea,
138 Spain, the United Kingdom, and the United States. It was translated and back translated into the
139 language spoken in each of the countries by native local speakers, with a national of each country
140 being in charge of the version run in each country (Colombian, Mexican and Spanish nationals were
141 in charge of the versions administered in Colombia, Mexico and Spain, and the same version was
142 administered in the USA and the United Kingdom, as the only exception). The survey was
143 administered to samples of ~1.25K respondents per country through panels of respondents
144 previously recruited by survey companies. Representative samples were balanced in terms of age
145 and gender. Demographic characteristics are reported in Table S1 in the Supporting Materials.
146 Before answering the survey, potential respondents were informed about the nature and duration of
147 the study and asked to provide consent.

148 Our survey focuses on compliance with two specific policy guidelines, common across the
149 nine countries studied (social distancing and staying at home, described to participants in plain
150 words, see the instructions in the Supporting Materials). Our method is grounded on the theory of
151 social norms [13] and follows its standard methodology [14]. Our first research question is to
152 determine whether individual choices to comply are affected by social expectations. We consider a
153 social norm is in place whenever people choose to comply with an observable (but not necessarily
154 official) rule of behavior not just because it is consistent with their personally held beliefs, but also
155 because their expectations about others support it. Whenever social norms are at play, an
156 individual's decision to conform with a rule of behavior is conditional on their first-order beliefs
157 about whether people in a reference group follow that rule (*empirical expectations*) and on their
158 second-order beliefs about whether they think that others believe one ought to obey the rule
159 (*normative expectations*).

160 The survey was administered online, divided in 8 blocks (see Figure S1 in the Supporting
161 Materials), and took around 7 minutes to complete. For the purpose of this paper, the survey has
162 four components of interest. In blocks 1 and 2 (questions 1 to 14), we elicit information about the
163 individual characteristics of participants, including attitudes towards, exposure to, and risk
164 assessment of the pandemic (see Table S1 in the Supporting Materials). In blocks 3 to 6 (questions
165 15 to 30), we elicit their individual degree of compliance with the recommended practices, their
166 personal normative beliefs, and their empirical and normative expectations, before and after the
167 enforcement of strict compliance rules, linked to the moment in which countries imposed
168 lockdowns. In block 8 (questions 33 and 34, with multiple entries) we measure their level of trust
169 in different groups (see Tables S3 and S4 in the Supporting Materials).

170 The core of the survey is the vignette experiment in which we study whether compliance is
171 conditional on expectations. The vignettes used in the survey experiment were simple. Individuals
172 were asked to imagine a specific situation and then were asked to answer two simple questions
173 about the vignette protagonist's level of compliance. The situation was described in clear terms:
174 "Somebody like you lives in a very similar country that is affected by Coronavirus (COVID-19).
175 *Most/Few* residents are practicing social distancing and staying at home apart from unavoidable
176 and necessary trips. *Most/Few* residents also believe that one should practice social distancing and
177 stay at home apart from unavoidable and necessary trips", with the manipulation in italics. As

178 empirical and normative expectations could be either High (Most) or Low (Few), our design follows
179 a 2x2 factorial design, with congruent expectations in two conditions (High/High or Low/Low),
180 and incongruent expectations in the other two (High Normative and Low Empirical or Low
181 Normative and High Empirical). After the description of the situation, participants were asked to
182 answer two simple questions on a 1-10 scale: “How likely is this person to practice social
183 distancing/stay at home in this situation? Subjects were randomly assigned to one condition,
184 following a between-subjects protocol.

185 Our methodology has several merits. First, it gives us the chance to claim causality from the
186 random assignment to one, and only one, condition. If predicted compliance is significantly
187 different between low and high (congruent) expectations, we can conclude that preferences for
188 compliance are conditional on expectations. Incongruent expectations (low normative and high
189 empirical or vice versa) are interesting as they can tell us if some expectations are more important
190 than others in driving behavior, but in this case we did not focus on this issue. Second, an advantage
191 of using a hypothetical situation with a fictitious character is that it moderates demand effects that
192 are common with direct surveys. Third, all respondents were asked in blocks 3 to 6 about their
193 actual level of compliance with the public health guidelines (“did you/are you practicing social
194 distancing/stay at home apart from unavoidable and necessary trips?”) and about their individual
195 normative beliefs (“did/do you believe that one should practice social distancing/staying at
196 home?”). They were also asked about their empirical and normative expectations (“estimate the
197 percentage of fellow residents who were/are practicing social distancing/staying at home
198 before/since the countrywide Coronavirus (COVID-19) lockdown” and “the percentage of fellow
199 residents who believed/believe that one should practice social distancing/stay at home apart from
200 unavoidable and necessary trips before/since the countrywide Coronavirus (COVID-19)
201 lockdown”). This allows us to compare the outcome of the survey experiment (likelihood of
202 compliance) with the levels of compliance as self-reported by the same individuals in blocks 3 to
203 6. As we elicit the empirical and normative expectations of all individuals, we can also check how
204 reliable the link between expectations (exogenously imposed in the vignette experiment) with
205 individuals holding the same expectations (endogenously reported by them). This comparison
206 serves as a robustness check. As individuals are randomly assigned to one of four conditions in the
207 vignette experiment, we believe it is hard to associate any result with the rationalization of previous
208 responses.

209 In order to assess the interaction between trust and compliance, we asked participants about
210 their general level of trust (using the binary question used by the World Value Survey) and about
211 their individual level of trust in people from different groups, using a 1-4 scale (from “Not at all”
212 to “Completely”). The list of groups includes scientists, the government, and other categories (such
213 as families, neighbors, the police, and medical doctors). We will focus on trust in government and
214 scientists. For the sake of exposition, we will be transforming the 1-4 scale in a binary one, with
215 levels 1-2 associated to low levels of trust (Low trust takes the value of 0) and levels 3-4 to high
216 levels of trust (High trust takes the value of 1). Similar, almost identical, results are obtained when
217 using the 1-4 scale. Descriptive statistics for trust are in Table S2 in the supporting materials.

218 **Results**

220 Table 1 presents data on behavior, normative beliefs and empirical and normative
221 expectations, before and after the lockdown was introduced in each country. At the aggregate level
222 ($n = 11,558$), self-reported compliance before the lockdown (73% and 74% with social distancing
223 and staying at home, respectively) is high but consistent with the proportion of participants
224 supporting the safety measures (76% and 73%). Empirical expectations about others practicing
225 social distancing and staying at home (45% and 45%) and normative expectations about other
226 people’s normative beliefs (47% and 46%) indicate that most participants think others to be far less

227 compliant or convinced about the necessity of the measures than themselves. Table S3 in the
228 Supporting Materials shows the same data at the country level.

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Table 1: Behavior, normative beliefs and expectations

| | Social distance | Stay home |
|-------------------------------|------------------|------------------|
| Before the lockdown | | |
| Behavior (%) | 0.74 | 0.73 |
| Normative belief (%) | 0.76 | 0.73 |
| Empirical expectation (0-100) | 44.76 (28.58) | 44.99 (29.42) |
| Normative expectation (0-100) | 46.51 (29.84) | 45.79 (30.09) |
| After the lockdown | | |
| Behavior (%) | 0.97 | 0.95 |
| Normative belief (%) | 0.96 | 0.94 |
| Empirical expectation (0-100) | 70.46 (22.72) | 69.75 (22.94) |
| Normative expectation (0-100) | 72.07 (22.72) | 71.17 (23.04) |
| Change (%) | | |
| Behavior | 0.22 | 0.23 |
| Normative belief | 0.20 | 0.22 |

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After the lockdown, the reported measures for individual behaviors and support for the safety measures are very high (95% and 97% compliance, 96% and 94% normative beliefs). We cannot discard a bias in the way respondents answered these questions. Empirical and normative expectations are still well below individual behaviors and normative beliefs (70% and 72% for social distancing, 70% and 71% for staying at home). Table S4 in the Supporting Materials presents the same data at the country level. Compliance with the two prescribed behaviors are highly correlated (correlation coefficients at the country level between .38 and .75 before the lockdown and between .28 and .63 after the lockdown), and personal normative beliefs are strongly and positively correlated (between .48 and .74 before, between .29 and .64 after). Overall, only 19% of our respondents complied with one behavior but not the other before the lockdown (13% after the lockdown).

The introduction of a lockdown caused more than a fifth of all participants to report a shift in their behavior and beliefs towards compliance, as presented in the bottom part of Table 1. This proportion significantly varies across countries, following the very different starting level of compliance (e.g. only 9% more people practice social distancing in South Korea, versus 34% in Spain). Changes in normative beliefs also vary in magnitude (9% increase in favor of staying at home in Mexico, versus 34% in the UK). A majority of respondents reacts strongly and positively to the introduction of lockdown adapting their normative and empirical expectations (see Figure A1 in the Supporting Materials, with the proportion of individuals improving their expectations).

Our experimental data are presented in Table 2 and we present a similar analysis at the country level in Table S5 (Supporting Materials). Compliance with the two prescribed behaviors are highly correlated (correlation coefficients at the country level are between .81 and .92). When asked to indicate the vignette character's likelihood of compliance with social distancing and staying at home on a 1-10 Likert scale, our pool strongly condition behavior to the expectations

257 described in the vignette, with substantial differences between congruent social expectations (High
 258 Normative – High Empirical or Low Normative – Low Empirical) and minor ones between
 259 incongruent expectations (High Normative – Low Empirical, Low Normative – High Empirical).
 260 While compliance goes up by 55% in High – High relative to Low – Low (and of a similar
 261 magnitude in the nine countries studied), differences between incongruent vignettes is only 5% (and
 262 not systematic across the nine countries, as the erratic path of ordering and significance in Table S5
 263 shows).

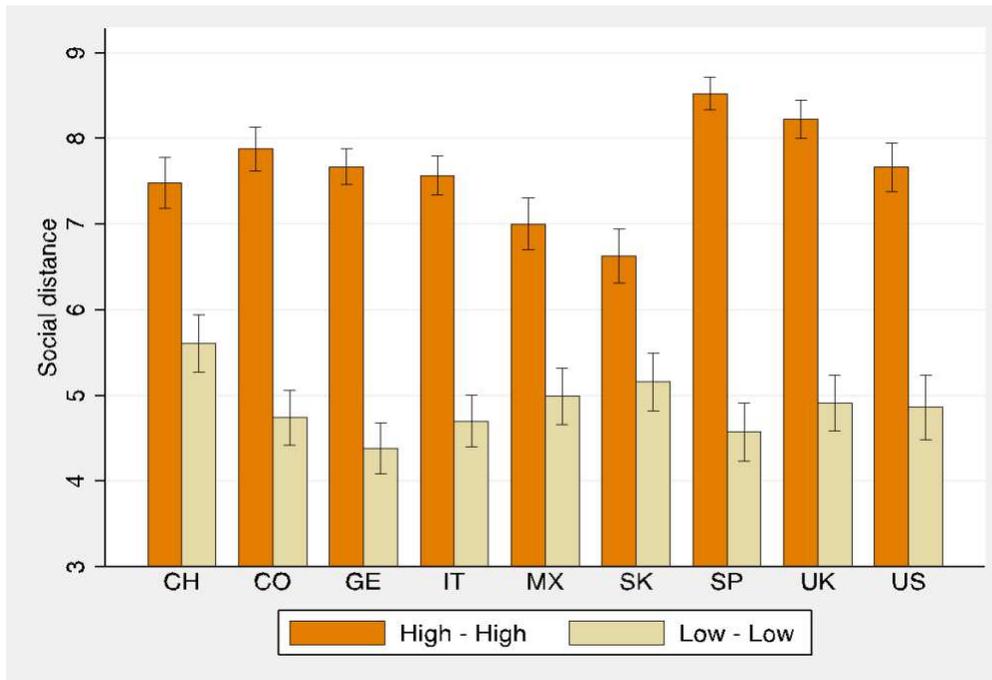
264 **Table 2:** Experimental outcomes

| | High/High | High/Low | Low/High | Low/Low |
|-------------------|----------------|----------------|----------------|----------------|
| Stay home | 7.57 (2.34) | 6.06 (2.67) | 5.77 (2.70) | 4.93 (2.95) |
| Social distancing | 7.63 (2.37) | 6.08 (2.65) | 5.78 (2.71) | 4.88 (2.94) |

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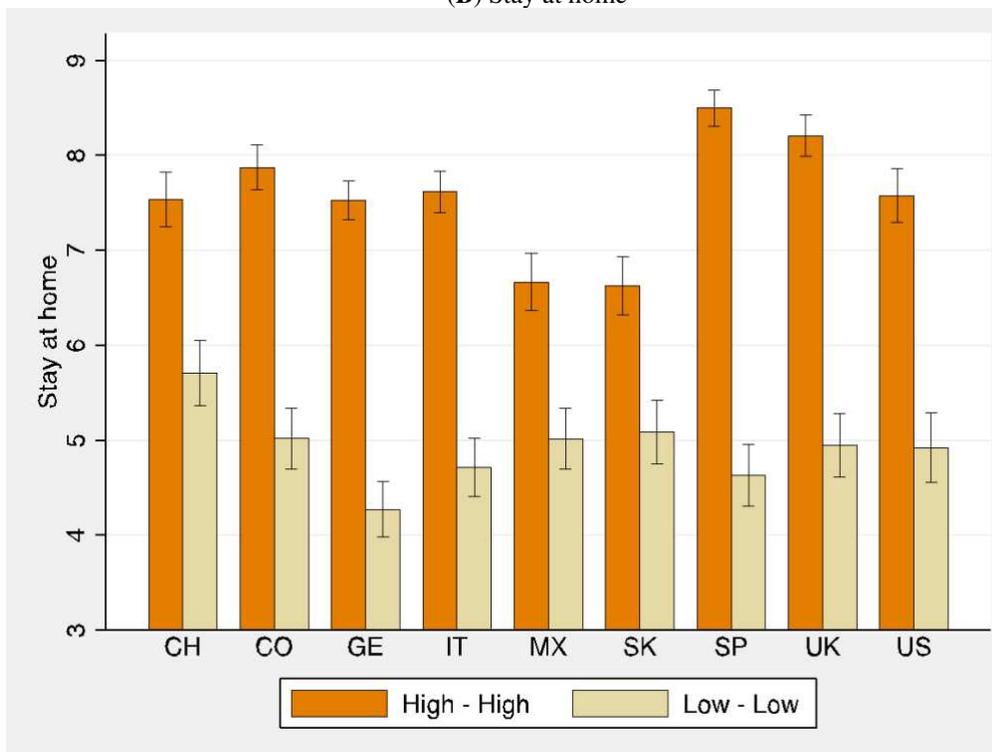
268 Figure 1 compares the compliance decisions made by our participants in the hypothetical
 269 vignette in congruent conditions (High – High and Low – Low), showing how they condition
 270 compliance decisions on the empirical and normative expectations of the vignette (Figure S2
 271 presents the same comparison across the four experimental conditions). Every single pairwise
 272 comparison is significant at the 0.1% level, and vast, from the 29% (30%) compliance increase in
 273 social distancing (and staying at home) in South Korea to the 86% (83%) compliance increase in
 274 Spain.

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(A) Social distance (experimental outcome)

(B) Stay at home



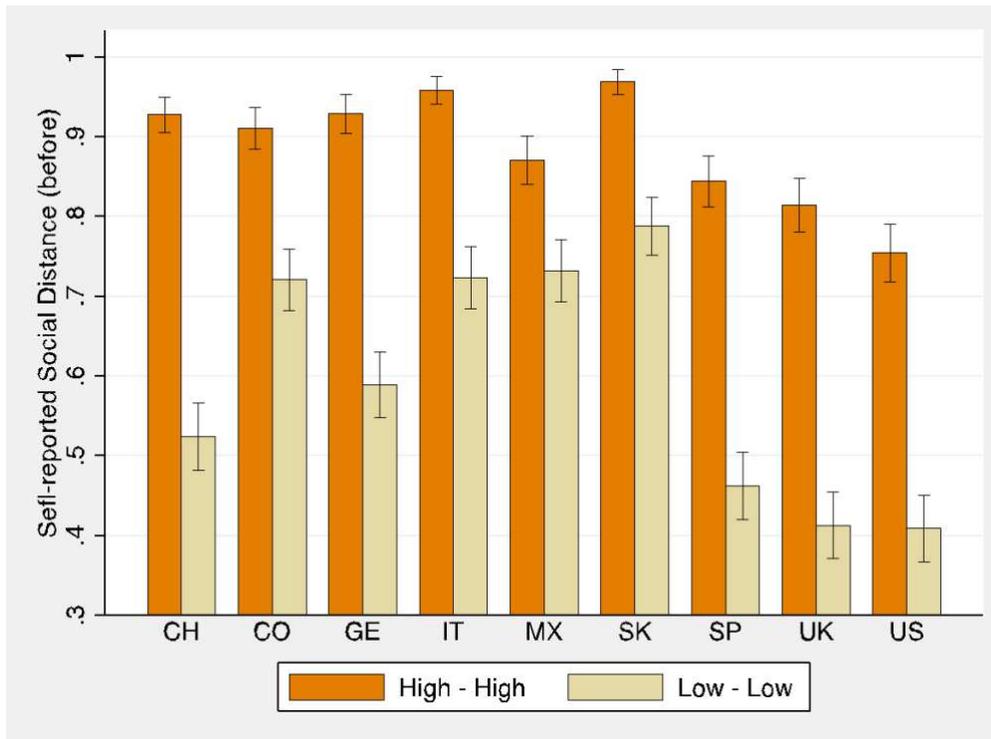
(B) Stay at home.

Figure 1: The new social norms.

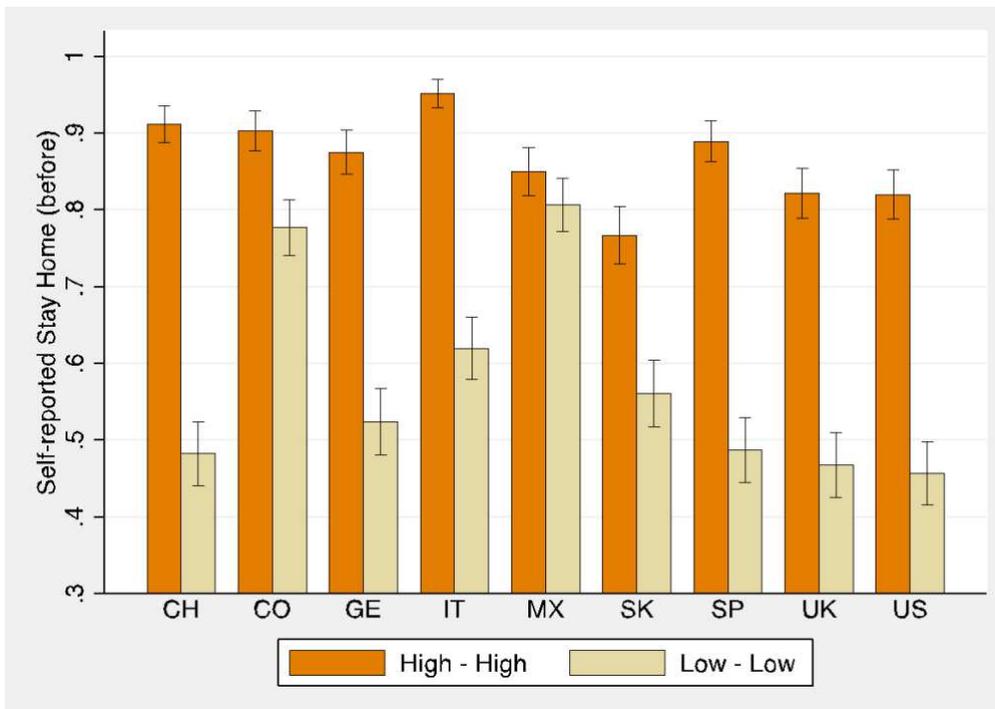
As Figure 1 captures compliance in a hypothetical scenario, in which respondents are asked to imagine a similar country to the one they live in, suffering similarly from the COVID-19 pandemic, we run a simple robustness check. As noted above, participants in our survey experiment also self-reported their level of compliance before and after the lockdown. We look at how

288 participants in our survey experiment condition their self-reported compliance on their expectations
289 in Figure 2. We split each country's sample by their level of expectations. Those participants with
290 high empirical expectations (above the country median) and high normative expectations (again,
291 above the country median) share the optimistic expectations of all participants in the High – High
292 condition in the vignette experiment. Participants below the median empirical and normative
293 expectations are our control group for the Low – Low condition.

294 While expectations are exogenously and randomly imposed on participants in each
295 condition in the vignette experiment, expectations are endogenous when self-reporting compliance
296 before and after the lockdown. Moreover, all participants self-report their compliance first, and then
297 are randomly assigned to one of the four conditions in the vignette experiment, so rationalization
298 of previous decisions cannot explain much. Figure 2 presents the mean compliance before the
299 lockdown, and binomial confidence intervals, of those participants with optimistic expectations
300 (High – High) and pessimistic expectations (Low – Low), leaving aside those holding incongruent
301 expectations (High – Low or Low – High, see Figure S3). Figure 2 generates a very similar message
302 to the one observed in Figure 1. In every country, with the partial exception of Mexico, participants
303 with higher expectations self-report higher levels of compliance, and the comparison is statistically
304 significant at the 0.1% level (two-sided Fisher test p-value is 0.077 for Mexico when self-reporting
305 staying at home).



(A) Social distance



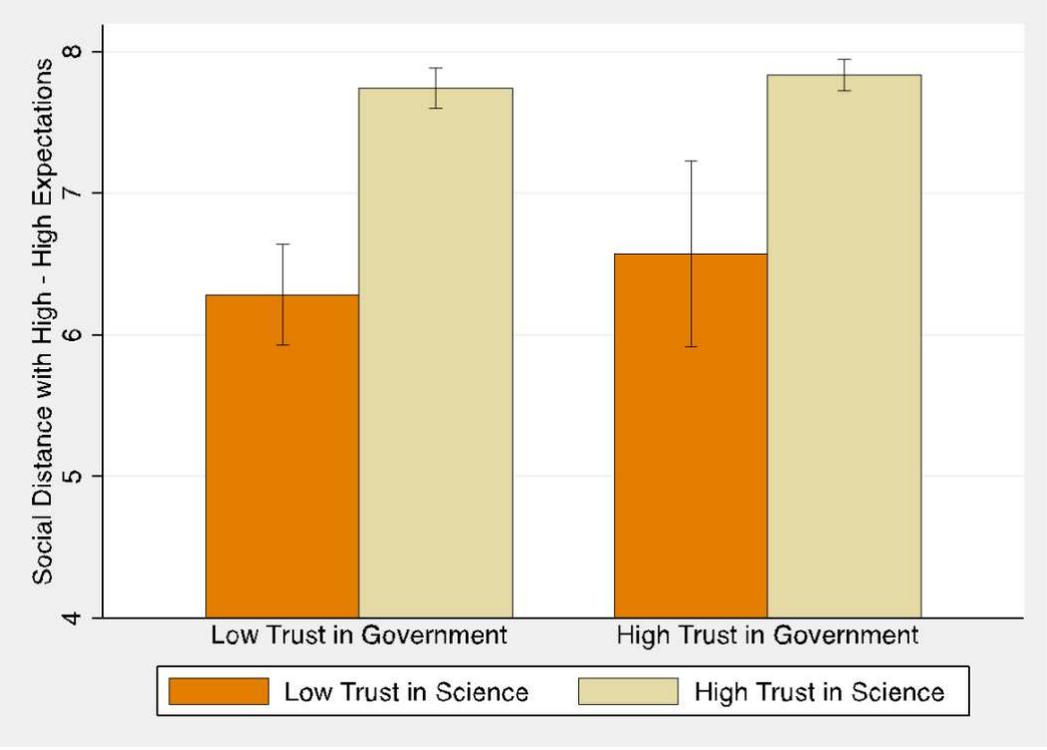
(B) Stay at Home

Figure 2: Self-reported compliance and expectations

What is the mechanism behind the strong connection between compliance and expectations? Figure 3 shows the link between trust in different groups (science and government) and compliance plotting compliance in the vignette experiment, when both expectations are high (High Normative and High Empirical expectations), with bars representing the mean level of compliance and 95% CI added to each bar to facilitate the analysis. In Figure 3, dark orange bars measure compliance

318 for those individuals holding low levels of trust in science, light khaki bars compliance for those
319 individuals holding high levels of trust in science. In each figure, different bars are created for
320 individuals with low and high trust in government.

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323 **(A) Social distance: High – High**

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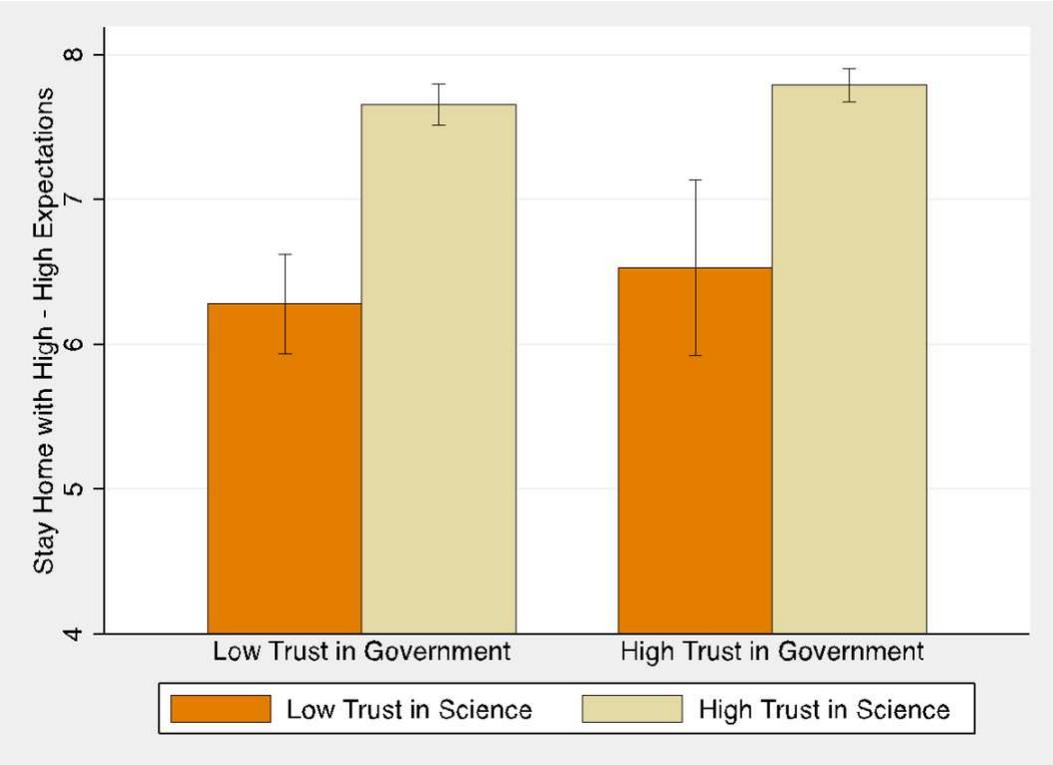
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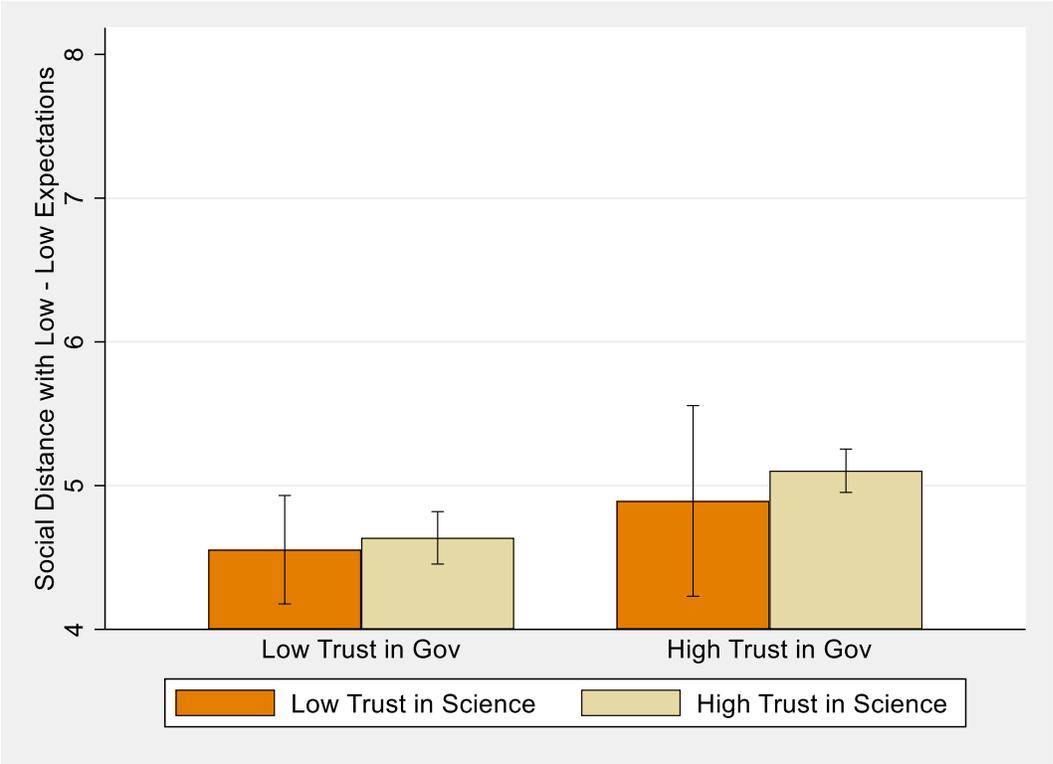
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(B) Social distance: Low – Low



(C) Stay at home: High - High



(D) Stay at home: Low - Low

Figure 3: Social Distance compliance and Trust

We interpret Figure 3 by measuring the impact of trust on compliance. In Figures 3 (a) and (c), with high congruent expectations, compliance is maximized when trust in science is high (every

comparison between the dark orange bar and its corresponding light khaki bar is significant at the 1% level using a Mann Whitney test). Compliance among those holding high levels of trust in government is not significantly higher than compliance among those with low levels of trust in government, regardless of their level of trust in science (if high, p-value=0.3460, if low p-value=0.3596 for social distance; p-value=0.4958 and p-value=0.1778 for stay at home).

When both expectations in the vignette experiment are low, Figure 3 (b) and (d) show a dramatically different picture. Those holding high and low levels of trust in science exhibit very similar levels of compliance when expectations are low (p-values are 0.6305, 0.5761, 0.7815 and 0.2753 for high and low levels of trust in government, and social distance and staying at home). When expectations are low, compliance is significantly higher among those with high levels of trust in government only when trust in science is also high (p-values 0.0001 and 0.0000 for social distance and staying at home), but not when trust in science is low (p-values are 0.3313 and 0.7892).

Figure S4 in the Supporting Materials ranks countries by their level of trust in science and trust in government and plots the country's average compliance for social distance. Figure S4 confirms the results of our previous analysis: When expectations are high, the country level correlation between compliance and trust in science is strong and positive, but weakly negative for trust in government. When expectations are low, we observe a positive correlation between trust in government and compliance and no correlation for trust in science.

We again check whether self-reported compliance follows the pattern described above in Table 3, showing the proportion of participants with self-reported full compliance (both practicing social distance and staying at home) by their level of trust in science and government, when both expectations are either high or low (leaving aside those with incongruent expectations). Before the lockdown, when expectations are low, compliance does not improve when comparing participants with low and high levels of trust in science or government (it actually goes down by 9% and 7%). However, when expectations are high, high trust in science increases compliance by 76% (and high trust in government only by 29%). This big jump is not only significant using a Pearson Chi2 test, but large, and in line with the results observed in the vignette experiment. A similar result can be obtained when looking at compliance levels after the lockdown: modest effects with low expectations (13% increase for high level of trust in science, and 2% for high levels of trust in the government) and large and very different effects when expectations are high (+127% for trust in Science and +36% for trust in government). Table S6 confirms this result by reporting the marginal effects of a probit estimation with individual and country controls.

Table 3: Self-reported compliance and Trust

| Before | Trust in Science | | Trust in Government | | | |
|----------|------------------|----------|---------------------|--------|---------|--------|
| | Low | High | Low | High | High | |
| Low Exp | 0.4980 | -9%* | 0.4536 | 0.4782 | -7%** | 0.4427 |
| High Exp | 0.4704 | +76%*** | 0.8301 | 0.6564 | +29%*** | 0.8437 |
| After | Low | High | Low | High | High | |
| Low Exp | 0.8161 | +13%*** | 0.9205 | 0.8956 | +2%* | 0.9119 |
| High Exp | 0.4331 | +127%*** | 0.9811 | 0.7253 | +36%*** | 0.9846 |

Table 3 shows a clean and policy relevant result: destroying trust in science comes at a very high cost, as even holding high empirical and normative expectations, participants with low levels of trust in science exhibit a very poor level of compliance, as only 43% of them fully comply with the public health guidelines.

382 A main result of our study is that trust in science is needed to achieve the maximum level
383 of compliance. In this respect, it is interesting to compare the effects of trust in science for
384 individuals who hold high versus low expectations. An individual with high expectations of others'
385 compliance will be tempted to free ride, especially if there is doubt about the rationale, and
386 plausibility, of the restrictive measures. The two forces of doubt and the temptation to free ride
387 converge to encourage non-compliance. As the risk of infection is low and the seriousness of the
388 disease is in doubt, the cost of compliance becomes quite high. For people holding low expectations,
389 there is no incentive to free ride, as it is believed that most people do not comply with the policy
390 recommendations. There is, however, a risk in not taking precautions, since infected people are
391 moving around freely. Doubts about science in this case play a minimal role in determining
392 behavior. If the probability of contracting the viral infection is high, whether or not the seriousness
393 of the disease is in doubt, compliance should not be too costly.

394 Our results notably show that having high expectations of compliance is not enough to
395 induce further compliance. This is an important consideration when using norm nudging to foster
396 prosocial behavior. Norm nudging works by providing information about what similarly situated
397 people do or approve of. The assumption is that inducing adequate social expectations will change
398 behavior in a prosocial direction (28). In the case of a public health threat, norm-nudging effects
399 would be nullified by mistrust in science. Norm nudging in this case would work only if
400 accompanied by information that strengthens confidence in the results of scientific research. In
401 particular, it is important that governments and scientists do not send discordant information,
402 creating uncertainty and skepticism about the right measures to adopt.

403 A further question is whether trust in government plays a role in increasing compliance with
404 public recommendations. In line with recent work on the legitimacy of public policies (29, 30),
405 when expectations of compliance are high, trust in government is irrelevant, what really matters is
406 only trust in science. When expectations are low, trust in government has only secondary
407 importance. This highlights the importance of fostering trust in science, rather than fostering trust
408 in government, in order to ensure the effectiveness of norm nudging in increasing compliance with
409 public health recommendations.

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415 **Supplementary Materials**

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Table S1: Demographics and coronavirus attitudes and exposure

| | CH | CO | GE | IT | MX | SK | SP | UK | US |
|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Observations | 1,239 | 1,286 | 1,253 | 1,271 | 1,377 | 1,218 | 1,259 | 1,294 | 1,361 |
| Female (%) | 0.47 | 0.51 | 0.50 | 0.51 | 0.52 | 0.48 | 0.49 | 0.51 | 0.49 |
| Urban (%) | 0.66 | 0.88 | 0.31 | 0.38 | 0.74 | 0.56 | 0.75 | 0.29 | 0.38 |
| Age | 39.27 | 40.75 | 44.65 | 49.80 | 34.90 | 41.28 | 45.67 | 49.36 | 46.82 |
| | (12.20) | (16.49) | (16.22) | (16.39) | (13.50) | (16.93) | (16.02) | (17.95) | (17.66) |
| Income (1-9) | 8.05 | 4.11 | 5.74 | 5.00 | 5.78 | 6.58 | 5.39 | 4.87 | 5.79 |
| | (2.06) | (2.31) | (2.22) | (2.29) | (2.86) | (2.75) | (2.33) | (2.33) | (2.83) |
| Exposure | 0.20 | 0.11 | 0.18 | 0.31 | 0.11 | 0.12 | 0.59 | 0.24 | 0.30 |
| | (0.40) | (0.32) | (0.39) | (0.46) | (0.31) | (0.33) | (0.49) | (0.42) | (0.46) |
| Relocated | 0.06 | 0.00 | 0.01 | 0.02 | 0.03 | 0.09 | 0.02 | 0.04 | 0.14 |
| | (0.24) | (0.07) | (0.12) | (0.13) | (0.16) | (0.28) | (0.13) | (0.20) | (0.34) |
| Individual (1-11) | 3.98 | 4.09 | 5.32 | 4.34 | 3.87 | 3.66 | 5.59 | 5.25 | 4.99 |
| | (2.78) | (2.56) | (2.52) | (2.46) | (2.62) | (2.72) | (2.51) | (2.50) | (3.00) |
| Family (1-11) | 4.17 | 4.66 | 5.64 | 4.49 | 4.24 | 3.93 | 6.23 | 5.81 | 5.36 |
| | (2.86) | (2.69) | (2.55) | (2.53) | (2.67) | (2.66) | (2.57) | (2.64) | (3.01) |
| Overall (1-11) | 6.09 | 7.04 | 6.45 | 6.93 | 5.71 | 4.67 | 7.56 | 6.38 | 6.19 |
| | (3.01) | (2.33) | (2.24) | (2.26) | (3.13) | (2.78) | (2.02) | (2.13) | (2.59) |
| Optimistic bias | 0.67 | 0.82 | 0.55 | 0.77 | 0.54 | 0.50 | 0.68 | 0.52 | 0.51 |
| | (0.47) | (0.38) | (0.50) | (0.42) | (0.50) | (0.50) | (0.47) | (0.50) | (0.50) |
| Economy first | 0.14 | 0.05 | 0.13 | 0.09 | 0.15 | 0.14 | 0.06 | 0.09 | 0.16 |
| | (0.35) | (0.22) | (0.34) | (0.29) | (0.35) | (0.35) | (0.24) | (0.28) | (0.37) |

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Table S2: Trust – Country level

| | CH | CO | GE | IT | MX | SK | SP | UK | US |
|------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Trust WVS | 0.61 (0.49) | 0.07 (0.25) | 0.41 (0.49) | 0.16 (0.36) | 0.08 (0.27) | 0.30 (0.46) | 0.33 (0.47) | 0.48 (0.49) | 0.36 (0.48) |
| Family | 3.73 (0.54) | 3.51 (0.83) | 3.68 (0.74) | 3.69 (0.72) | 3.29 (1.01) | 3.53 (0.72) | 3.71 (0.73) | 3.50 (0.88) | 3.23 (1.03) |
| Neighbors | 3.02 (0.64) | 2.40 (0.83) | 2.84 (0.80) | 2.77 (0.74) | 2.25 (0.83) | 2.81 (0.67) | 2.85 (0.80) | 2.78 (0.80) | 2.62 (0.89) |
| Juniors | 2.78 (0.75) | 2.09 (0.78) | 2.42 (0.76) | 2.44 (0.79) | 2.11 (0.82) | 2.32 (0.73) | 2.58 (0.87) | 2.36 (0.75) | 2.35 (0.88) |
| Seniors | 2.77 (0.74) | 2.75 (0.97) | 2.78 (0.76) | 2.67 (0.85) | 2.70 (1.01) | 2.47 (0.76) | 2.89 (0.96) | 2.85 (0.83) | 2.78 (0.95) |
| Doctors | 3.48 (0.69) | 3.30 (0.89) | 3.18 (0.80) | 3.51 (0.78) | 3.13 (1.03) | 3.18 (0.79) | 3.62 (0.77) | 3.26 (0.89) | 3.04 (1.00) |
| Scientists | 3.38 (0.68) | 3.23 (0.89) | 3.06 (0.83) | 3.30 (0.83) | 3.07 (1.04) | 3.04 (0.78) | 3.51 (0.80) | 3.08 (0.88) | 2.98 (1.00) |
| WHO | 3.29 (0.74) | 2.93 (0.95) | 2.85 (0.88) | 2.97 (0.93) | 2.96 (1.05) | 2.49 (0.90) | 3.02 (0.93) | 2.91 (0.91) | 2.74 (1.09) |
| Government | 3.42 (0.75) | 2.11 (0.99) | 2.72 (0.93) | 2.56 (0.97) | 2.04 (0.95) | 2.65 (0.88) | 2.09 (1.01) | 2.48 (0.92) | 2.30 (0.98) |

425 All measures are on a 1-4 scale, where 1 is the lowest level of trust and 4 is the highest, except the Trust question that
426 is used in the World Values Survey, which takes a value of 1 if people say they can generally trust others and 0 if not.

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Table S3: Before the lockdown – Country level

| | CH | CO | GE | IT | MX | SK | SP | UK | US |
|-------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Behavior | | | | | | | | | |
| Social distancing | 0.74 (0.44) | 0.81 (0.39) | 0.76 (0.43) | 0.85 (0.36) | 0.80 (0.40) | 0.88 (0.33) | 0.64 (0.48) | 0.62 (0.49) | 0.60 (0.49) |
| Stay home | 0.71 (0.46) | 0.84 (0.37) | 0.71 (0.45) | 0.79 (0.40) | 0.83 (0.38) | 0.67 (0.47) | 0.68 (0.47) | 0.65 (0.48) | 0.65 (0.48) |
| Normative belief | | | | | | | | | |
| Social distancing | 0.71 (0.46) | 0.87 (0.34) | 0.77 (0.42) | 0.84 (0.37) | 0.85 (0.35) | 0.88 (0.33) | 0.73 (0.44) | 0.64 (0.48) | 0.59 (0.49) |
| Stay home | 0.70 (0.46) | 0.88 (0.33) | 0.69 (0.46) | 0.73 (0.44) | 0.86 (0.35) | 0.80 (0.40) | 0.72 (0.45) | 0.61 (0.49) | 0.59 (0.49) |
| Empirical expectations | | | | | | | | | |
| Social distancing | 52.88 (31.79) | 47.81 (30.60) | 47.03 (26.96) | 44.91 (24.58) | 41.61 (21.56) | 58.40 (25.92) | 36.89 (29.72) | 33.77 (26.72) | 39.86 (29.61) |
| Stay home | 51.91 (33.21) | 56.39 (32.47) | 43.79 (26.89) | 42.72 (26.33) | 42.27 (21.45) | 54.66 (26.62) | 36.49 (30.93) | 34.95 (27.68) | 41.77 (29.56) |
| Normative expectations | | | | | | | | | |
| Social distancing | 52.59 (32.69) | 53.43 (32.63) | 48.16 (27.31) | 46.16 (26.98) | 43.84 (24.94) | 58.59 (27.00) | 38.99 (29.91) | 36.21 (28.53) | 40.89 (30.36) |
| Stay home | 52.40 (33.18) | 54.80 (32.91) | 45.34 (27.34) | 44.54 (27.93) | 43.51 (24.39) | 56.05 (27.85) | 38.15 (30.08) | 36.13 (28.85) | 41.37 (30.54) |

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Table S4: After the lockdown – Country level

| | CH | CO | GE | IT | MX | SK | SP | UK | US |
|-------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Behavior | | | | | | | | | |
| Social distancing | 0.97 (0.17) | 0.99 (0.11) | 0.94 (0.24) | 0.99 (0.08) | 0.94 (0.25) | 0.96 (0.20) | 0.99 (0.08) | 0.98 (0.15) | 0.94 (0.23) |
| Stay home | 0.96 (0.19) | 0.97 (0.17) | 0.87 (0.34) | 0.99 (0.09) | 0.92 (0.27) | 0.93 (0.26) | 0.99 (0.11) | 0.97 (0.16) | 0.92 (0.27) |
| Normative belief | | | | | | | | | |
| Social distancing | 0.97 (0.17) | 0.99 (0.10) | 0.91 (0.29) | 0.98 (0.12) | 0.96 (0.19) | 0.95 (0.21) | 0.99 (0.12) | 0.97 (0.17) | 0.92 (0.27) |
| Stay home | 0.95 (0.21) | 0.98 (0.14) | 0.85 (0.36) | 0.97 (0.16) | 0.95 (0.22) | 0.94 (0.25) | 0.98 (0.14) | 0.95 (0.21) | 0.91 (0.29) |
| Empirical expectations | | | | | | | | | |
| Social distancing | 80.27 (20.24) | 68.54 (26.32) | 70.25 (18.38) | 70.84 (17.69) | 49.98 (20.53) | 68.89 (23.46) | 82.18 (18.77) | 75.90 (19.57) | 67.75 (21.98) |
| Stay home | 80.97 (20.34) | 69.76 (27.21) | 66.76 (19.22) | 70.91 (17.00) | 49.12 (20.39) | 68.09 (23.81) | 81.75 (18.53) | 74.25 (19.15) | 66.63 (22.10) |
| Normative expectations | | | | | | | | | |
| Social distancing | 81.16 (20.15) | 70.99 (26.76) | 70.65 (19.25) | 73.03 (17.72) | 53.87 (21.78) | 70.30 (23.59) | 82.95 (18.92) | 76.82 (19.66) | 69.30 (22.17) |
| Stay home | 81.69 (20.01) | 71.26 (27.02) | 66.94 (19.11) | 72.21 (18.16) | 54.59 (22.60) | 68.10 (24.42) | 82.29 (19.38) | 76.02 (19.61) | 67.82 (22.56) |

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Table S5: Experimental outcomes – Country level

| | | High/High | High/Low | Low/High | Low/Low |
|----------------|-------------------|-------------------|-------------------|-------------------|----------------|
| China | Stay home | 7.54*** (2.59) | 6.36* (2.86) | 6.78*** (2.60) | 5.71 (3.05) |
| | Social distancing | 7.49*** (2.65) | 6.38** (2.80) | 6.80*** (2.59) | 5.61 (2.98) |
| Colombia | Stay home | 7.88*** (2.14) | 6.16 (2.64) | 5.80*** (2.82) | 5.02 (2.87) |
| | Social distancing | 7.88*** (2.27) | 6.29** (2.61) | 5.73*** (2.90) | 4.74 (2.85) |
| Germany | Stay home | 7.53*** (1.83) | 5.74** (2.31) | 6.08*** (2.23) | 4.28 (2.64) |
| | Social distancing | 7.67*** (1.83) | 5.73*** (2.31) | 6.29*** (2.18) | 4.39 (2.62) |
| Italy | Stay home | 7.62*** (1.94) | 5.98* (2.46) | 5.62*** (2.46) | 4.72 (2.74) |
| | Social distancing | 7.57*** (2.01) | 5.99** (2.40) | 5.57*** (2.49) | 4.70 (2.68) |
| Mexico | Stay home | 6.67*** (2.74) | 5.44** (2.68) | 4.99 (2.75) | 5.02 (2.85) |
| | Social distancing | 7.00*** (2.70) | 5.48*** (2.67) | 4.94 (2.77) | 4.99 (2.95) |
| South Korea | Stay home | 6.63 (2.72) | 6.29*** (2.94) | 4.98 (2.75) | 5.09 (2.97) |
| | Social distancing | 6.63 (2.81) | 6.47*** (2.99) | 5.09 (2.77) | 5.16 (2.97) |
| Spain | Stay home | 8.50*** (1.65) | 6.01 (2.57) | 5.77*** (2.56) | 4.63 (2.89) |
| | Social distancing | 8.53*** (1.69) | 5.93 (2.47) | 5.69*** (2.57) | 4.57 (2.96) |
| United Kingdom | Stay home | 8.21*** (1.94) | 6.36 (2.50) | 6.16*** (2.57) | 4.95 (3.01) |
| | Social distancing | 8.22*** (1.98) | 6.30 (2.49) | 6.17*** (2.58) | 4.91 (2.90) |
| United States | Stay home | 7.58 (2.53) | 6.18* (2.87) | 5.71*** (2.98) | 4.92 (3.27) |
| | Social distancing | 7.66 (2.53) | 6.15* (2.92) | 5.74*** (3.03) | 4.86 (3.31) |

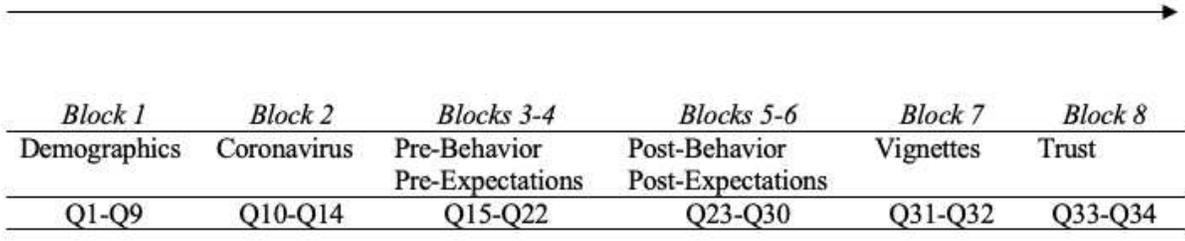
Table S6: Probit Results for Self-reported Compliance

| | (1) Science | (2) Government |
|------------------------------------|-------------------------------------|-------------------------------------|
| <i>Low Trust, Low Expectations</i> | <i>0.6506</i> | <i>0.6493</i> |
| High trust (Low expectations) | -0.0439*** (0.0155) | -0.0283** (0.0115) |
| <i>Predicted</i> | <i>.6067</i> | <i>.6210</i> |
| (Low trust) High expectations | 0.0218 (0.0235) | 0.172*** (0.0133) |
| <i>Predicted</i> | <i>.6724</i> | <i>.8213</i> |
| High trust * High expectations | 0.278*** (0.0205) | 0.164*** (0.0172) |
| <i>Predicted</i> | <i>.9286</i> | <i>.8133</i> |
| <i>Low Expectations: Δ Trust</i> | <i>-4.39pp***</i> <i>(-7%)</i> | <i>-2.83pp**</i> <i>(-4%)</i> |
| <i>High Expectations: Δ Trust</i> | <i>+25.62pp***</i> <i>(+38%)</i> | <i>-0.80pp</i> <i>(-1%)</i> |
| <i>Low Trust: Δ Expectations</i> | <i>+2.18pp</i> <i>(+3%)</i> | <i>+17.2pp***</i> <i>(+26%)</i> |
| <i>High Trust: Δ Expectations</i> | <i>+32.19pp***</i> <i>(+53%)</i> | <i>+19.23pp***</i> <i>(+31%)</i> |
| Individual controls | Yes | Yes |
| Country controls | Yes | Yes |
| Observations | 7,901 | 7,901 |

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

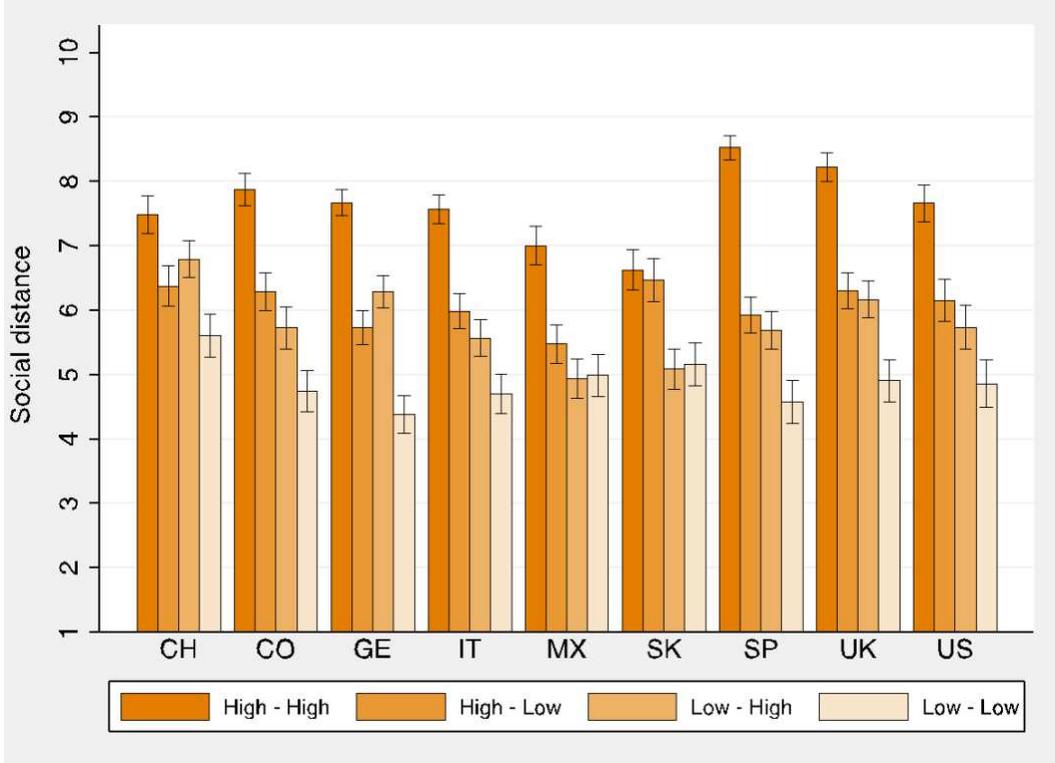
Probit estimations with individual (gender, age, education and location) and country controls, figures are marginal effects, relative to the benchmark (low expectations and low level of trust), using self-reported compliance before the lockdown as dependent variable.

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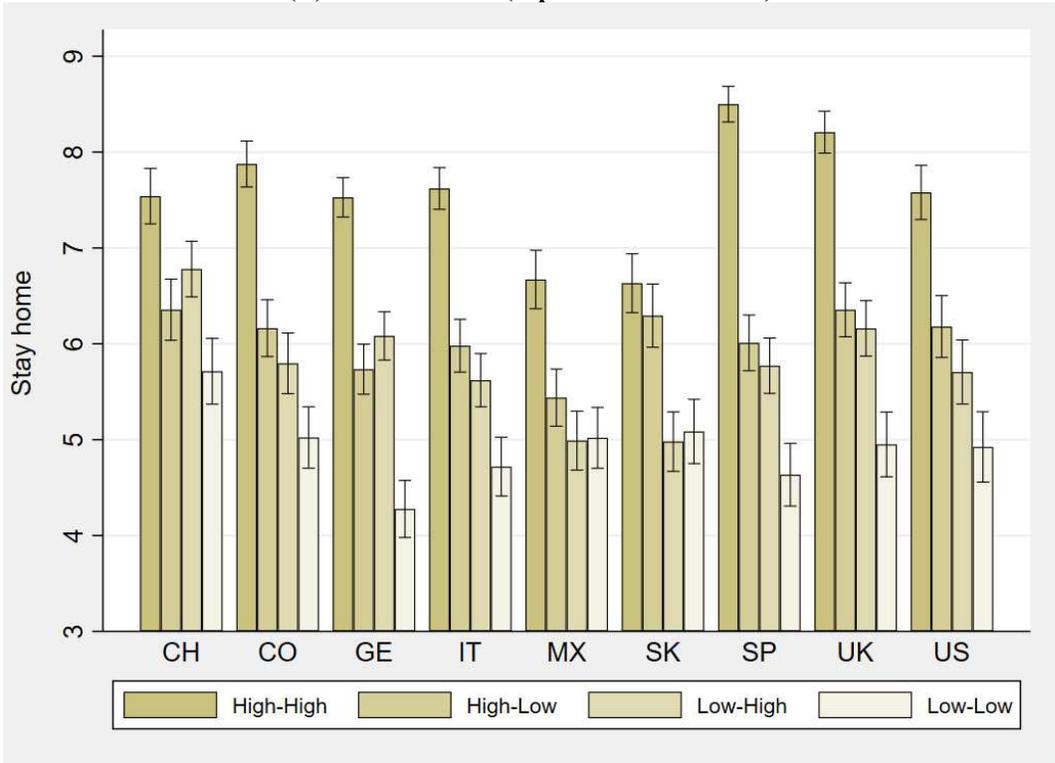
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Figure S1: Survey Sequence



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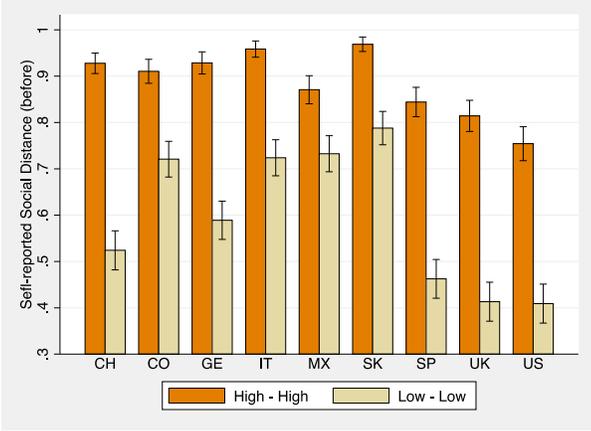
(A) Social distance (experimental outcome)



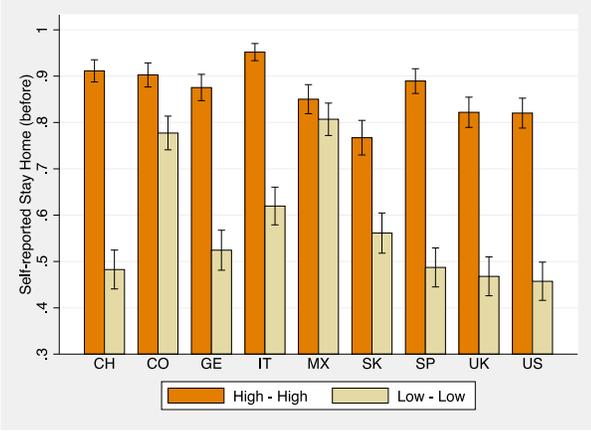
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(B) Stay at home (experimental outcome)

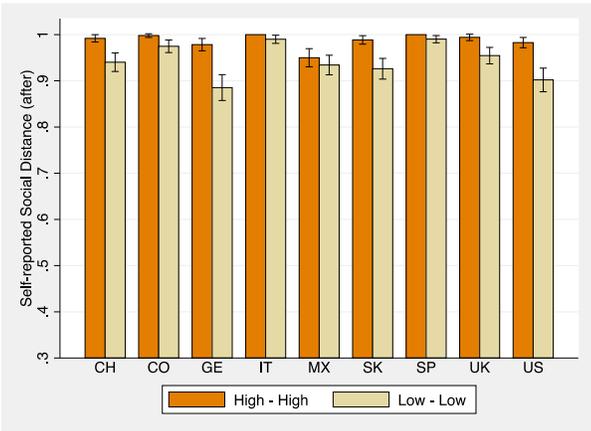
Figure S2: The new social norms



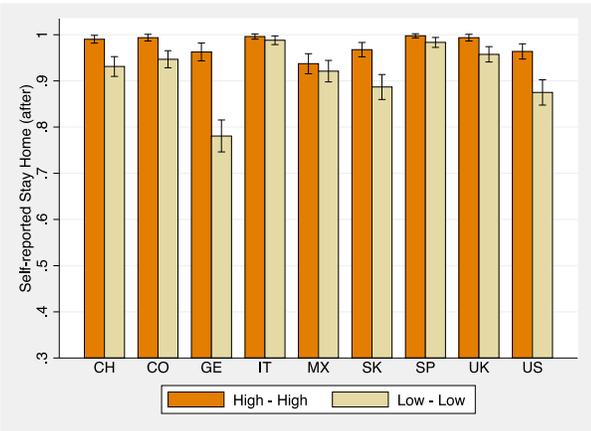
(A) Before the lockdown
Social distance



(B) Before the lockdown
Stay home



(C) After the lockdown
Social distance

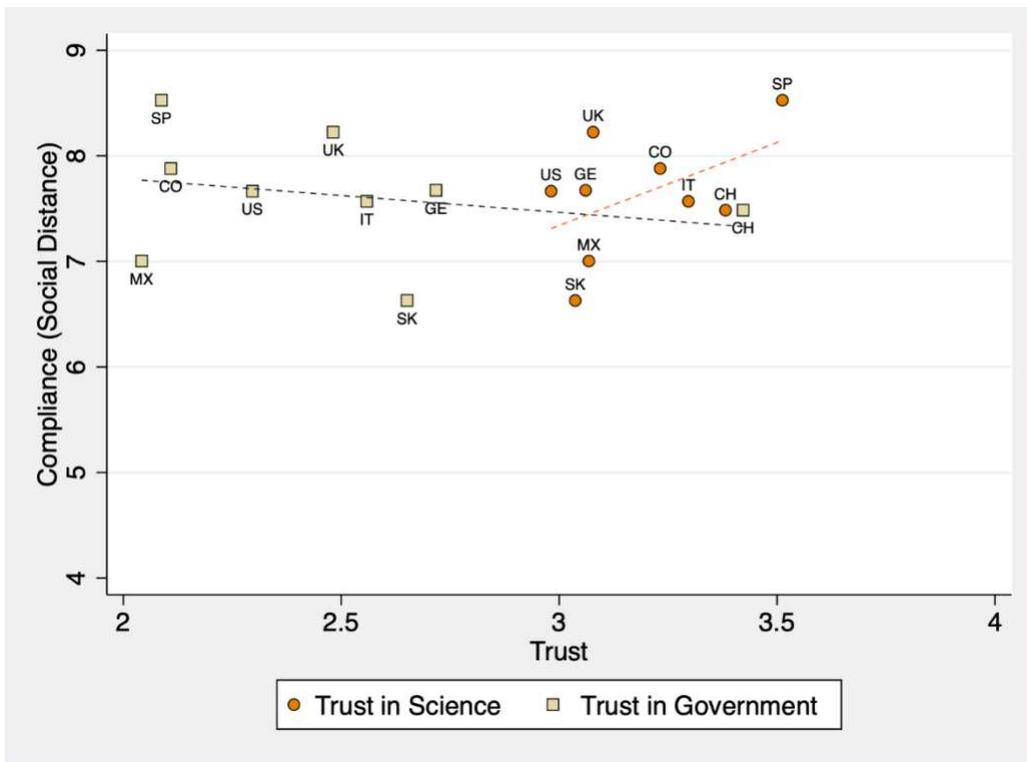


(D) After the lockdown
Stay home

471
472
473
474

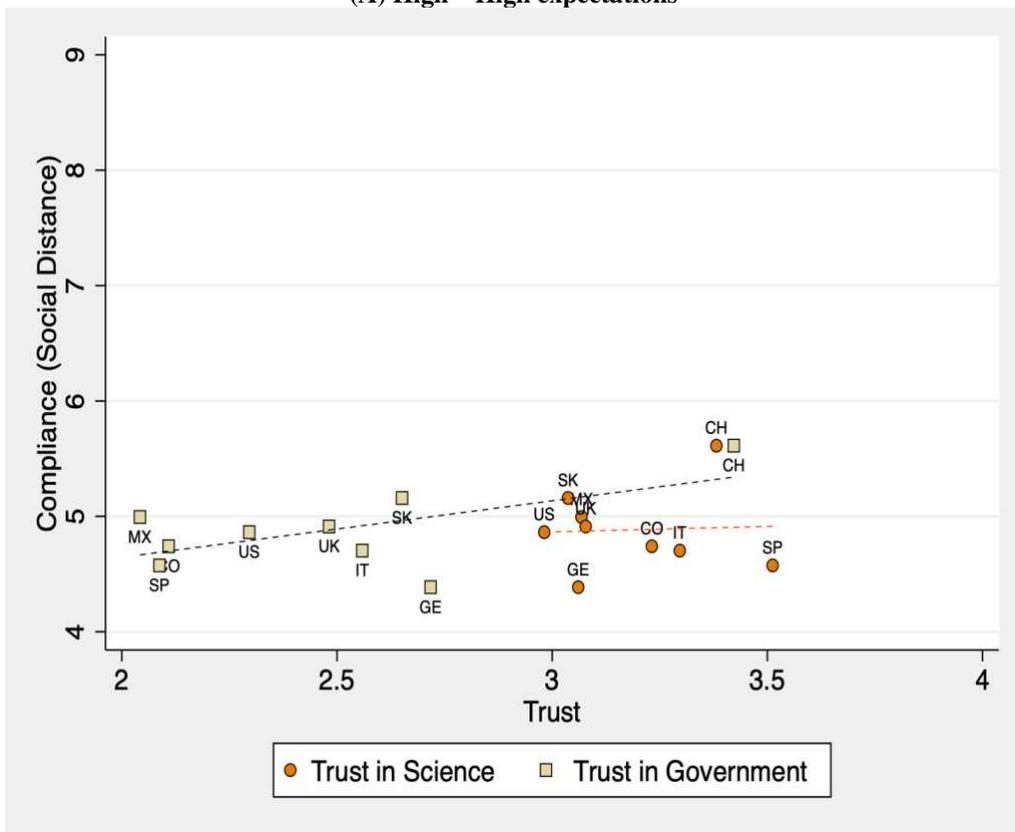
Figure S3: Self-reported compliance
(per the survey, not including incongruent expectations)

475



(A) High – High expectations

476
477

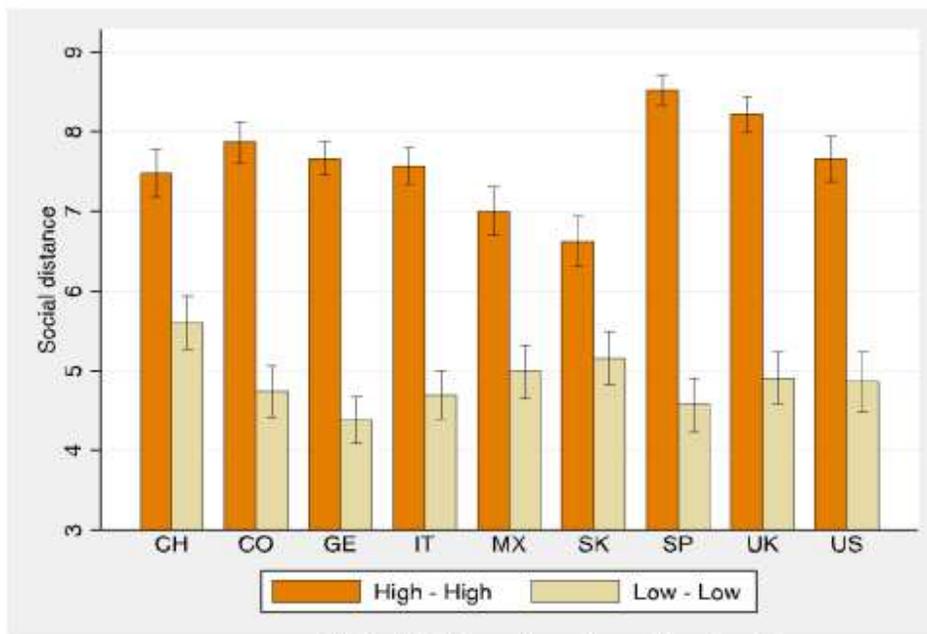


(B) Low – Low Expectations

Figure S4: Out of sample predictions

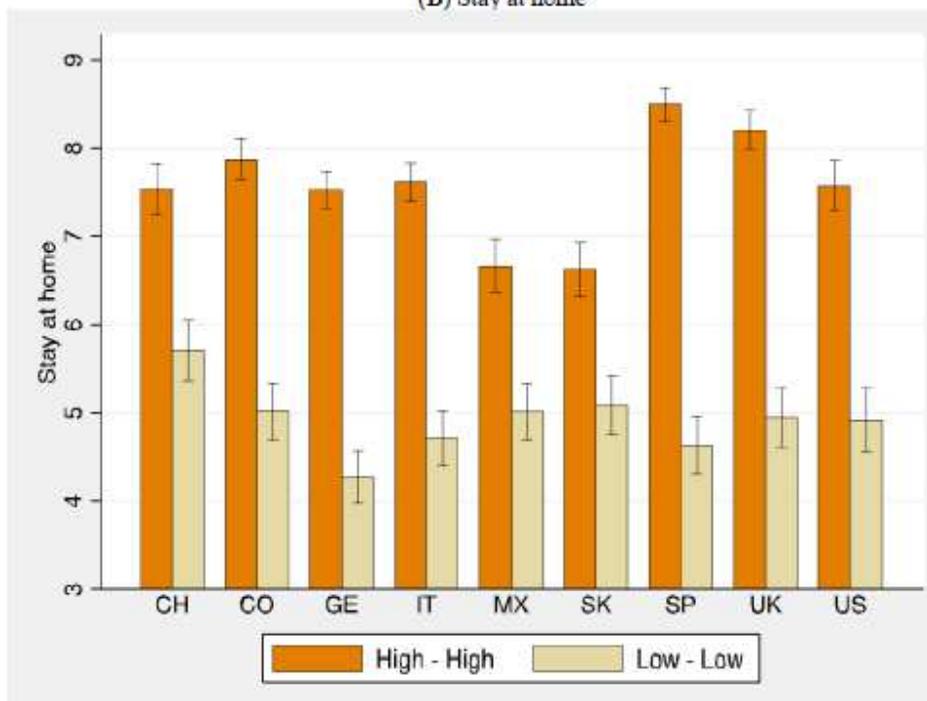
478
479
480
481
482

Figures



(A) Social distance (experimental outcome)

(B) Stay at home

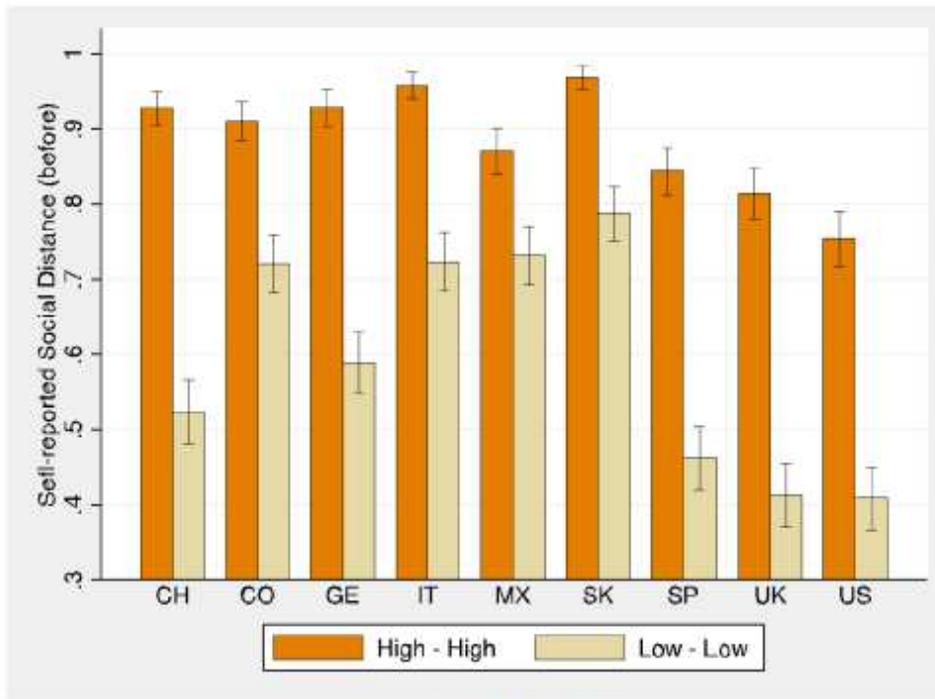


(B) Stay at home.

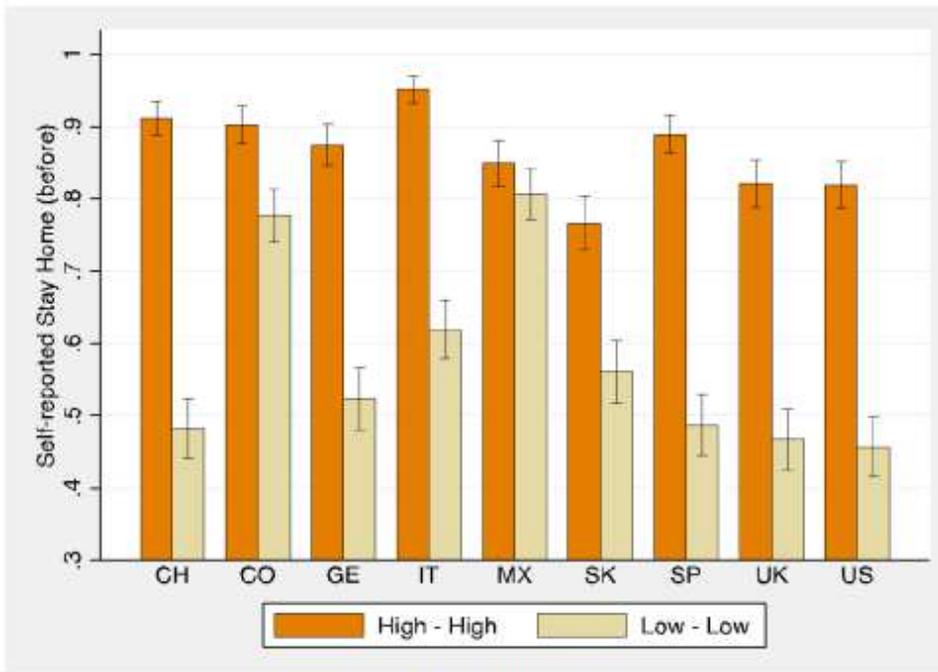
Figure 1: The new social norms.

Figure 1

Caption found in figure.



(A) Social distance

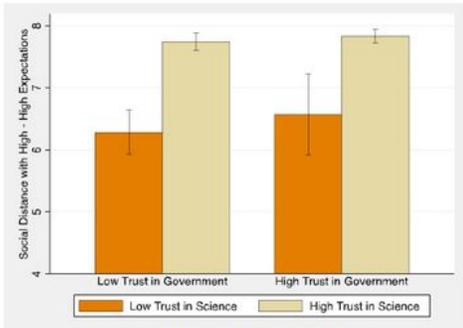


(B) Stay at Home

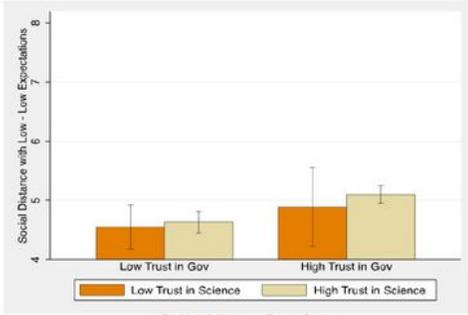
Figure 2: Self-reported compliance and expectations

Figure 2

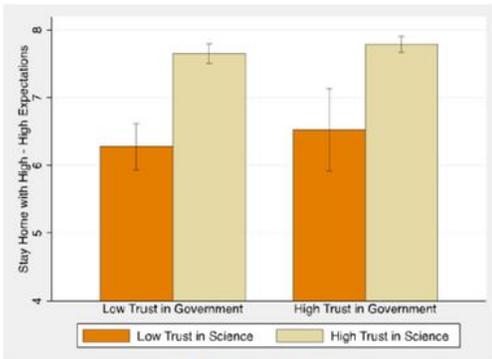
Caption found in figure.



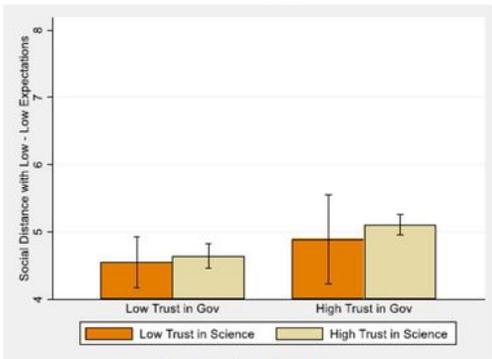
(A) Social distance: High - High



(B) Social distance: Low - Low



(C) Stay at home: High - High



(D) Stay at home: Low - Low

Figure 3: Social Distance compliance and Trust

Figure 3

Caption found in figure.