How Laws Affect the Perception of Norms: Empirical Evidence from the Lockdown*

Roberto Galbiati† Emeric Henry† Nicolas Jacquemet‡ Max Lobeck§

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Abstract

Laws not only affect behavior due to changes in material payoffs, but they may also change the perception individuals have of social norms, either by shifting them directly or by providing information on these norms. Using detailed daily survey data and exploiting the introduction of lockdown measures in the UK in the context of the COVID-19 health crisis, we provide causal evidence that the law drastically changed the perception of the norms regarding social distancing behaviors. We show that this effect of laws on perceived norms is mostly driven by an informational channel and that the intervention made perceptions of social norms converge to the actual prevalent norm.

JEL Classification: K1, I12, I18.

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1 Introduction

Individual behavior is affected both by material incentives, in particular those codified in laws, and by social sanctions or rewards, embodied in norms of behavior. The interactions between

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†Department of Economics, Sciences Po, CNRS and CEPR. , 28 rue des Saints-Pères 75007 Paris, France. roberto.galbiati@sciencepo.fr; emeric.henry@sciencepo.fr

‡Paris School of Economics and University Paris 1 Panthéon-Sorbonne. Centre d'Economie de la Sorbonne, 106 Bd de l'hopital, 75013 Paris, France. nicolas.jacquemet@univ-paris1.fr, max.lobeck@psemail.eu

laws and norms is of growing interest both in law and in economics. Benabou and Tirole (2011) propose a theoretical framework that formalizes two types of interactions. First, laws, by changing material payoffs, affect the norm of behavior understood as an equilibrium object: if fewer people take the condemned actions, the social stigma attached to these actions increases. Second, laws, when there is an underlying uncertainty on the prevailing social norm, provide information on societal values. Both these mechanisms imply a shift in the perceived social norm as the result of the implementation of a law; because the norm did actually change in the first case, and through an informational channel in the second case. Taking into account such interactions between laws and norms is key to understand why policies designed to foster cooperation fail or succeed (see Bowles, 2008; Bowles and Polania-Reyes, 2012, for recent surveys).

In this paper, we take advantage of the lockdown measures introduced to face the Covid-19 pandemic and of rich survey data, gathered by Fetzer et al. (2020) worldwide, to provide causal evidence that laws affect the perception of norms, and disentangle the mechanisms behind the change. Our setting allows us to observe the effects of the law not only on perceived social norms (*i.e.*, ones' beliefs about what others consider appropriate) but also on personal norms (*i.e.*, ones' belief about what is an appropriate behavior). This allows us to build a measure of social norms that we can compare to perceived social norms. We focus on the case of Boris Johnson's announcement of a nation-wide lockdown in the UK in the evening on March 23 2020. This setting has several key features that we can exploit to investigate the causal effect of laws on perceptions of the social norm. First, the implementation of this law came as a relative surprise. Indeed it represented a sharp change in the UK government's strategy that has previously signaled strong reserves regarding total lockdowns. Second, the law was far reaching, including several different policies, such as lockdown and store closures, that had been typically more gradually implemented in other countries.

The law had an immediate impact on mobility, reducing for instance trips to parks by 30% within days. We provide evidence that this strong effect on behavior is supported by changes in perceptions of the social norm. To that end, we examine how the law affected individual's beliefs of whether *other* people believe social-distancing measures are important. We test the causal effect of the lockdown announcement on the perception of social norms by comparing daily responses of individuals that were interviewed before March 23 2020 in the UK with those that were interviewed after March 23 2020 in the UK. Trends in the perception of the social norm are controlled for by looking at the beliefs on the same days for respondents living in a set of control countries. The event study analysis coupled with a difference-in-differences estimation strategy show that the lockdown announcement significantly increased the likelihood that individuals believe that their compatriots view positively staying at home, closing stores, and not participating in social gatherings. The effect is very sizable, representing for instance a 15 percentage points increase in the belief that other people think that stay at home measures should be followed. We show that these results are robust to various identification strategies.

In the second part of the paper, we distinguish the two mechanisms proposed in Benabou and Tirole (2011) that can explain the shift in the perception of social norms. We study the impact of the law on personal norms, *i.e.*, one's own normative view about social distancing measures. First, we show that, before the law was passed, there was a large gap between the social norm (measured as the weighted average personal norm) and the average perception of the social norm, a gap we call misperception. Second, performing the same event study exercise as on the perceived social norm, we show that misperceptions sharply drop after the implementation of the policy. This mostly reflects the fact that personal norms did not themselves shift much. Overall, this suggests that the law mostly acted to provide information on the prevalent social norm, and helped to correct misperceptions about it.

This paper relates to different strands of literature. First it contributes to a literature at the intersection of law and economics, that presents conceptual and theoretical mechanisms through which legal interventions interact with existing social norms. McAdams (2000) is the first study to argue that, when people seek social approval, laws may provide information about prevailing social values. Acemoglu and Jackson (2017) study a context where the effectiveness of laws depends on their coherence with social norms that drive social stigma for illegal behavior. Huck (1998) and Bohnet et al. (2001) take a different approach by studying the effects of laws on social norms in the context of evolutionary preferences adaptation. These papers look at the short and long-run effects of legal rules and point out that they can have long-run effects on behavior because they affect the evolution of preferences. As previously mentioned, in Benabou and Tirole (2011) social norms directly affect the utility of individuals who care about their social image. Laws can, in this context, shift norms since certain behaviors become more rare, and thus more socially frowned upon, but can also bring information on the prevailing norm. Our work provides evidence consistent with the informational channel.

An experimental and empirical literature has examined how laws affect personal norms. A first wave of studies (*e.g.*, McAdams and Nadler, 2008, in a lab coordination game setting, Galbiati and Vertova, 2008; Tyran and Feld, 2006; Galbiati et al., 2018, in the context of social dilemmas and Funk, 2007, in the field) finds that laws affect behavior beyond changing monetary incentives. Most of these studies argue that the findings are consistent with the fact that laws shift personal norms. A second wave of studies provides direct evidence of this effect of laws. Aksoy et al. (2020) show that the legal recognition of same sex unions is associated with a significant improvement in personal norms towards sexual minorities. Using a vignettes experiment, Lane and Nosenzo (2020) show that laws exert an effect on whether people perceive certain behaviors as socially appropriate or not. On the other hand, very few papers examine how laws affect the perception of social norms, with the exception of Tankard and Paluck (2017) and Casoria et al. (2020), which compare perceived social norms before and after the intervention in a single country.

Our work takes a comprehensive approach that goes beyond the scope of the aforementioned literature, since we study the impact of the law on the combination of personal and perceived

norms and in particular study the impact on misperceptions. This enables us to disentangle the mechanisms proposed by Benabou and Tirole (2011).

Finally, our study also contributes to an emerging literature studying change in social norms in response to information provision. Bursztyn et al. (2020b) show that, in Saudi Arabia, individuals misperceive the level of social support of women working outside home and provide experimental evidence that correcting beliefs about others increases married men's willingness to help their wives search for jobs. In a study focusing on the effect of information on the change of xenophobic social norms, Bursztyn et al. (2020a) show that providing information about the constitutionality of a Muslims' bans from public office affects people beliefs about the popularity of the policy. Our analysis shows that the introduction of new laws constitutes a different channel to provide information that corrects misperceptions about the prevailing social norms.

2 Data

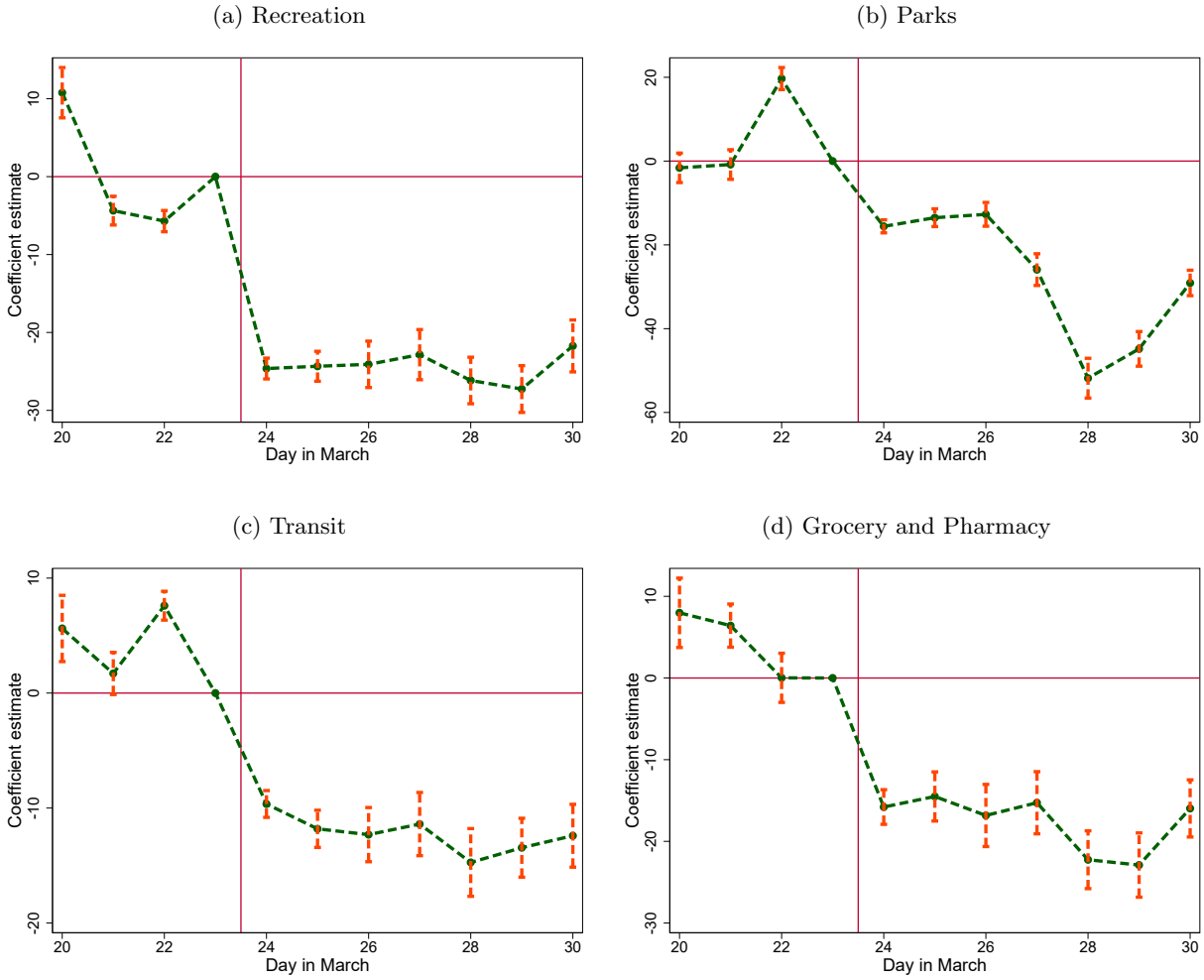
Our data come from a large online survey gathered by Fetzer et al. (2020, henceforth FWH). The survey collects data on individual attitudes and beliefs concerning Covid-19 measures. The survey was launched on March 20 and we use responses up to March 30, resulting in over $99,000$ respondents from up to 58 countries.[1] The data contains daily information on respondents' beliefs about four distinct social distancing measures: social gatherings, avoiding handshakes, closing stores and implementing a general curfew. For each of these measures, respondents are asked about their *perception of the social norm*, specifically whether they believe other individuals in their countries think that these measures should be adopted (see the Online Appendix, Section A, for detailed information about the variables and their definition). We complement this information with external daily country-level data on coronavirus cases and deaths in the respondent's country provided by the John's Hopkins University (Dong et al., 2020).

Boris Johnson's March 23 announcement of a full and immediate lockdown in the UK is our main source of identification.[2] The lockdown prohibited citizens to leave their home except for one form of exercise per day, medical visits, shopping basic necessities, and traveling to and from work if work from home is not possible. It also banned gatherings of more than 2 people and ordered non-essential shops to close. Importantly, this decision marked a stark change in the government's approach to contain the epidemic. Indeed, as late as March 22 the prime minister recommended that individuals stay two meters apart when interacting outdoors, noting that he "want[s] people to be able to go to the parks and open spaces and to enjoy themselves – it is crucial for health and mental and physical wellbeing" (office U.K.-Government, 2020). The government in fact initially suggested that they would aim at achieving herd immunity. The measures also marked a change

[1] Responses are not representative but representativity can be reconstructed using country-specific weights. We include all countries that had more than 200 respondents and completed the survey before March 30. We use the May 21 release of the data, which fixes some issues with the initial weight construction.

[2] The verbatim of the announcement is provided in the Online Appendix, Section A.2.

Figure 1: Mobility patterns in the UK

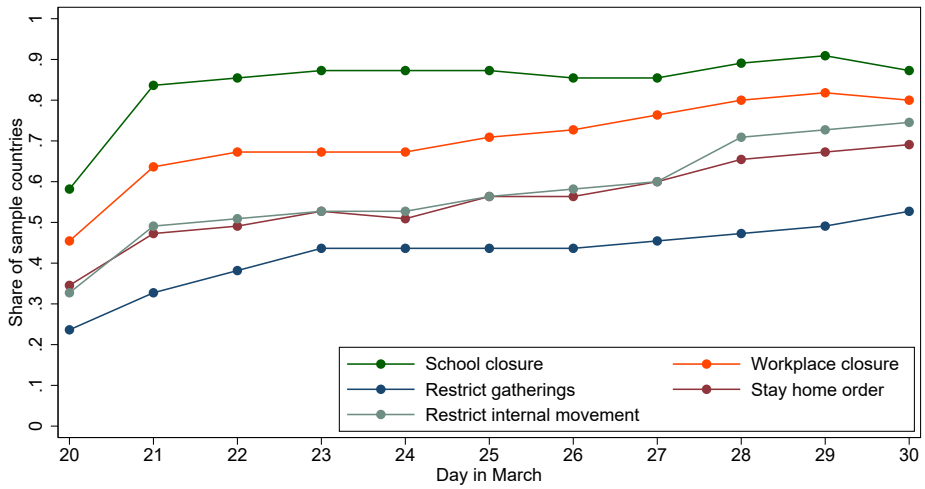


Note. These figures plot the day-fixed effects of a specification that regresses a measure of mobility on days as well as Covid deaths and confirmed cases. The outcome variable is mobility data provided by Google. It characterizes in percent how many individuals spend time in (a) recreational areas, (b) parks, (c) transit, and (d) stores and pharmacy *relative* to a baseline. This baseline is the average number of visit on the same weekday between January 3rd and February 6th. A negative value thus means that there are fewer people at a given place than in the baseline period. The unit of observation is percent and the coefficients have to be interpreted as percentage points.

in policy relative to other countries that did not implement any further restrictions (e.g., Sweden) or that have already implemented such measures on a large scale (e.g., France, see Hale et al., 2020).

It turned out however that the enforcement was not as stringent as in other countries. Over a period of 3 months following the lockdown, less than 16,000 fines for violation were issued (compared to more than a million in France), whereas the fine of 60 pounds was lower than in many other countries (135 Euros in France). The police force had been instructed to favor discussion and education over sanctions. Nevertheless the law had a strong impact on the behavior of the

Figure 2: Timeline of policies implementation in the control group



Note. The figure reports the share of countries in the control group where the corresponding policy was enforced on each day provided on the x-axis.

population. Using Google mobility data and regressing different measures of mobility, controlling for the state of the pandemic in each country, we show in Figure 1 that all types of movements were significantly reduced after March 23rd in the UK, in particular those for recreational purposes.[3] For example, the lockdown reduced time spent in parks by 29 percentage points compared to the average time spent in parks on the same weekday between January 3rd and February 6th. Note that this is the pure effect of the lockdown, controlling for behavioral changes before the lockdown.

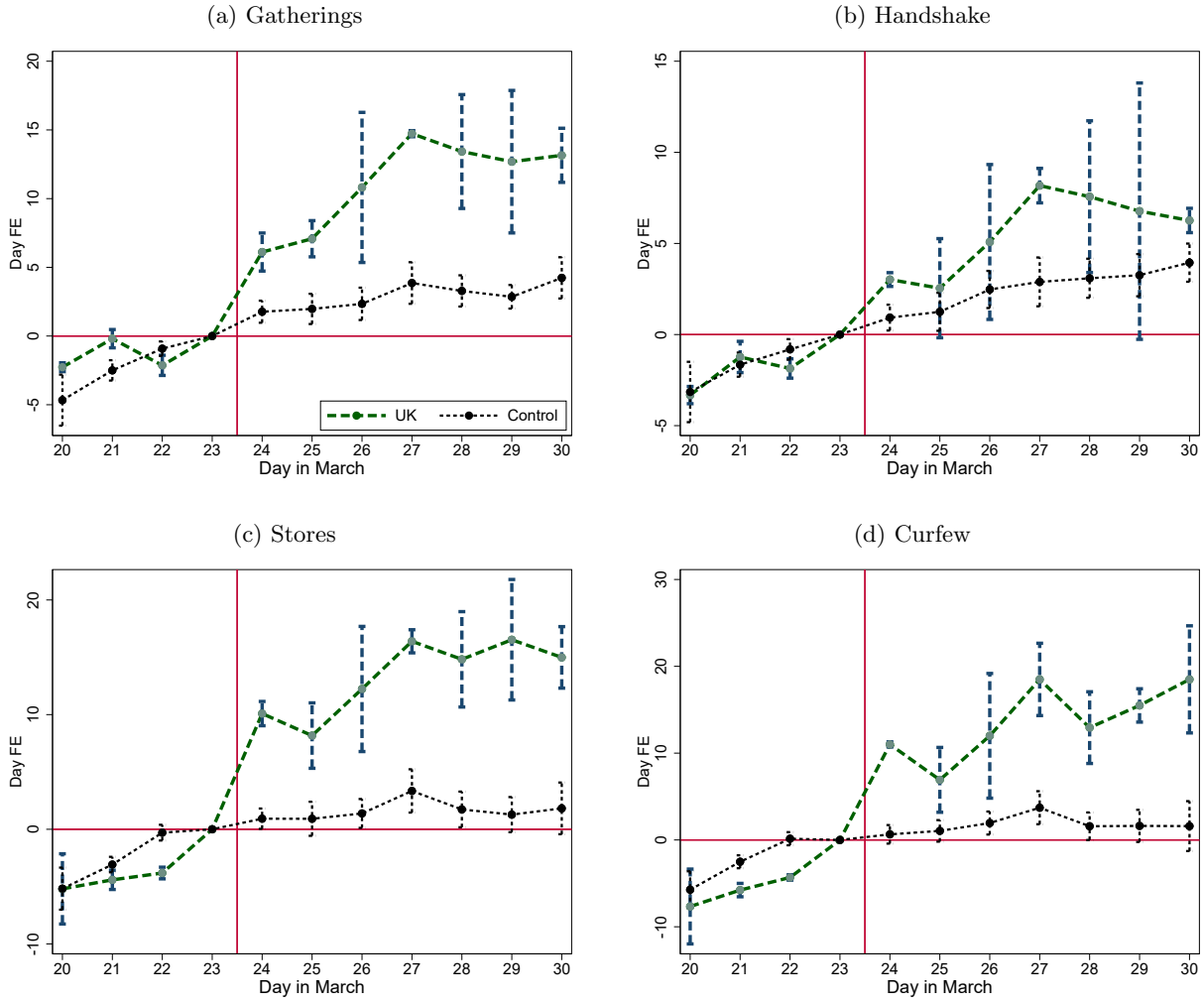
In what follows we will examine whether this large impact of the law on mobility is correlated with changes in the perception of the social norm.[4] To that end, we exploit the lag in the implementation of similar policies in other countries. This policy information comes from the Oxford COVID-19 Government Response Tracker that tracks social distancing policies on the country level by day (Hale et al., 2020). Figure 2 displays the timeline of the implementation of the following policies: school closing, workplace closing, cancellation of public events, stay at home requirements, closure of public transportation, restrictions on internal movements and restrictions on international travel.[5] Figure 2 shows that, even though there was gradual adoption of more stringent policies around the world, there is no discontinuity around March 23rd, the date of the UK lockdown. This will be the basis of our estimation strategy, as described below.

[3]These changes all are statistically significant, as shown in the Online Appendix, Section B.

[4]Our data does not allow us to directly measure the relationship between mobility and norms. In the Online Appendix, Section C, we report tentative results based on questions in the survey about the intention to stay at home.

[5]We focus on the 'containment and closure' category and restrict only to mandatory policies, disregarding simple recommendations from the governments.

Figure 3: Time pattern of perceived social norms in the UK and the control group



Note. The figure reports the day-fixed effects along with their 95% confidence intervals from separate regressions in the UK and in the control group of the perceived social norm measured in the survey about (a) social gatherings, (b) handshaking, (c) stores closure and (d) a total curfew, controlling for country, age, gender, education, and income-fixed effects, as well as household composition. Standard errors are clustered at the country-gender level.

3 Results

3.1 The causal effect of the law on perceived social norms

Figure 3 provides descriptive support for our main result. For each of the four policy measures (forbid social gatherings, no handshake, close stores and introduce a curfew), we report the day-fixed effects for the regressions of the perceived social norm in the UK and in control group countries. We control for differences in observed heterogeneity by including country, age (measured in bins of 5 years), gender, education, and income-fixed effects, as well as a measure of

Table 1: DiD estimates of the effect of the UK lockdown

	Gatherings	**Handshake**	**Stores**	**Curfew**	N	Clusters
			A. Full sample			
Perceived norm	7.370***	3.133**	12.907***	13.950***	94,544	155
	(1.287)	(1.158)	(1.386)	(1.311)		
Misperceptions	-6.182***	-0.278	-6.037***	-3.910*	91,182	137
	(1.518)	(1.499)	(1.649)	(1.630)		
			B. Western and Northern Europe			
Perceived norm	7.825***	4.262***	14.284***	14.405***	37,745	38
	(1.429)	(1.185)	(1.913)	(1.764)		
Misperceptions	-7.622***	-1.699	-6.773*	-4.269*	37,745	38
	(2.020)	(1.153)	(2.979)	(1.958)		

Note. This table presents the difference-in-difference estimates (Post × UK variable) from regressions of perceived social norms (first row in each panel) and misperceptions (second row) on country-age-gender, country-education, income quintile, and day fixed-effects as well as controls for household composition and COVID-19 statistics (lagged and current confirmed cases and deaths). The sample uses all countries and respondents that answered between March 20 and 30. The second line only uses countries for which we have enough responses to compute a misperception variable. Standard errors are clustered at the country-gender level. *Significance levels*: *5%, **1%, ***0.1%.

household composition. For all four social distancing measures the pre-trends are similar prior to the announcement by Boris Johnson. However there is a sharp discontinuity in the trend for the UK after March 23rd.

We statistically test for these effects by running difference-in-difference (DiD) regressions on the perceived social norm for each of the four policies, measured at the individual level, i, on each day d. We generalize the approach as compared to the usual linear model by introducing day and country fixed-effects (which allow for a non-linear effect of the post-treatment and the treatment-group dummy variables) and estimate the following model (bold letters denote column vectors):[6]

$$y_{id} = \alpha + \beta Post_d \times UK_i + \boldsymbol{Country}_i'\boldsymbol{\gamma} + \boldsymbol{Day}_d'\boldsymbol{\phi} + \boldsymbol{x}_{id}'\boldsymbol{\kappa} + u_{id}, \forall i, d \tag{1}$$

The control variables in the $\boldsymbol{x}$ vector notably include (current and lagged) measures of country-date variations in Covid deaths and confirmed cases. We also include country-age-gender, country-education, income quintile, and day fixed-effects as well as a control for the household composition. Last, we account for individual correlation in unobserved heterogeneity both over time

[6]The outcome variable, y_{id}, denotes either one of the four perceived social norms, or one of the four measures of misperceptions as defined in Section 3.1.1.

within countries and between individuals within countries by clustering the standard errors at the country-gender level.[7]

The results of DiD estimates are provided in the first row of Table 1, where we perform the estimation both on the whole set of countries available in the sample (panel A) and on the more homogeneous subset of Western and Northern European countries (panel B; the list is provided in the Online Appendix, Table A). The lockdown announcement has a strong positive effect on the perceived social norm, for all of the different social distancing measures (note that their unit is the same). The effect is strongest for the implementation of a general curfew and the closure of stores. It is weaker for social gatherings and positive, small, and for the most part insignificant for the no handshake policy. The effect is similar in magnitude if we only compare the UK respondents to respondents from other North-Western countries (panel B).

3.1.1 Robustness analysis

Our identification strategy relies on the sudden and unexpected change in law that happened in the UK, to measure the causal effect of this change on the perception of norms. It is thus conditional on the assumption that *(i)* the announcement is the only reason why norms change in the UK; *(ii)* countries in the control group provide a counterfactual and did not experience similar shocks affecting the norms. We consider below several alternative identification strategies, aimed at assessing the robustness of our results to the relaxation of these assumptions. The main results are presented in the Online Appendix, Section E.1.

We address the first concern in two ways. First, as explained in Section 2, our main source of identification is the discontinuity in the government's policies in the UK on March 23. As an alternative to the difference-in-difference estimates on the whole sample period, we narrow the analysis to the neighborhood of the discontinuity and focus solely on data observed on March 22 and March 24. The results confirm that the March 23 announcement is the main source of variations in norms observed in our main specification. It could still be the case, however, that the results are driven by other events that happened in the UK on that same day. To address this concern, we exploit changes in the timing of the introduction of lockdowns in all countries over the time period of interest (lockdowns were introduced in 49 out of the 172 countries represented in our sample), by regressing perceived social norms on country fixed effects, day fixed effects and an indicator variable measuring whether a lockdown is in place. The results on pooled data show that the introduction of a lockdown is correlated with a significant and large increase in perceived social norms. While these results are useful to confirm that the change observed in the UK is unlikely to be due to simultaneity with unrelated events, it is worth stressing that the UK

[7] In the main tables we only report the estimates of the β parameters; the full results tables are provided in the Online Appendix, Section D. Also note that we do not control for normative beliefs in our preferred regressions on perceived social norms, since they are likely to be endogenous to unobserved heterogeneity generating differences perceived social norms. The robustness check available from authors upon request, shows that the results still holds when normative beliefs are controlled for and, if anything, are stronger both statistically and in terms of magnitude.

provides a unique experience of a sudden and unanticipated lockdown, hence achieving a more convincing and more conservative identification of its effect.

The second concern is that our estimates could capture the announcement of similar policies in the countries in the control group. Figure 2 indeed shows that some policy variation does occur in the control group during the sample period — although the trend is very flat around the discontinuity. To wash-out these variations from the estimated effect, we run the difference-in-difference estimation in (1) on the control group made only of countries in which no policy variation happens between March 20 and March 30. This exercise leads to very similar estimates in terms both of magnitude and statistical significance. To further investigate this issue, our last robustness checks relies on variations in the composition of the control group used to generate the estimates provided in Table 1. We replicate the estimation based on the same control group, but from which we remove each country one at a time (the results are provided in the Online Appendix, Section E.2). All estimated coefficients are statistically indistinguishable from the baseline coefficient (first line in the figure). This shows that our results are not driven by the dynamics in one particular country.

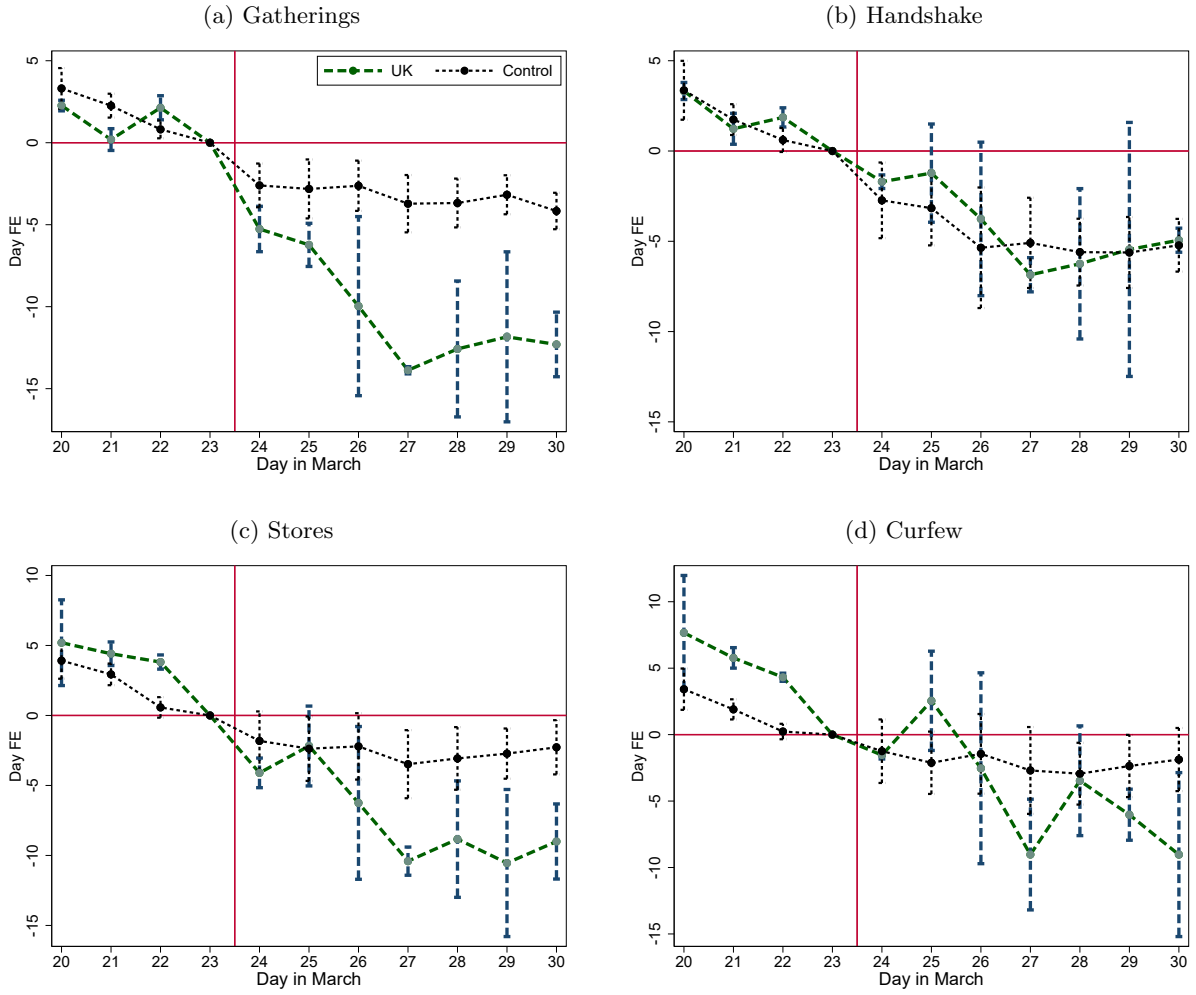
3.2 The gap between perceived and actual norm

The results in the previous section clearly show that the law had a strong effect on individual perceptions of the social norm. We now examine the mechanism that could lie behind this effect. Benabou and Tirole (2011) suggest two main channels: first, the law, by changing material payoffs of the socially desired action, also affects the norm of behavior resulting from equilibrium behavior. In particular, if individuals start adopting the prescribed action because of sanctions imposed by laws, those who still do not take this action will signal their extreme attitudes and carry worse stigma. Here, the law thus directly affects the social norm. A second channel is that the law may bring information on the social norm, even if the norm itself remains unchanged.

These two explanations notably differ regarding whether the social norm actually changes. We build a measure of actual social norms thanks to an additional variable in the survey asking respondents about their *personal norm*, *i.e.* whether they think people should comply with the policy (the variables are described in the Online Appendix, Section A). If the information about the prevalent social norm was perfect, the average over the entire population of the personal norms should be equal to the average perception of the social norm. We thus build a measure of the actual social norm based on the average personal norm. To account for the fact that the sample is not representative of the entire population, we compute the weighted average of this variable at the country level separately before and after March 23, where the weights rescale the data to make our sample representative of the gender-age-income-household size composition of the population at the country level.

Using this measure, we first show that there was an initial gap between the actual social norm and the average perception of the social norm in the UK, a gap we call misperceptions. Section F

Figure 4: Time pattern of misperceptions in the UK and the control group



Note. The figure reports the day-fixed effects along with their 95% confidence intervals from separate regressions in the UK and in the control group of the misperception about (a) social gatherings, (b) handshaking, (c) stores closure and (d) a total curfew, controlling for country, age, gender, education, and income-fixed effects, as well as household composition. Standard errors are clustered at the country-gender level.

in the Online Appendix presents misperceptions before March 23 in the left panel and after in the right panel. The left panel clearly shows that before the lockdown, misperceptions were very high, in other words, the perceptions of the social norm were significantly below the norm itself for most dimensions, except for handshake where the discrepancy was much lower. The right panel shows that after March 23, this misperception sharply drops. This evolution observed in the raw data is confirmed in Figure 4 where we replicate Figure 3 but on the misperception measure. As shown in Table 1 (second row in each subpanel), these results all are statistically significant based on DiD estimates from linear models similar to (1) in which the misperception is used as a dependent variable. This effect on misperceptions, that echoes the effect on the perceived social

norms, is essentially driven by the fact that personal norms themselves do not change (see the Online Appendix, Section G). We also ascertain that the effect is not driven by the use of weights thanks to a replication on weighted data of the DiD estimation of the effect on perceived social norms (see the Online Appendix, Section H). This set of results suggests that the most plausible channel is that the law changed the perceptions of the social norm without actually changing the norm itself. In fact, for handshakes, the dimension where misperceptions was initially the lowest, the law had virtually no effect on the perceptions of the social norm.[8]

4 Remarks and Conclusions

In this paper, we use the announcement of a sudden lockdown in the UK to provide causal evidence that laws affect the perception of social norms in the population. We also show that the most plausible mechanism is an informational channel rather than a direct change in the social norms. The UK context had several features that favoured this informational channel. First, the population was initially pessimistic about the prevalent norm, as indicated by the large misperception gap before March 23rd, leaving room for new information to affect beliefs. Second, as described in Section 2, the enforcement of the law was weaker than in other countries, decreasing the potential for a direct impact on social norms themselves. In this context, our results show that the law provides information, resulting in a large change in the perceptions of social norms. Our study thus sheds new light on the mechanisms explaining why and under what circumstances laws are effective, and contributes to a better understanding of how perceptions about prevailing social norms are formed.

As a conclusion, it is worth discussing to what extent the particular context we study differs compared to other environments where laws may affect social norms and their perception. An important difference relates to the timing of the implementation of the new legal rule and to the procedure of its adoption. Laws are usually debated in parliaments and subject to public discussion (this is for instance the case of the introduction of same-sex marriage), while the UK lockdown was a sudden decision of the government. This specific setting has clear advantages in terms of identification since it relies on a sudden change. Moreover, even though the policy is not publicly debated, it still provides information about the underlying norm. Indeed, in a democracy, accountability constrains politicians to take into account voters' preferences. Thus British citizens, who are aware of this accountability mechanism, receive a clear message regarding the perception the government has of the general support in the population for this measure.

[8]This interpretation is further substantiated by the analysis of the heterogeneity of the response of perceived social norms to the UK lockdown. When interacting the treatment effect with subjective perception variables in separate models, the only dimension of heterogeneity that seems to matter is how well individuals are informed about COVID itself, measured as the gap between their estimate of the number of COVID cases and the actual number in their country. The higher that gap, the more the perception of the social norm relative to the curfew variable shifts up. These results are provided in the Online Appendix, Section I, along with the results from interactions with individual covariates. Non of these interactions with socio-economic variables are significant, except for gender.

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Online Appendix

A Sample information

A.1 Variables and data source

The entire set of variables available in the data is described in FWH. We only describe below the variables used as the main outcomes in the analysis. Table A reports the distribution of answers across countries, and Table B provides a comparison of the descriptive statistics observed in the UK and in other countries.

Perceived social norms. Our measure of perceived social norms come from questions about the perception of others' beliefs about Coronavirus measures:

- *sob_social*: How many of 100 people in your country do you think believe that participation at social gatherings should be cancelled because of the coronavirus right now? [slider ranging from 0 to 100 — initiated at 0]
- *sob_handshake*: How many of 100 people in your country do you think believe that one should not shake other people's hands because of the coronavirus right now? [slider ranging from 0 to 100 — initiated at 0]
- *sob_stores*: How many of 100 people in your country do you think believe that all shops in your country other than particularly important ones, such as supermarkets, pharmacies, post offices, and gas stations, should be closed because of the coronavirus right now? [slider ranging from 0 to 100 — initiated at 0]
- *sob_curfew*: How many of 100 people in your country do you think believe there should be a general curfew in your country (with the exception of grocery shopping, necessary family trips, and the commute to work) because of the coronavirus right now? [slider ranging from 0 to 100 — initiated at 0]

Misperception. To build a measure of misperception, we rely on questions about personal norms:

- *fob_social*: "What do you think: should people in your country cancel their participation at social gatherings because of the coronavirus right now?" [No = 0; Yes = 1]
- *fob_handshake*: "What do you think: should people in your country not shake other people's hands because of the coronavirus right now?" [No = 0; Yes = 1]
- *fob_stores*: "What do you think: should all shops in your country other than particularly important ones, such as supermarkets, pharmacies, post offices, and gas stations, be closed because of the coronavirus right now?" [No = 0; Yes = 1]
- *fob_curfew:* "What do you think: should there be a general curfew in your country (with the exception of grocery shopping, necessary family trips, and the commute to work) because of the coronavirus right now?" [No = 0; Yes = 1]

For each policy, we compute the weighted average of this variable at the country level, separately before and after March 23. The weights aim at restoring the national representativity of the sample regarding observed heterogeneity available in the data. However, for some countries the dataset did not include the necessary information to construct weights. Thus, the total sample shrinks from 94,544 to 91,182 for models that study misperception as an outcome. Note that the European sample is not affected by this.

Weights. The dataset also contains census information about the distribution of the population in each country over age, gender, education, income and household composition (assuming independence in the population between these characteristics). We use this additional source of information to build weights rescaling the observations available in the sample to make them representative of the country population.

Table A: Distribution of responses across countries

	iso-code	N	%
Brazil	BR	11,230	11.27
United Kingdom	GB	11,151	11.19
United States	US	11,060	11.10
Germany	**DE**	82,77	8.31
Sweden	**SE**	57,46	5.77
Switzerland	**CH**	4,152	4.17
Russia	RU	3,364	3.38
Mexico	MX	3,240	3.25
Turkey	TR	2,784	2.79
Canada	CA	2,709	2.72
France	**FR**	2,632	2.64
Belarus	BY	2,621	2.63
Spain	ES	2,211	2.22
Italy	IT	1,794	1.80
Colombia	CO	1,633	1.64
Indonesia	ID	1,541	1.55
Ukraine	UA	1,440	1.45
Netherlands	**NL**	1,346	1.35
Austria	**AT**	1,042	1.05
Peru	PE	1,015	1.02
India	IN	935	0.94
Qatar	QA	860	0.86
Argentina	AR	858	0.86
Australia	AU	852	0.86
Romania	RO	791	0.79
Finland	**FI**	756	0.76
Philippines	PH	731	0.73
Ireland	**IE**	695	0.70
Venezuela	VE	655	0.66
Vietnam	VN	634	0.64
Slovakia	SK	609	0.61
Latvia	**LV**	601	0.60
Belgium	**BE**	551	0.55
Dominican Republic	DO	546	0.55
Portugal	PT	542	0.54
Chile	CL	522	0.52
Malaysia	MY	512	0.51
Denmark	**DK**	504	0.51
Albania	AL	468	0.47
South Africa	ZA	468	0.47
Israel	IL	403	0.40
Singapore	SG	395	0.40
Poland	PL	377	0.38
Morocco	MA	351	0.35
Kenya	KE	340	0.34
China	CN	333	0.33
New Zealand	NZ	330	0.33
Bulgaria	BG	313	0.31
Greece	GR	310	0.31
Thailand	TH	303	0.30
Ecuador	EC	299	0.30
Norway	**NO**	292	0.29
South Korea	KR	275	0.28
Japan	JP	274	0.28
Czechia	CZ	256	0.26
Uruguay	UY	240	0.24
Hungary	HU	232	0.23
Nigeria	NG	212	0.21
Total		99,613	100.00

Note. Countries in bold letters are part of the Northern and Western European countries sub-sample.

Table B: Respondents' covariates

	Control	UK	Overall
Women	56.6%	50.4%	55.9%
Years of Education	16.20	17.26	16.33
	(4.815)	(3.713)	(4.711)
Age	38.22	43.54	38.85
	(12.84)	(12.89)	(12.96)
Single	45.1%	33.0%	43.7%
Number of Household Members	2.863	2.664	2.839%
	(1.591)	(1.356)	(1.566)
First income quintile	8.60%	10.68%	10.43%
Second income quintile	6.51%	6.66%	6.64%
Third income quintile	4.90%	7.18%	6.91%
Fourth income quintile	12.13%	12.56%	12.51%
Fourth income quintile	67.86%	62.92%	63.50%
Confirmed COV-19 cases p.c.	0.206	0.0978	0.193%
	(0.290)	(0.0409)	(0.275)
Lag confirmed COV-19 cases p.c.	0.0259	0.0141	0.0245%
	(0.0339)	(0.00676)	(0.0322)
Confirmed COV-19 deaths p.c.	0.00591	0.00553	0.00587%
	(0.0169)	(0.00410)	(0.0159)
Lag Confirmed COV-19 cases p.c.	0.00106	0.000985	0.00105%
	(0.00244)	(0.000863)	(0.00231)

A.2 Verbatim of Boris Johnson's March 23 announcement

According to UK government official communication, the speech reads as follows (`https://www.gov.uk/government/speeches/pm-address-to-the-nation-on-coronavirus-23-march-2020`, text emphasized by us):

Good Evening,

The coronavirus is the biggest threat this country has faced for decades – and this country is not alone.

All over the world we are seeing the devastating impact of this invisible killer.

And so tonight I want to update you on the latest steps we are taking to fight the disease and what you can do to help.

And I want to begin by reminding you why the UK has been taking the approach that we have.

Without a huge national effort to halt the growth of this virus, there will come a moment when no health service in the world could possibly cope; because there won't be enough ventilators, enough intensive care beds, enough doctors and nurses.

And as we have seen elsewhere, in other countries that also have fantastic health care systems, that is the moment of real danger.

To put it simply, if too many people become seriously unwell at one time, the NHS will be unable to handle it - meaning more people are likely to die, not just from Coronavirus but from other illnesses as well.

So it's vital to slow the spread of the disease.

Because that is the way we reduce the number of people needing hospital treatment at any one time, so we can protect the NHS's ability to cope - and save more lives.

And that's why we have been asking people to stay at home during this pandemic.

And though huge numbers are complying - and I thank you all - the time has now come for us all to do more.

From this evening I must give the British people a very simple instruction - you must stay at home.

Because the critical thing we must do is stop the disease spreading between households.

That is why people will only be allowed to leave their home for the following very limited purposes:

- ***shopping for basic necessities, as infrequently as possible***
- ***one form of exercise a day - for example a run, walk, or cycle - alone or with members of your household;***
- ***any medical need, to provide care or to help a vulnerable person; and travelling to and from work, but only where this is absolutely necessary and cannot be done from home.***

That's all - these are the only reasons you should leave your home.

You should not be meeting friends. If your friends ask you to meet, you should say No.

You should not be meeting family members who do not live in your home.

You should not be going shopping except for essentials like food and medicine - and you should do this as little as you can. And use food delivery services where you can.

If you don't follow the rules the police will have the powers to enforce them, including through fines and dispersing gatherings.

To ensure compliance with the Government's instruction to stay at home, we will immediately:

- ***close all shops selling non-essential goods, including clothing and electronic stores and other premises including libraries, playgrounds and outdoor gyms, and places of worship;***
- ***we will stop all gatherings of more than two people in public – excluding people you live with;***

- ***and we'll stop all social events, including weddings, baptisms and other ceremonies, but excluding funerals.***

Parks will remain open for exercise but gatherings will be dispersed.

No Prime Minister wants to enact measures like this.

I know the damage that this disruption is doing and will do to people's lives, to their businesses and to their jobs.

And that's why we have produced a huge and unprecedented programme of support both for workers and for business.

And I can assure you that we will keep these restrictions under constant review. We will look again in three weeks, and relax them if the evidence shows we are able to.

But at present there are just no easy options. The way ahead is hard, and it is still true that many lives will sadly be lost.

And yet it is also true that there is a clear way through.

Day by day we are strengthening our amazing NHS with 7500 former clinicians now coming back to the service.

With the time you buy - by simply staying at home - we are increasing our stocks of equipment.

We are accelerating our search for treatments.

We are pioneering work on a vaccine.

And we are buying millions of testing kits that will enable us to turn the tide on this invisible killer.

I want to thank everyone who is working flat out to beat the virus.

Everyone from the supermarket staff to the transport workers to the carers to the nurses and doctors on the frontline.

But in this fight we can be in no doubt that each and every one of us is directly enlisted.

Each and every one of us is now obliged to join together.

To halt the spread of this disease.

To protect our NHS and to save many many thousands of lives.

And I know that as they have in the past so many times.

The people of this country will rise to that challenge.

And we will come through it stronger than ever.

We will beat the coronavirus and we will beat it together.

And therefore I urge you at this moment of national emergency to stay at home, protect our NHS and save lives.

Thank you.

B Effect of March 23 lockdown measures on movements in the UK

The Table below reports the results of the Difference-in-Difference estimation (*Post* × *UK* variable) of the March 23 lockdown decision in the UK on mobility data collected from Google's community mobility reports. Each outcome variable is the change in spending time at a given place relative to the median value of the same weekday in the January 3-February 6 period. The specification controls for COVID-19 statistics (lagged and current confirmed cases and deaths) as well as a non-linear effect of the group and Post variable through day- and country fixed-effects.

	Retail /recreation	**Pharmacy /Grocery**	**Parks**	**Transit**
A. Full sample ($N = 960$; 124 Clusters)				
Post × UK	-25.642***	-21.746***	-29.655***	-16.521***
	(1.024)	(1.167)	(2.007)	(0.987)
Lag confirmed COV-19 cases p.c.	14.350	49.672	3.192	16.562*
	(10.109)	(31.207)	(25.382)	(8.224)
Lag confirmed COV-19 deaths p.c.	114.559	-39.607	-1378.007	-85.451
	(221.077)	(331.812)	(827.303)	(175.091)
Confirmed COV-19 cases p.c.	9.915*	8.681*	5.391	9.175*
	(3.825)	(3.393)	(3.855)	(4.151)
Confirmed COV-19 deaths p.c.	32.310	-24.885	61.112	36.770
	(49.066)	(46.384)	(58.136)	(45.195)
B. Western and Northern Europe ($N = 167$; 16 Clusters)				
Post × UK	-30.497***	-26.002***	-29.849***	-20.610***
	(1.379)	(1.470)	(3.774)	(1.064)
Lag confirmed COV-19 cases p.c.	4.168	24.933	-49.647	2.981
	(6.110)	(34.540)	(28.724)	(5.409)
Lag confirmed COV-19 deaths p.c.	-703.338	-594.192	-3024.148	-627.219
	(521.176)	(457.703)	(1572.284)	(332.433)
Confirmed COV-19 cases p.c.	2.174	2.860	7.658*	1.882
	(1.618)	(2.114)	(3.262)	(1.693)
Confirmed COV-19 deaths p.c.	176.052	-60.292	234.398	75.669
	(115.063)	(98.899)	(324.278)	(91.025)

Note. Standard errors are clustered at the country level. *Significance levels*: *5%, **1%, ***0.1%.

C Correlation between self-reported mobility and norms

The survey contains information on whether respondents intend to leave their home in the course of the next five days and for what motives. Table C reports the results from an OLS regression of these mobility variables on the personal norm about a curfew and the perceived social norm to support a curfew. We build the variables used as dependent variables in Table C from two series of the survey questions: the first asks "*Do you need to leave your home in the next 5 days?*" [yes = 1; no =0]. The second is phrased "*What are the reasons for you to leave your home (check all that apply)?*"; among all possible answers, we focus on: [Friends] ("*Meeting friends or relatives*"); [Tired] ("*Getting tired of being inside of the house*"); [Bored] ("*Getting bored*"); [Work] ("*Going to work*"); [Freedom] ("*Exercising my freedom*"). The results support the existence a relation between mobility behavior and both the personal norms and the perception of social norms: respondents who believe that others support a curfew are less likely to state that they plan to leave their home in the coming days.

Table C: Relation between self-reported behavior and both personal and perceived social norms

	Leaves Home	**Friends**	**Bored**	**Tired**	**Work**	**Freedom**
Perceived social norms (Curfew)	-0.058	-0.056***	-0.023***	-0.048***	-0.048***	-0.008
	(0.037)	(0.014)	(0.005)	(0.011)	(0.011)	(0.006)
Personal norms (Curfew)	-0.167***	-0.059***	-0.054***	-0.101***	-0.101***	-0.034***
	(0.015)	(0.007)	(0.006)	(0.005)	(0.005)	(0.005)
Constant	0.743***	0.118***	0.089***	0.184***	0.184***	0.048***
	(0.032)	(0.015)	(0.008)	(0.011)	(0.011)	(0.008)

Note. Standard errors are clustered on the country-gender level ($N = 99,613$; 170 clusters). The perceived social norm explanatory variable is the original variable from the survey but divided by 100 to make it comparable with the social norm. *Significance levels*: *5%, **1%, ***0.1%.

D Full results from Table 1

Table D: DiD estimates of the effect of the UK lockdown on perceived social norms

	Gatherings	**Handshake**	**Stores**	**Curfew**
A. Full sample ($N = 94,544$; 155 clusters)				
Post x UK	7.370***	3.133**	12.907***	13.950***
	(1.287)	(1.158)	(1.386)	(1.311)
Lagged confirmed COV-19 cases p.c.	-0.090	-7.487	-4.801	-9.290
	(13.873)	(10.020)	(14.224)	(14.560)
Lagged confirmed COV-19 deaths p.c.	-253.572	-24.141	216.299	298.979
	(261.672)	(262.240)	(275.434)	(361.588)
Confirmed COV-19 cases p.c.	-7.885***	-7.108***	-6.045	-8.313
	(1.676)	(1.233)	(3.455)	(4.608)
Confirmed COV-19 deaths p.c.	59.200***	24.718	-30.181	-31.590
	(15.496)	(20.375)	(25.644)	(28.736)
Household size	0.189***	0.109	0.292***	0.481***
	(0.055)	(0.063)	(0.059)	(0.064)
Constant	68.304***	76.253***	58.690***	48.829***
	(0.346)	(0.316)	(0.654)	(0.855)
B. Western and Northern Europe ($N = 37,745$; 38 clusters)				
Post x UK	7.825***	4.262***	14.284***	14.405***
	(1.429)	(1.185)	(1.913)	(1.764)
Lagged confirmed COV-19 cases p.c.	-1.267	-4.035	-17.841	-34.271*
	(18.043)	(11.962)	(16.923)	(16.785)
Lagged confirmed COV-19 deaths p.c.	-362.520	-281.885	455.944	1179.429
	(490.437)	(446.046)	(421.836)	(587.650)
Confirmed COV-19 cases p.c.	-6.500***	-3.496*	-0.432	-7.228
	(1.608)	(1.454)	(5.654)	(5.974)
Confirmed COV-19 deaths p.c.	117.739	42.186	18.662	-99.899
	(62.331)	(53.258)	(68.630)	(108.627)
Household size	0.145**	0.209***	0.189**	0.468***
	(0.046)	(0.051)	(0.056)	(0.084)
Constant	72.534***	83.664***	61.210***	51.851***
	(0.859)	(0.599)	(2.076)	(2.243)

Note. Standard errors are clustered at the country-gender level. *Significance levels*: *5%, **1%, ***0.1%.

Table E: DiD estimates of the effect of the UK lockdown on misperceptions

	Gatherings	**Handshake**	**Stores**	**Curfew**
A. Full sample ($N = 91,182$; 137 clusters)				
Post x UK	-6.182***	-0.278	-6.037***	-3.910*
	(1.518)	(1.499)	(1.649)	(1.630)
Lagged confirmed COV-19 cases p.c.	7.022	13.025	16.393	51.882*
	(14.491)	(10.938)	(14.992)	(22.504)
Lagged confirmed COV-19 deaths p.c.	344.059	115.689	115.465	-595.692
	(333.648)	(248.481)	(355.525)	(303.982)
Confirmed COV-19 cases p.c.	7.849***	7.387	-0.077	-1.014
	(1.923)	(4.296)	(4.429)	(6.441)
Confirmed COV-19 deaths p.c.	-87.380***	28.834	-75.645	20.271
	(18.264)	(26.188)	(49.525)	(45.952)
Household size	-0.175**	-0.127	-0.252***	-0.453***
	(0.057)	(0.064)	(0.060)	(0.069)
B. Western and Northern Europe ($N = 37,745$; 38 clusters)				
Post x UK	-7.622***	-1.699	-6.773*	-4.269*
	(2.020)	(1.153)	(2.979)	(1.958)
Lagged confirmed COV-19 cases p.c.	2.137	-6.573	-7.529	45.302
	(17.054)	(14.996)	(20.810)	(36.197)
Lagged confirmed COV-19 deaths p.c.	325.700	280.957	-709.197	512.372
	(578.627)	(450.184)	(639.362)	(491.423)
Confirmed COV-19 cases p.c.	-0.615	2.965	-10.248	-8.838
	(3.537)	(2.085)	(8.472)	(6.000)
Confirmed COV-19 deaths p.c.	-212.282*	76.330	-84.867	-242.935*
	(80.470)	(56.498)	(160.257)	(109.129)
Household size	-0.145**	-0.211***	-0.186**	-0.457***
	(0.046)	(0.051)	(0.056)	(0.083)

Note. Standard errors are clustered at the country-gender level. *Significance levels*: *5%, **1%, ***0.1%.

E Results from the robustness analysis

E.1 Regression results

The Table below reports the Difference-in-Difference estimates from the robustness analysis described in Section 3.1.1. The full results are available from the authors upon request.

Table F: Robustness Checks

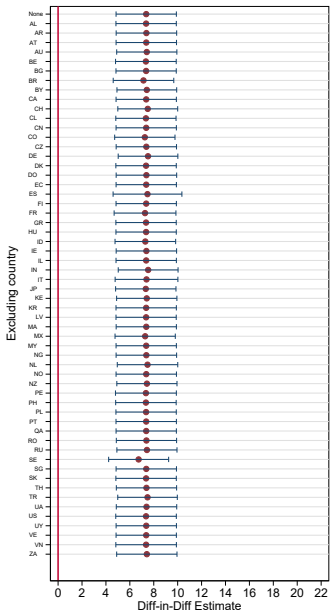
	Gatherings	**Handshake**	**Stores**	**Curfew**	N	Clusters
A. March 22 vs March 24						
Full Sample	5.420***	2.819***	11.967***	12.446***	47,366	142
	(0.821)	(0.709)	(1.420)	(1.501)		
Western and Northern Europe	4.798***	2.809***	11.293***	11.600***	20,029	37
	(0.824)	(0.577)	(1.682)	(1.453)		
B. Effect of a strict lockdown on pooled data						
Full Sample	2.721***	0.852	5.558***	7.193***	94,544	155
	(0.647)	(0.591)	(0.968)	(1.006)		
Western and Northern Europe	3.303***	2.058***	7.394***	8.146***	37,745	38
	(0.401)	(0.420)	(0.801)	(0.815)		
C. Countries with no change in their lockdown policy						
Full Sample	8.043***	3.392**	14.051***	14.886***	66,337	103
	(1.188)	(1.113)	(1.299)	(1.279)		
Western and Northern Europe	8.367***	4.454***	14.899***	14.864***	28,172	29
	(1.168)	(0.938)	(1.422)	(1.206)		

Note. Standard errors are clustered at the country-gender level. *Significance levels*: *5%, **1%, ***0.1%.

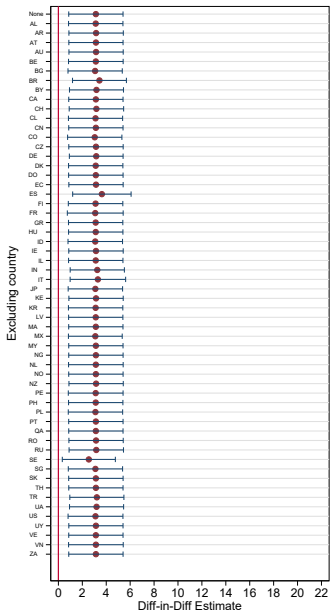
E.2 Step deletion of countries from the control group

The figure below reports the point estimates along with 95% confidence intervals resulting from the difference-in-difference estimation in (1) performed on control groups resulting from the step deletion of each country one after the other. The countries iso-code are defined in Table A.

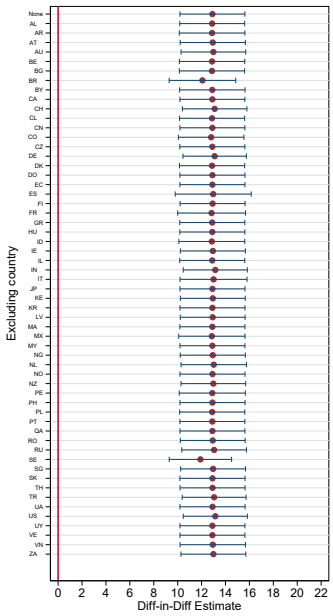
(a) Gatherings



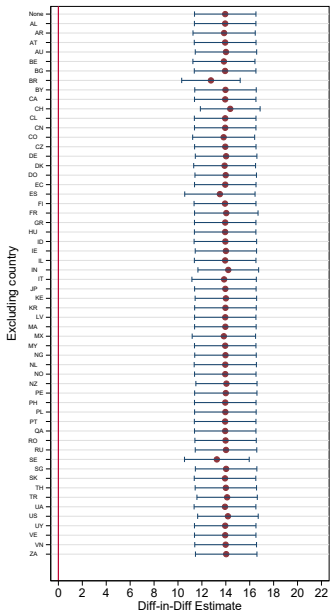
(b) Handshake



(c) Closure



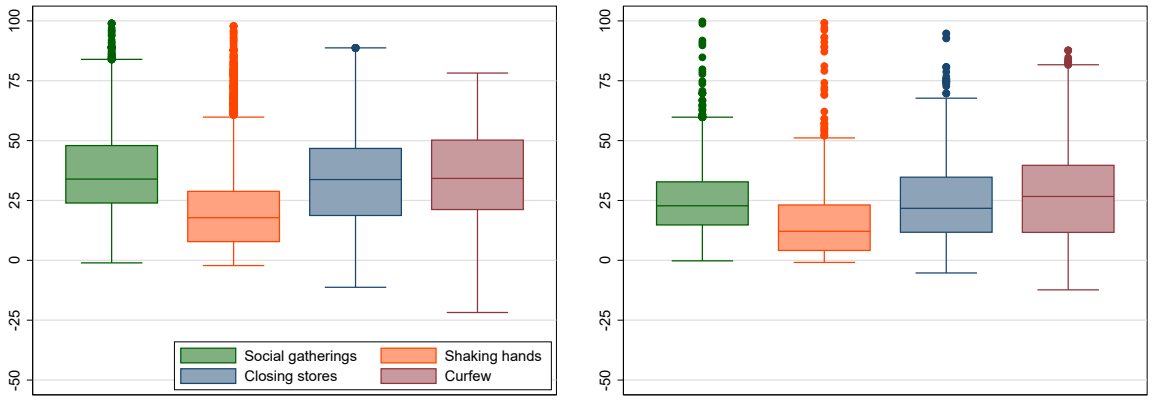
(d) Curfew



F Before-After comparison of misperceptions in the UK

The figure below displays the discrepancy between the norm and the individual perception of the norm in the UK before and after March 23. The horizontal line in the middle of the box characterizes the median. The upper (lower) ends of the box characterizes the 75th (25th) percentile. The upper (lower) ends of the vertical lines are the upper (lower) adjacent values. Points above (below) are outliers.

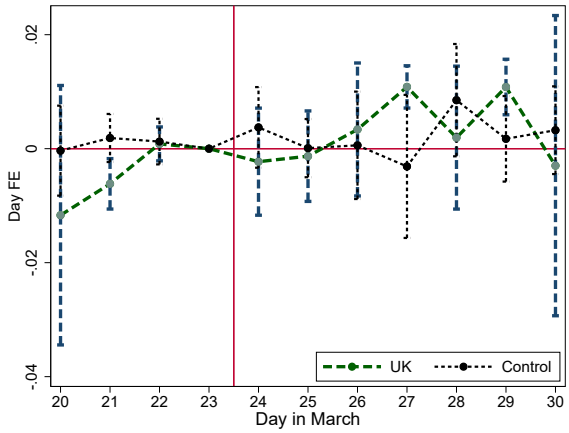
(a) **Before** (b) **After**



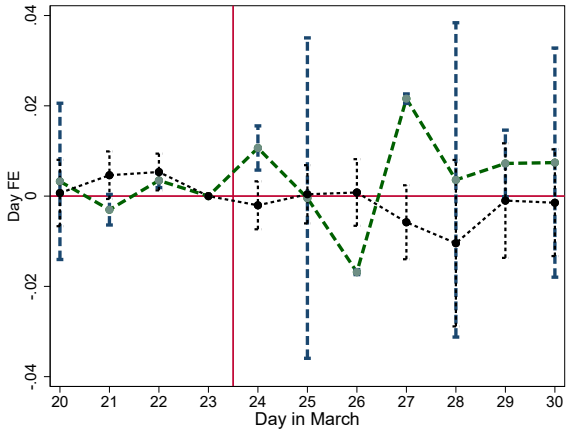
G Time-pattern of personal norms in the UK and the control group

For each of the four policy measures, the figure below reports the day-fixed effects from individual personal norms in the UK and in control group countries, controlling for country-, age-, gender-, education-, and income-fixed effects, as as well as a measure of household composition. The results from difference-in-difference estimates of the effect of March 23 announcement on individual personal norms, available from the authors upon request, confirm that the announcement has a non-significant effect regarding both handshaking and social gatherings, and a small but statistically significant effect regarding stores closure and a total curfew.

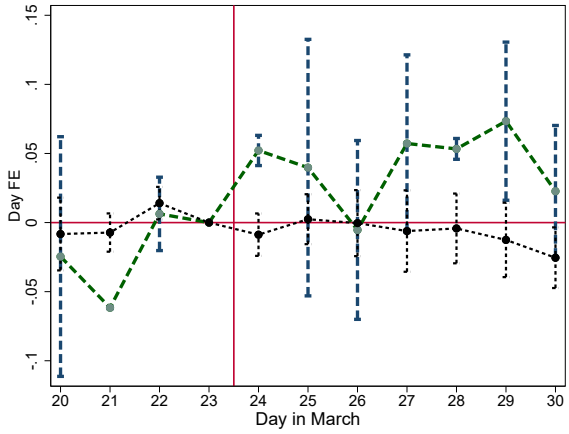
(a) Social gatherings



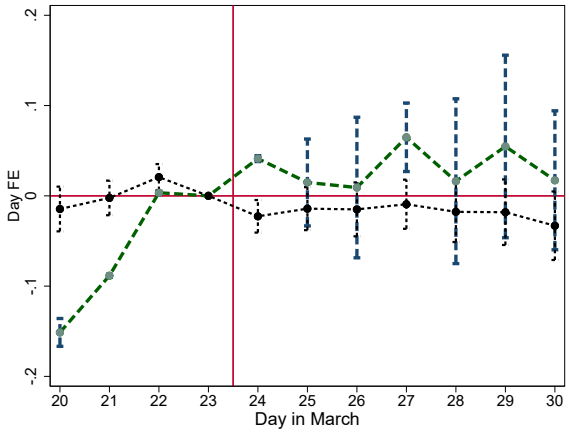
(b) Handshake



(c) Stores closure



(d) Total curfew



H Replication of the results on weighted data

The table below provides the DiD estimate in (1) using weights. The weights provide representativity on the country level by age, income quintile, and education.

Table G: DiD estimates of the effect of the UK lockdown using weighted data

	Gatherings	**Handshake**	**Stores**	**Curfew**	N	Clusters
			D. Weighted data			
Perceived norm	7.079***	3.397*	13.313***	16.698***	90,396	94
	(1.473)	(1.343)	(2.066)	(1.679)		
Western and Northern Europe	7.447***	3.040	15.487***	18.092***	37,357	26
	(1.756)	(1.837)	(2.548)	(2.224)		

Note. Standard errors are clustered at the country-gender level. *Significance levels*: *5%, **1%, ***0.1%.

I Heterogeneity in the UK response to the lockdown

The tables below provide the results from separate regressions in which we allow the DiD estimate in (1) to interact with observed individual covariates (Table H) and subjective variables (Table I). For each set of regressions, we report the coefficient of the corresponding variable, the resulting DiD estimate ($Post \times UK$ variable) as well as the interaction. The subjective variables come from the "Perceptions of government/public response and efficacy" part of the survey, and are measured as:

- *perceivedeffectivnes*: What do you think: How effective are social distancing measures (e.g., through a general curfew) to slow down the spread of the coronavirus? [5- point scale; 1 = Not at all effective; 2 = Not effective; 3 = Neither effective nor ineffective; 4 = Effective; 5 = Very effective]
- *govtrust*: How much do you trust your country's government to take care of its citizens? [5-point scale; 1 = Strongly distrust; 2 = Somewhat distrust; 3 = Neither trust nor distrust; 4 = Somewhat trust; 5 = Strongly trust]
- *govfact*: How factually truthful do you think your country's government has been about the coronavirus outbreak? [5-point scale; 1 = Very untruthful; 2 = Somewhat untruthful; 3 = Neither truthful nor untruthful; 4 = Somewhat truthful; 5 = Very truthful]

For each variable, we generate dummy variables equal to 1 if the individual's response is above the midpoint of the Likert scale, and 0 if it is below.

Table H: Heterogeneity of the DiD estimate according to individual covariates

	Gatherings	**Handshake**	**Stores**	**Curfew**
A: Gender (the direct effect is part of the model FE)				
Post x UK	13.228***	7.957***	17.567***	18.120***
	(0.816)	(0.547)	(1.000)	(1.047)
Post x UK x Female	-3.599***	-2.964***	-2.863***	-2.562***
	(0.351)	(0.102)	(0.217)	(0.126)
B. Income bracket (the direct effect is part of the model FE)				
Post x UK	6.142***	3.193***	10.268***	13.022***
	(0.656)	(0.674)	(1.537)	(1.856)
Post x UK x Income quintile	0.295	-0.015	0.633	0.223
	(0.369)	(0.315)	(0.561)	(0.633)
C. Years of education				
Post x UK	9.449***	5.049***	15.936***	12.795***
	(1.362)	(1.160)	(1.027)	(1.978)
Years of education	-0.023	0.004	-0.125***	-0.298***
	(0.018)	(0.014)	(0.026)	(0.034)
Post x UK x Years of education	-0.127***	-0.115***	-0.179**	0.050
	(0.033)	(0.021)	(0.055)	(0.049)
D. Household size				
Post x UK	6.503***	2.870**	12.578***	12.383***
	(0.833)	(1.055)	(1.332)	(1.471)
Household size	0.184**	0.108	0.290***	0.472***
	(0.056)	(0.064)	(0.060)	(0.064)
Post x UK x Household size	0.329	0.100	0.125*	0.595***
	(0.221)	(0.084)	(0.063)	(0.121)

Note. Standard errors are clustered on the country-gender level ($N = 94,544$; 155 clusters). *Significance levels*: *5%, **1%, ***0.1%.

Table I: Heterogeneity of the DiD estimate according to subjective perception variables

	Gatherings	**Handshake**	**Stores**	**Curfew**
A. Misestimation of Covid cases				
Post x UK	7.260***	3.059*	12.649***	13.544***
	(1.194)	(1.177)	(1.376)	(1.303)
Mistake	-0.002**	-0.003***	-0.003**	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Post x UK x Mistake	0.011	0.008*	0.025***	0.038***
	(0.010)	(0.003)	(0.004)	(0.004)
B. Subjective effectiveness of containment measures				
Post x UK	8.441***	4.780*	17.471***	14.315***
	(1.250)	(2.067)	(1.403)	(2.332)
Subjective Effectiveness	0.581***	0.516***	0.944***	1.153***
	(0.147)	(0.151)	(0.181)	(0.226)
Post x UK x Subjective Effectiveness	-0.272	-0.409	-1.124***	-0.114
	(0.507)	(0.727)	(0.283)	(0.287)
C. Subjective trust in government				
Post x UK	6.260***	3.855**	10.357***	12.423***
	(0.719)	(1.210)	(1.048)	(1.028)
Trust in Government	2.696***	2.454***	2.387***	2.064***
	(0.098)	(0.124)	(0.166)	(0.220)
Post x UK x Trust in Government	0.028	-0.538	0.535	0.242
	(0.497)	(0.648)	(0.570)	(0.450)
D. Government was truthful				
Post x UK	7.705***	5.230***	11.710***	11.366***
	(0.702)	(1.321)	(0.861)	(1.212)
Government was truthful	2.450***	2.267***	2.053***	1.595***
	(0.104)	(0.122)	(0.158)	(0.206)
Post x UK x Government was truthful	-0.290	-0.796	0.192	0.637**
	(0.432)	(0.650)	(0.334)	(0.226)

Note. Standard errors are clustered on the country-gender level ($N = 94,544$; 155 clusters). *Significance levels*: *5%, **1%, ***0.1%.