

The Show Must Go On: How to Elicit Lablike Data on the Effects of COVID-19 Lockdown on Fairness and Cooperation

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Abstract

Given the impossibility of having participants in the lab during the COVID-19 lockdown, we introduce a novel online methodology based on a multi-platform architecture that brings experimental subjects in a “Lab on the Web”. This methodology allows us to study the effects of Covid-19 lockdown in Italy on preferences for fairness and cooperation. Results from sessions of standard Ultimatum and linear Public Good games validate our methodology. Moreover, we show that the circumstances in which participants lived the lockdown significantly affect their behavior in the two games. In particular, participants are more selfish in the ultimatum bargaining and contribute more to the public good when social isolation is stronger. However, cooperation decreases when lockdown is longer. We interpret these results as evidence of “social embeddedness” to compensate for “social distancing”.

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Keywords: Covid-19, economic experiment, fairness, voluntary contribution mechanism, cooperation, lablike data.

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1 Introduction

Covid-19 has heavily affected the way we live and react to different social interactions. Especially during lockdown, we experienced instances ranging from much reduced physical interaction to complete isolation. As new forms of social interaction will be maintained also in the foreseeable future, it is relevant to investigate whether and how social distancing affects individual behavior.

The need to continue experimental data mining and the impossibility of bringing students to the laboratory led us to devise a novel online architecture to “bring the laboratory to the web”. Our locked down participants play standard Ultimatum and linear Public Good game using a system of linked web platforms which preserves the salient features of lab experiments while avoiding physical proximity. We validate this methodology by comparing our results to well known experimental evidence. To the best of our knowledge, no other research on Covid-19 is based on lablike experimental data collected during the lockdown. Furthermore, these data permit to analyze: (i) how lockdown influences individual preferences for fairness and cooperation, and (ii) whether the perceived danger of the pandemic strengthens other-regarding concerns or exacerbates self-protection.

The paper develops as follows: section 2 presents the experimental design and section 3 the novel methodology; sections 4 and 5 report our main results and section 6 concludes.

2 Experimental Design

The experiment was run between April 21 and April 29, 2020 with overall 106 participants from LUISS Guido Carli: 52 for the Public Good game (PG hereafter) and 54 for the Ultimatum game (UG hereafter).¹

In PG sessions participants repeatedly interact for 10 rounds, randomly assigned to groups of 4, with individual per-round endowment of 25 tokens (1 token = 1€) and MPCR equal to 0.5. End-of-round feedback information includes aggregate contribution by other group members and own current and cumulative payoff. In addition to the show-up fee, participants receive 3% of the cumulative (across all rounds) payoff.

In UG sessions participants, who are permanently assigned to either Proposer or Responder role, play an Ultimatum game repeatedly for nine rounds, preceded by a single-round Dictator game

¹Average payment, including the show-up fee (6€), was 15.9€ for PG and 12.5€ for UG.

(DG hereafter) to elicit fairness concerns in absence of punishment and strategic uncertainty, with 10 tokens (1 token = 1.5€) to be shared in each round. Participants are randomly paired to play the DG and then rematched in the first round of the UG, which is played with constant partner thereafter. End-of-round feedback information include Proposer and Responder decisions as well as current and cumulative payoff. In addition to the show-up fee, participants received 10% of the cumulative (across all rounds) payoff.

3 “Lab on the Web” Architecture

Although the validity of online experiments has been demonstrated via successfully replicating a series of classic experiments (Crump et al., 2013, Amir et al., 2012, Horton et al., 2013, Hergueux and Jacquemet, 2015), concerns still exist regarding loss of experimenter control on dropouts (which are potentially endogenous and result in forced loss of experimental data, see Arechar et al., 2018), participants’ limited attention (Chandler et al., 2014 shows that subjects of online experiments may engage in activities such as watching TV or chatting, what negatively affects the quality of the experimental data) and the recruitment process (Peer et al., 2017). Our novel architecture overcomes these weaknesses and maintains the salient features of physical lab experiments, since it allows recruitment of participants from the standard subject pool, uses individual virtual cubicles and audio-video monitoring of subjects.²

More specifically, participants are recruited via Orsee (Greiner, 2015) and invited via email to individual virtual cubicles in the Cisco Webex Meetings platform.³ They are monitored via webcam and can communicate with the experimenter (but not with each other) via chat or microphone. Instructions are distributed via Google Drive⁴ (with download disabled) and read aloud using a recorded audio file in order to preserve common awareness. Participants perform the required tasks on Veconlab⁵ and, at the end of the experiment, they fill a questionnaire on LimeSurvey.⁶ Payments are administered via Prolific,⁷ which guarantees anonymity since Prolific IDs are not associated with the identity of participants.

²When recruited, participants were asked to accept the condition of being monitored (but not recorded) using a webcam.

³<https://www.webex.com/index.html>

⁴<https://www.google.com/drive>

⁵<http://veconlab.econ.virginia.edu/>

⁶<https://www.limesurvey.org/en/>

⁷<https://www.prolific.co/>

4 Consistency of our Methodology

The behavior observed in the games are in line with those well established in the experimental literature and, therefore, validate our novel architecture to garner lablike data online.

In particular, in PG average individual contribution across rounds amounts to 31.7% of per-round endowment. Furthermore, we confirm via regression analysis both, a (mild) end-game effect and conditional cooperation (see [Andreoni, 1988](#) and [Fischbacher et al., 2001](#)). In the single-round DG (see e.g. [Camerer, 2003](#), and [Engel, 2011](#)), average proposer demand amounts to 81.5% of the pie size, higher than in the nine rounds of the UG (57.65% of the pie size).⁸ Consistently with the literature (see, e.g., [Harrison and McCabe, 1996](#), [Güth and Kocher, 2014](#)), the (focal) equal-sharing demand is modal (46% of all proposer choices) across rounds and almost always accepted (98%). However, 21.13% of unequal, yet rather parsimonious, demands equal to six are rejected. Similarly, almost a third of demands equal to seven as well as to eight is rejected, although the latter rather ambitious demands are rare (2.47%).

5 Lockdown Evidence

We consider three features of the lockdown: self-reported length (more or less than six weeks), number of housemates (at most one, two and more than two) and whether participants are spending the lockdown in their hometown or not (situation). [Figure 1](#) and [Figure 2](#) report, respectively, mean contribution in PG and mean proposer demand in UG distinguishing by lockdown features.

⁸As expected, the difference between proposer demand in DG and average (across rounds) proposer demand in UG is statistically significant (p-value=0.000, paired t-test).

Figure 1: Mean contribution in PG (with 95% confidence intervals)

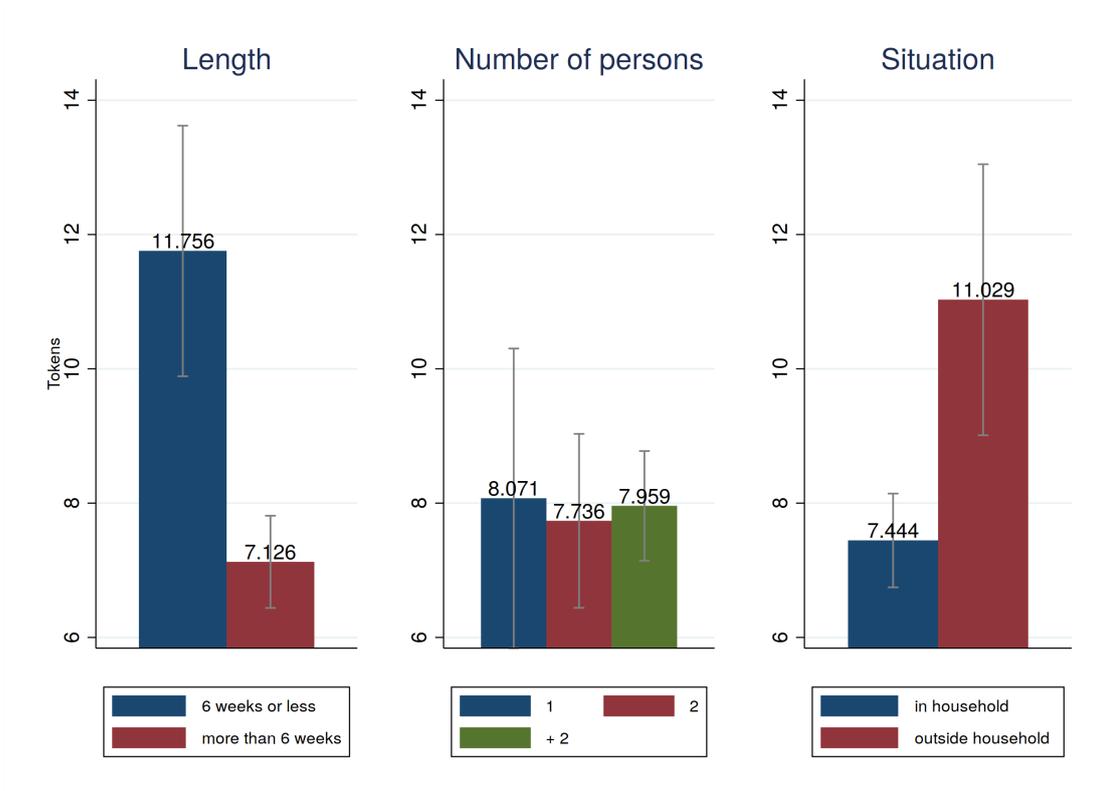
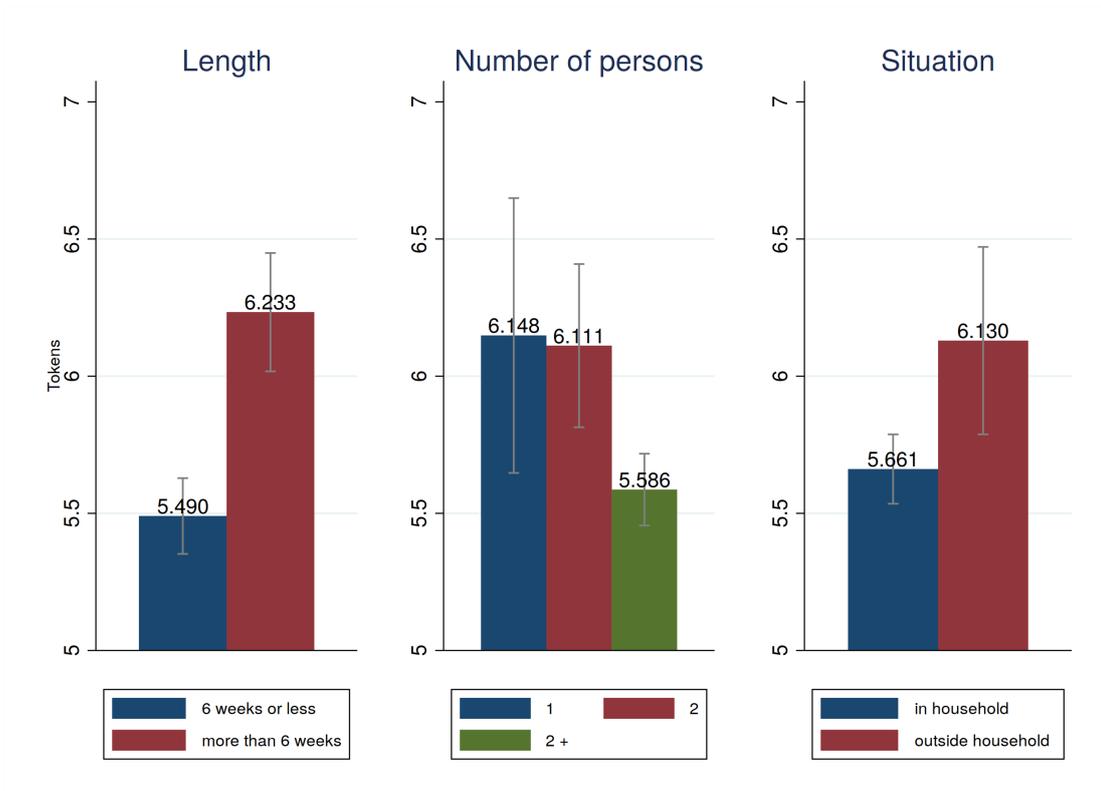


Figure 2: Mean proposer demand in UG (with 95% confidence intervals)



Our first descriptive finding is that the self-reported length of experienced lockdown is associated with lower cooperation and fairness: on average participants choose smaller contribution in PG and larger proposer demand in UG when they have been locked down for more than six weeks and these differences are statistically significant.

Our second descriptive finding is that mean contribution in PG does not vary significantly with the number of housemates, while mean proposer demand in the UG decreases when there are at least three housemates. Since the difference with the other two instances is statistically significant, this might suggest that living in a socially richer environment promotes fairness and increases awareness of strategic uncertainty.

Our third descriptive finding is that participants living away from their hometown during the lockdown on average choose larger contribution in the PG (and the difference with those living in their hometown is statistically significant) but also larger proposer demand in UG, what might suggest that being far from the own social environment promotes cooperation with unknown others, but also fosters more ambitious claims in sharing agreement.

In the regression analysis we estimate separately the effect of the three lockdown characteristics on individual contribution in PG (see [Table 1](#)) and proposer demand in UG (see [Table 2](#)).⁹ Model (1) includes the number of housemates (with baseline category equal to “more than 2”), model (2) includes a dummy for the length of experienced lockdown (with baseline equal to 6 weeks or less), and model (3) includes a dummy which equals 1 when being away from hometown during the lockdown. Furthermore, in the analysis of PG game choices we control for previous round individual and mean group contribution and of UG choices for previous round proposer demands, responder decision, and proposer demand in the single-round DG. All specifications include demographic controls (gender, age, geographic area and a dummy for students in Economics),¹⁰ level of self-reported risk aversion ([Dohmen et al., 2011](#)), and round dummies.

Overall, the regression analysis confirms the descriptive findings regarding the features of experienced lockdown on participants’ choices.

In PG, all model specifications in [Table 1](#) confirm conditional cooperation since higher group contribution in previous period has a positive and significant effect on own contribution in current period. The absence of sharp changes in individual contributions across rounds and the fact that

⁹We use a two-nested level model (individual and group levels) for contributions and a random effect model for demands.

¹⁰Demographic controls are not statistically significant. Full regression tables are available upon request.

Table 1: Multilevel estimates of individual contribution in PG

	(1)	(2)	(3)
Contribution ($t - 1$)	0.386*** (0.0441)	0.381*** (0.0442)	0.385*** (0.0441)
Other's contribution ($t - 1$)	0.223*** (0.0741)	0.202*** (0.0744)	0.197*** (0.0757)
Risk aversion	-0.836** (0.330)	-0.654** (0.300)	-0.671** (0.297)
Housemates: at most 1	-0.975 (1.648)		
Housemates: 2	-0.278 (1.235)		
Lockdown Length > 6 Weeks		-2.989** (1.342)	
Lockdown away from Hometown			3.326** (1.544)
Demographics	✓	✓	✓
Round dummies	✓	✓	✓
Observations	468	468	468
Number of groups	13	13	13

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

own contribution in the previous round is a determinant for the current one confirm intra-personal consistency of choices. Self-reported risk-aversion is always significant and negatively correlated with contribution to the public good, what might suggest that more risk-averse participant tend to self-insure against strategic uncertainty.

Regarding UG, results in [Table 2](#) show evidence of internal consistency of proposers and of positive and significant effect of responder acceptance in round $t - 1$ on proposer demands in t . Self-reported risk aversion has a significantly negative effect on proposer demand, suggesting that more risk-averse subjects are more concerned that ambitious demands can be perceived as unfair by responders and therefore more often rejected.

6 Conclusions

We show that lablike experimental data are suitable substitutes for lab data and allow to collect reliable evidence. The implementation of our web platforms went smoothly and constitutes a premise for interesting extensions and applications.

Our lablike experimental data suggest that attitudes toward fairness and cooperation are correlated with the circumstances in which our participants spent the lockdown. Specifically,

Table 2: Estimates from random effect model of proposer’s demand in UG

	(1)	(2)	(3)
Demand in DG	-0.0191 (0.0419)	0.0603* (0.0359)	-0.0316 (0.0468)
Demand ($t - 1$)	0.400*** (0.0636)	0.381*** (0.0643)	0.397*** (0.0639)
Responder’s acceptance ($t - 1$)	0.387*** (0.135)	0.372*** (0.134)	0.384*** (0.135)
Risk Aversion	-0.101** (0.0504)	-0.0985** (0.0434)	-0.104** (0.0520)
Housemates: at most 1	0.177 (0.317)		
Housemates: 2	0.476** (0.227)		
Lockdown Length > 6 weeks		0.801*** (0.206)	
Lockdown away from Hometown			0.440* (0.263)
Demographics	✓	✓	✓
Round dummies	✓	✓	✓
Observations	216	216	216
Number of individuals	27	27	27
Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$			

participants are more cooperative and more selfish when isolation is stronger, in particular when spending the lockdown away from their hometown. However, cooperation decreases, while selfishness increases, when the lockdown becomes longer.

This evidence suggests that the costs of “social distancing”, represented by the reduction of social interaction, could be mitigated by increasing “social embeddedness”, i.e. the possibility to cope with the background risk of the epidemic event in a “comfort zone”.

References

- [1] AMIR, O., D. RAND, AND Y. KOBI (2012): “Economic Games on the Internet: The Effect of \$1 Stakes”, *PloS One*.
- [2] ANDREONI, J. (1988): “Why free ride?: Strategies and learning in public goods experiments”, *Journal of Public Economics*, Vol. 37, No. 3, pp. 291–304.
- [3] ARECHAR, A., S. GÄTCHER, AND L. MOLLEMAN (2018): “Conducting interactive experiments online”, *Experimental Economics*, Vol. 21, No. 1, pp. 99–131.

- [4] CAMERER, C. (2003): *Behavioral Game Theory. Experiments in Strategic Interaction*, Princeton, New Jersey: Princeton University Press.
- [5] CHANDLER, J., P. MUELLER, AND G. PAOLACCI (2014): “Nonnaiveté among Amazon Mechanical Turk workers: Consequences and solutions for behavioral researchers”, *Behavior research methods*, Vol. 46, pp. 112–130.
- [6] CRUMP, M., J. MCDONNELL, AND T. GURECKIS (2013): “Evaluating Amazon’s Mechanical Turk as a tool for experimental behavioral research”, *PloS One*, Vol. 8(3): e57410.
- [7] DOHMEN, T., A. FALK, D. HUFFMAN, U. SUNDE, J. SCHUPP, AND G. G. WAGNER (2011): “Individual risk attitudes: Measurement, Determinants, and Behavioral Consequences”, *Journal of the European Economic Association*, Vol. 9, No. 3, pp. 522–550.
- [8] ENGEL, C. (2011): “Dictator games: a meta study”, *Experimental Economics*, Vol. 14, pp. 583–610.
- [9] FISCHBACHER, U., S. GÄCHTER, AND E. FEHR (2001): “Are people conditionally cooperative? Evidence from a public goods experiment”, *Economics Letters*, Vol. 71, No. 3, pp. 397–404.
- [10] GREINER, B. (2015): “Subject Pool Recruitment Procedures: Organizing Experiments with ORSEE”, *Journal of the Economic Science Association*, Vol. 1, No. 1, pp. 114–125.
- [11] GÜTH, W. AND M. KOCHER (2014): “More than thirty years of ultimatum bargaining experiments: Motives, variations, and a survey of the recent literature”, *Journal of Economic Behavior & Organization*, Vol. 108, No. C, pp. 396–409.
- [12] HARRISON, G. AND K. MCCABE (1996): “Expectations and Fairness in a Simple Bargaining Experiment”, *International Journal of Game Theory*, Vol. 25, No. 3, pp. 303–327.
- [13] HERGUEUX, J. AND N. JACQUEMET (2015): “Social preferences in the online laboratory: a randomized experiment.”, *Experimental Economics*, Vol. 18, pp. 251–283.
- [14] HORTON, J., D. RAND, AND R. ZECKHAUSER (2013): “The online laboratory: Conducting experiments in a real labor market”, *Experimental economics*, Vol. 14, pp. 399–425.
- [15] PEER, E., L. BRANDIMARTE, S. SAMAT, AND A. ACQUISTI (2017): “Beyond the Turk: Alternative platforms for crowdsourcing behavioral research”, *Journal of Experimental Social Psychology*, Vol. 70, pp. 153–163.