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Seminar thesis

German Covid-19 Policy Interventions: A Cooperation Study

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Abstract

This research analyzes one's willingness to cooperate with public policies and the way government interventions are framed in the current context of the Coronavirus pandemic. The results unfold a positive change in behavior once an emphasis framing was used, implying that subjects became more cooperative with certain government interventions, as well as shown weak associations between one's particular conditions and his average willingness to cooperate.

1. Introduction

The usage of framing techniques in politics is widely known, for example during campaigning, yet not exclusively studied during crisis. For this reason, wouldn't it be interesting to know if framing can be helpful amidst impasses? Therefore, this paper tries to extend the connection between politics and framing by analyzing one's willingness to cooperate with respect to public policies created to constraint the spread of Coronavirus (Covid-19).

By raising the question, "How does government intervention, amidst Covid-19, correlate with one's willingness to cooperate?", this study is further guided by two hypotheses. The first concerns a causal investigation between the usage of framing and an increase in one's willingness to cooperate. The second hypothesis regards a correlation examination of one's characteristics and his average willingness to comply with the policies considered.

As experimental research, this paper collects self-evaluations on how likely or willing subjects are to cooperate with specific German government interventions based on a given perception of the measures. Regarding the first hypothesis, results suggest an increase in cooperation upon the use of emphasis framing, and calculations indicate weak associations between all the particular parameters analyzed and one's average willingness to cooperate in the second hypothesis.

1.1 Literature Review

Many papers adduce that framing techniques influence one's perception of what is or is not important (e.g., Nelson 2019, Bütler & Marechal 2007). Only upon a change in one's action or behavior, a framing effect is considered to be successful. There are many different types of framing methodologies: valence, equivalency and emphasis framing are all examples of it. The technique applied in this study is the emphasis framing. According to Druckman (2001), the emphasis framing is successful once a change in behavior is observed because the information has been presented with different weights. Applying this concept into our research, we perform the weight-setting by changing the amount of information provided about each policy analyzed. For example, by inserting facts about the advantages of certain measures rather than asking a direct question.

Framing is one of the various nudging techniques. Nudges can have different forms, but its purpose is always the same. It cares about influencing behavior by gently altering the choice architecture underlying a situation (Thaler & Sunstein 2008). Implementing this concept in our research, we first have an environment setting with no choice architecture. In this setup, participants make decisions by their default perception of reality. Then a switch is introduced, altering the context setting. This change in the system is the emphasis framing in our research, and now subjects are, theoretically, induced to make decisions based on their perception of the altered reality.

Based on Nelson's argumentation (2019), political outcomes are connected to emphasis framing, as well as to changes in public policies. However, could it be also linked to the likelihood of one's willingness to cooperate with government interventions? This is where the main contribution of this study takes place. Additionally, the policy scope of this study is reduced to 6 measures: Usage of face protection, Social distancing, School closure, Lockdown, Travel restrictions and Centralized quarantine, respectively. With these policies in mind, the paper can potentially yield interesting insights for researchers investigating the effectiveness of these same measures (Chen, X. & Ziyi, Q. 2020).

2. Experimental design

In Figure 1 the research design used to answer both hypotheses is depicted. The study is composed of a series of questions, which are divided into three blocks.

Figure 1: Research design
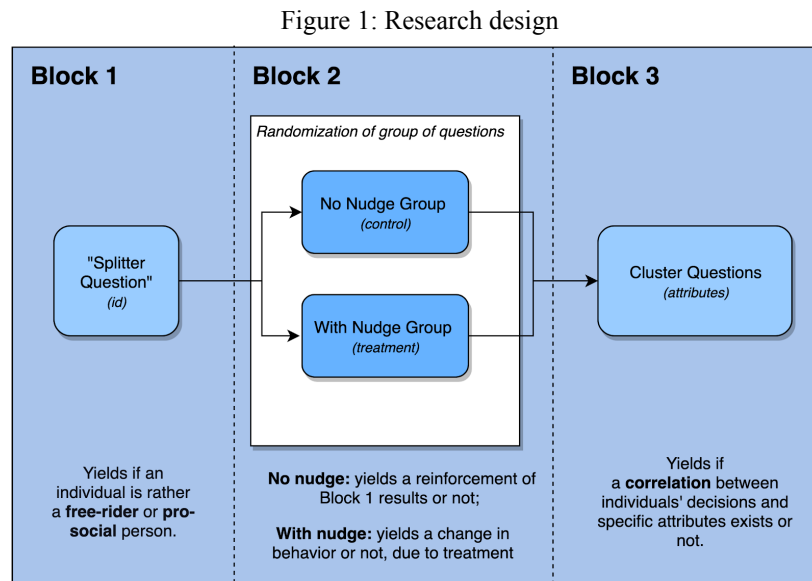
Source: Own illustration

The first part of the survey concerns a universal question that all participants must answer. This section enables subjects to self-evaluate in general how agreeable they are regarding the German government responses against Covid-19. This process is entitled "Splitter Question" (see Figure 1, "Block 1") because it splits subjects into free-rider, someone who does not agree with the measures and is more likely to not comply with them, and pro-social, someone who does agree with the measures and is, therefore, more likely to cooperate with them. This self-evaluation part served as an introduction to the questionnaire. It had no impact on the analysis of the survey, meaning that the participants were not assigned to a control or treatment group according to their classification (if a person is a free-rider or prosocial) in this block.

2. 1 Hypotheses

Part two of the survey is where the first hypothesis of this study takes place, which is about whether or not, a change in the framing of the policies can increase individual cooperation. In the study flow after the "Splitter Questions" subjects are randomized into one out of two groups of questions (see Figure 1, "Block 2").

There is the control group, which states questions about each policy analyzed in a short non-informative way that does not contain any sort of choice architecture. One question example, within the control group of questions, is about the "Social Distancing measure": *"How much do you agree that the social distancing order is useful to combat Covid-19?"*. All the other policies also have a non-informative question of themselves in this sample.

The second group is the treatment group, which contains reciprocal questions from the control group but now with a choice architecture instead. The technique applied to nudge an increase in participant's willingness to agree with the measures was by changing the frame of the question to a more informative style. The reciprocal "Social Distancing measure" question in the treatment group is: *"Covid-19 is* said to be contracted also via air. A distance of 1,5 meters can make the difference between having an infection or not. How much do you agree that the social distancing order is useful?"*. Just like the social distancing policy, all other interventions have an informative question version of themselves within the treatment group.

The final part of the survey is also universal, meaning that all participants in either group have to answer. This section is entitled "Cluster Questions" (see Figure 1, "Block 3"), all questions concern specific attributes that can vary upon individuals. From each question, one characteristic is collected, and at the end, for each observation, it is known the subject's sex (Male or Female), location (An urban area or Rural area), risk group status (Yes or No) and age group (18-24, 25-34, 35-44, 45-54, 55-64 and 65+). This part of the survey is where the second hypothesis is investigated. Upon the data collected, associations between the personal conditions and one's average cooperation are examined.

2. 2 Implementation

The experiment ran for a total of 12 days and took place via an online survey through "Qualtrics.com". The survey is a one-time questionnaire with no incentive nor active control of responses**.** In total, after preprocessing the data, the study had 91 observations. The control sample contains 47 participants, while the treatment sample 44 participants. The main distribution channel of this survey was student forums and groups.

2.3 Parameter choice

The response scale for blocks one and two contains six variables ranging from 1 (High willingness to cooperate) to 6 (Low willingness to cooperate). For the causal investigation (Hypothesis number one) the variables chosen are the participant's willingness to cooperate with each policy investigated across samples, respectively: Face protection, Social distancing, School closure, Travel restriction, Lockdown, and Centralized quarantine.

For the correlation examination (Hypothesis number two) the variables used are the subject's particular attributes, respectively: sex, location, risk group status and age, and his average willingness to cooperate. The average willingness to cooperate is entitled "Score", and is calculated by summing all individual policy willingness and dividing them by six - the total number of policies. In other words, the score variable is the mean perception of one person towards the six policies of his respective group.

2.4 Design reservations

The first caveat of this research design, based on the current conditions (amidst Covid-19), is the fact that no incentive nor control of the responses was performed. This has very likely influenced the number of valid observations collected, once before preprocessing the data, a total of 114 observations was collected yet 23 of them were not completed. The second reservation concerns the distribution channels used which were mainly student groups. This sharing strategy impacted the survey by adding a disproportional amount of observations of a specific age group, respectively age cluster "18-24".

3. Results: Statistical Analysis

In order to get an intuition of the data, the distribution of the results is visualized in histograms. All histograms plot the distribution of answers of both samples, control and treatment, together. In the x-axis, the "Cooperation Scale" is outlined, while in the y-axis the frequency of responses is displayed. Table 1 is a reminder of the cooperation scale used.
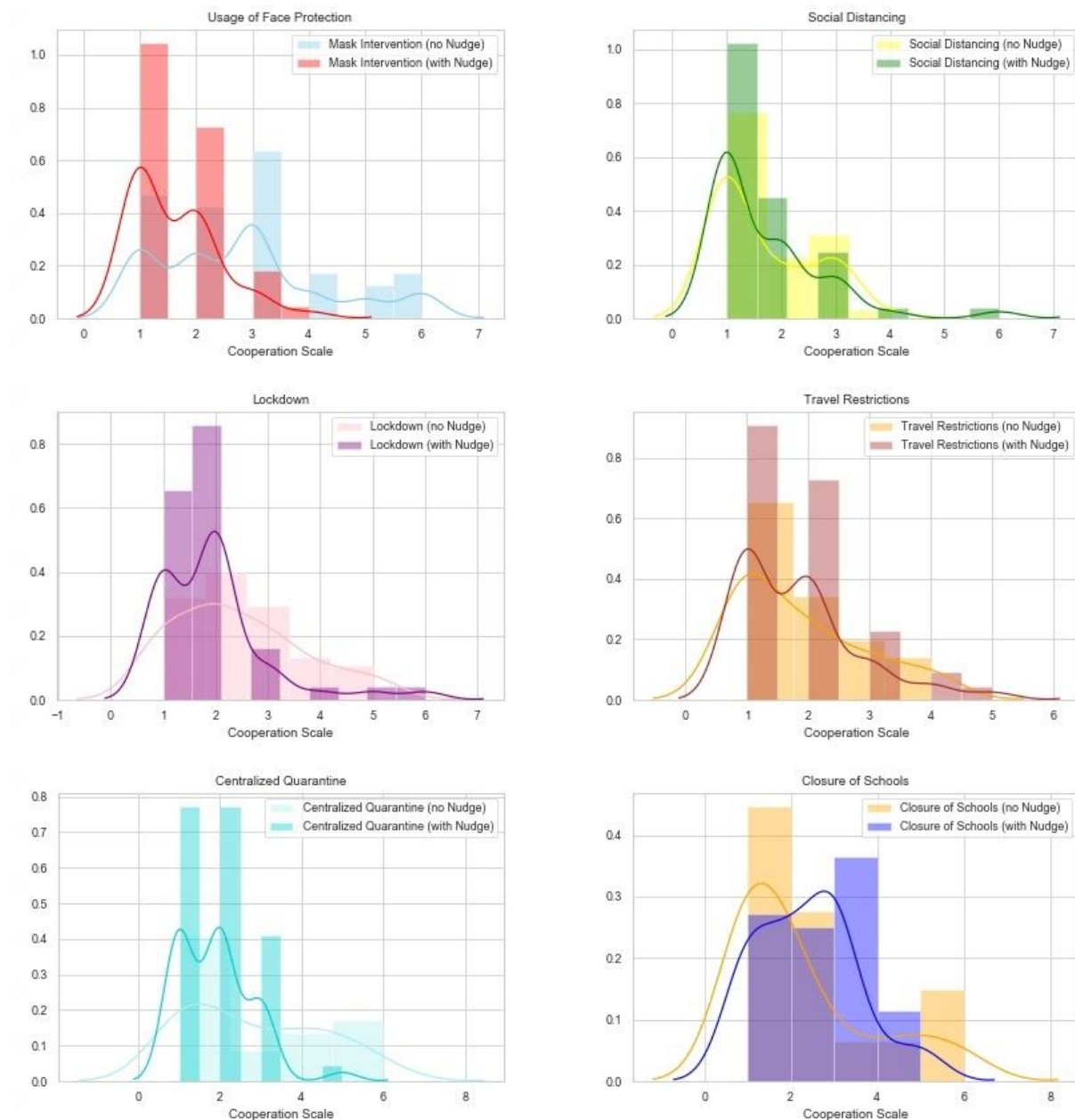
Table 1: Cooperation Scale

Extremely willing to cooperate	Moderately willing to cooperate	Slightly willing to cooperate	Slightly unwilling to cooperate	Moderately unwilling to cooperate	Extremely unwilling to cooperate
1	2	3	4	5	6

Based on the scale used, the lower the score the better. Implying that shifts to the left of the histogram are appreciated once it indicates a higher willingness to cooperate with measures against Covid-19. The assumption of the study is: to be willing to cooperate with the policies is always the best behavior for everyone, once it reduces contamination.

Figure 2 depicts a policy-by-policy distribution of all public measures. Each subplot illustrates the distribution of the control and treatment version of one specific measure. Subplots' titles indicate the public policy, while the legend and the color the respective sample.

Figure 2: Policy-by-policy distribution

Table 2 shows the population parameters, mean, standard deviations, and coefficient of variation (CV) for the control sample. Based on the statistics presented, one can say that on average individuals are willing to cooperate with all the policies and all measures have low-variance because of the CV <= 1.

Table 2: Policy-by-policy statistics **(Control sample)**

Control Group	Face Protection	Social Distancing	School Closure	Lockdown	Travel Restriction	Centralized Quarantine
Mean	2.80	2.45	1.70	1.87	2.26	2.85
Standard Deviations	1.50	1.23	0.9	1.03	1.59	1.67
Coefficient of Variation	0.53	0.5	0.53	0.55	0.7	0.58

Source: Own illustration

Table 3 displays the same population parameters as Table 2, but now for the treatment sample. The statistics presented indicate that on average individuals are also willing to cooperate with all the policies and all measures have low-variance because of the CV <= 1.

Table 3: Policy-by-policy statistics **(Treatment sample)**

Treatment Group	Face Protection	Social Distancing	School Closure	Lockdown	Travel Restriction	Centralized Quarantine
Mean	1.61	1.93	1.7	1.81	2.39	1.88
Standard Deviations	0.75	1.07	1.04	0.97	1.15	0.89
Coefficient of Variation	0.47	0.55	0.61	0.54	0.48	0.47

Source: Own illustration

3.1 Hypothesis I Results

With the distributions and sample population parameters in mind, the study performed a two-sample Student's T-test to investigate the first hypothesis of this study, which explores if a switch in the policy framing increases one's willingness to cooperate.

Null Hypothesis: Emphasis framing has no effect. The mean does not change.

Alternative Hypothesis: Emphasis framing has an effect. The mean does change.

Table 4 presents the t-statistic and p-value of the T-tests ran between both samples. Policies with a p-value smaller than a significance level of 0.05 (5%) correspond to the measures in which an emphasis framing had a significant effect on the population parameter.

Table 4: Student's T-test results

|	Face Protection	Social Distancing	School Closure	Lockdown	Travel Restriction	Centralized Quarantine
T-statistic	4.75	2.13	- 0.01	0.26	-0.45	3.47
P-value	0.000011	0.035	0.99	0.8	0.65	0.0009

Source: Own illustration

Upon the results, from the six public policies analyzed half of them were affected by the treatment used (Emphasis framing). The respective policies were Face protection, Social Distancing, and Centralized Quarantine. The other government interventions, School closure, Lockdown, and Travel restriction, were not affected by the switch in the environment. Nevertheless, an effect occurs and for this reason, it is possible to say that emphasis framing can affect how willing individuals can be towards government interventions.

3.2 Hypothesis II Results

To answer the second hypothesis, this study examined associations between the categorical variables collected and the average score of the participants within each group. It is important to highlight that the categorical variables vary, all of them are dichotomous variables despite the variable: "Age Group". For this reason, different statistical analyses were used.

Dichotomous variables were investigated using a Point Biserial Correlation, which yields Pearson's coefficients. Figure 3 is the visualization of the correlation matrices for each group between binary variables (Sex, Location, and Risk Group) and the average score.

Figure 3: Correlation Matrices
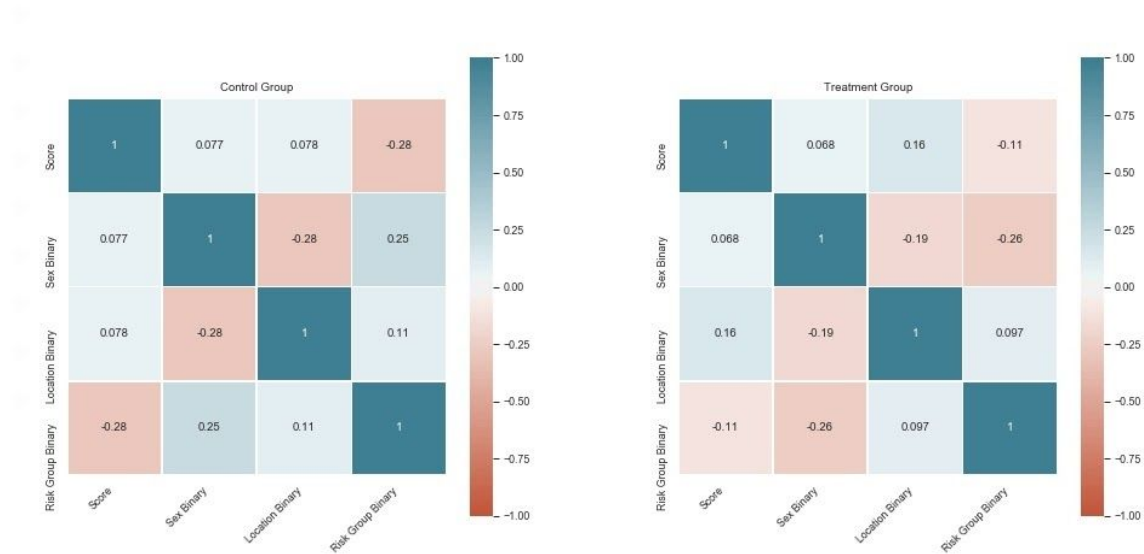
Source: Own illustration

The common trend observed in Figure 3 is the low degree of association once no matrix coefficient lies beyond positive or negative 0.29 and, therefore, it indicates a small correlation between the personal condition variables and the average willingness to cooperate. Even though it is possible in Figure 3 to recognize the type of associations, distinguishing between positive and inverse correlations, Figure 4 and Figure 5 present the information more clearly because the y-axis is used as a cooperation scale reference.

Figures 4 and 5 have the same encoding. The attributes of being male, living in a rural area, and having no risk group status have the binary value zero, while being female, living in an urban area, and having a positive risk group status are encoded with the binary value one.
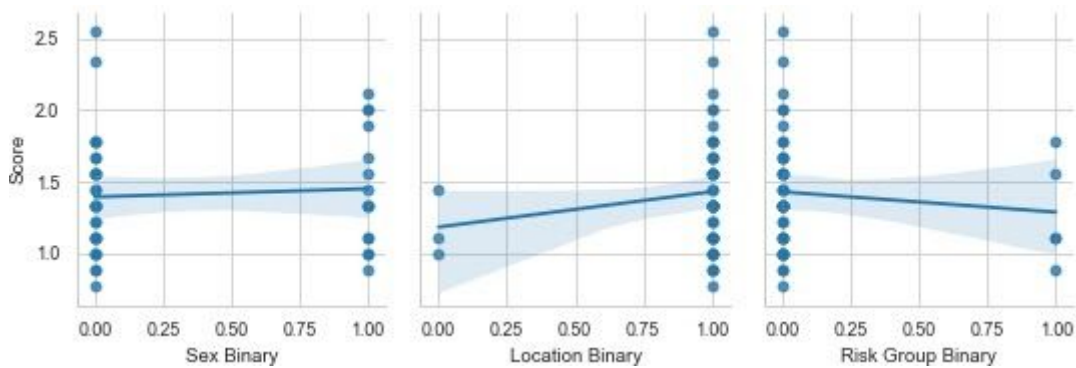
Figure 4: Control sample correlation directions
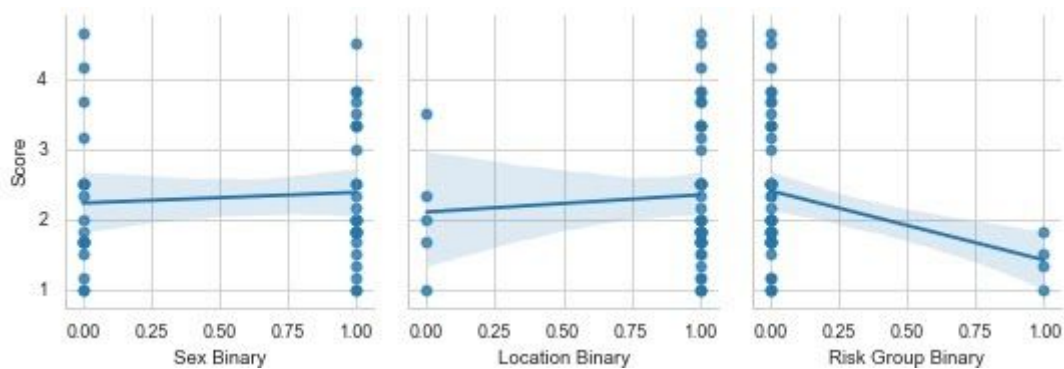
Source: Own illustration

According to Figure 4, individuals from the control sample who are females, live in urban locations, and have a negative risk group status are more likely to have an average score less cooperative.

Figure 5: Treatment sample correlation direction

Source: Own illustration

According to Figure 5, observations from the treatment sample present similar associations to the ones seen in Figure 4, but now with a more cooperative y-axis. However, the direction of the correlations remains the same as in Figure 4.

For the Age Group variable, an investigation of variance was performed using the ANOVA technique. The association analyzed here is the same as with the other variables, consequently the relationship between Age Groups and the average score of the participants within each group. Table 5 contains the results of running ANOVA between these parameters.

Table 5: ANOVA Age-Average score results

	F-score	P-value
Control Group	1.44	0.24
Treatment Group	1.40	0.26

Source: Own illustration

According to Table 5, both samples have a very small F-score which indicates low variance between the average scores and age groups, as well as a low degree of association.

3.3 Analysis Reservations

The first limitation concerns the distribution of the samples. Due to the small number of observations all distributions are skewed, originating inconsistencies in the statistical methods used, which have normality as one requirement. Finally, a second caveat combines the distribution channel reservation and the analysis. Sharing the research mainly with students, a disproportionate amount of the observations were between 18 and 24 years old, while in some other age clusters a very small amount of observations, if not none, occurred. Respectively, impacting variation within the age groups and consequently influencing the statistical methods that assume, in theory, equal variance. If this said, results show a low degree of association between the attribute parameters and one's average willingness to cooperate, but in reality, more diversity in the data would be required to make a more precise statement.

4. Conclusion

First, emphasis framing affects individual willingness to cooperate with public policies against Covid-19. By disregarding all caveats presented in this research, it is reasonable to say that the causality observed could potentially be useful for other impasses in which the government needs to act efficiently and by mobilizing the highest number of civilians possible. In other words, emphasis framing might be a political tool to increase cooperation in moments when public compliance is needed.

Again with the study's reservations aside, it is possible to say that one's average willingness to cooperate has a low degree of association with the particular parameters considered. Consequently, one insight from this information can be the fact that governments will not find it helpful to customize cooperation campaigns during a crisis based on location or sexuality parameters for instance, but maybe by other variables which are not the scope of this paper.

If the research limitations are accounted for, the results present little value. Nonetheless, reservations do not deny how interesting and valuable the relationship between cooperation and framing can be, especially once applied in the big picture of government intervention during crises because there are certainly more impasse to come.

References

Barrot, J-N, B Grassi & J Sauvagnat (2020). Sectoral effects of social distancing. *Covid Economics Vetted and Real-time Papers, CEPR*, Issue 3, 10 April.

Bütler, M. & Marechal, M. (2007). Framing Effects in Political Decision Making: Evidence from a Natural Voting Experiment. Research Gate, https://www.alexandria.unisg.ch/37081/

Chen, X. & Ziyi, Q. (2020). Covid-19: *Government interventions and the economy*. CEPR.

Druckman, J. N. (2001): "The Implications of Framing Effects for Citizen Competence", Political Behavior , Vol. 23, pp. 225–256.

Fischbacher, U., Gächter, S. & Fehr, E. (2001). Are people conditionally cooperative? Evidence from a public goods experiment. *Economics Letters*, 71(3):397-404.

Nelson, T. E. (2019). Emphasis Framing and Political Decision Making. *Oxford University Press,* https://doi.org/*10.1093/acrefore/9780190228637.013.965*

Thaler, R. & Sunstein, C. (2008). Nudge. *Penguin Books*

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