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The Health-Wealth Trade-off during the COVID-19 Pandemic: Communication Matters

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ABSTRACT

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How do people balance health/wealth concerns during a pandemic? And, how does the communication of this trade-off affect individual preferences? We address these questions using a field experiment involving around 2000 students enrolled in a large university in Italy. We design four treatments where the trade-off is communicated using different combinations of a positive framing that focuses on protective strategies and a negative framing which refers to potential costs. We find that positive framing on the health side induces individuals to give greater relevance to the health dimension. The effect is sizeable and highly effective among many different audiences, especially females. Importantly, this triggers a higher level of intention to adhere to social distancing and precautionary behaviors. Moreover, irrespective of the framing, we find a large heterogeneity in students' preferences over the trade-off. Economics students and students who have directly experienced the economic impact of the pandemic are found to favor wealth-centered policies.

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1. Introduction

The Covid-19 health emergency prompted governments around the World to adopt unprecedented measures in order to control the spread of the infection. These measures involved the curtailment of basic individual freedoms which ranged from the total lock-down of economic and social activities to the adoption of precautionary behaviors such as the wearing of masks and the maintaining of interpersonal distance. However, it is quite evident that the efficacy of these measures is strictly related to people's compliance, which in turn depends on whether or to what extent people agree with them (Hargreaves Heap et al., 2020). Self-isolation, social distancing and other precautionary individual behaviors are extremely difficult to impose without people's willingness to cooperate.

In the absence of financial incentives, a key role for the enforcement of Covid-19 related measures might be played by communication and persuasion policies as "individual compliance has collective benefits, but full enforcement is costly and controversial" (Briscese et al., 2020). In this paper, we investigate how the framing of the communication of Covid-19 related issues to the public affects individual preferences and, ultimately, their intention to adhere to precautionary behaviors.

We focus on a key aspect of Covid-19 related measures: the inherent health-wealth trade-off that they have to deal with. Quasi-complete lockdown policies implemented by many governments worldwide have mitigated the extent of the spread of the contagion but have also given rise to very considerable economic costs (Acemoglu et al., 2020; Allcott et al., 2020; Alvarez et al., 2020; Barro, 2020; Eichenbaum et al., 2020; Friedson et al., 2020; Lee et al., 2020; Lin and Meissner, 2020; McKibbin and Fernando, 2020; Wren-Lewis, 2020; Gibson and Xiaojin, 2020).[1] The less costly alternatives, e.g. targeted lockdown policies - which often characterize the re-opening phase - make even more explicit the health/wealth trade-off and such a dilemma can only be expected to persist until a medical response becomes available. As the health-vs-wealth trade-off confronting the social planner is ultimately based on the value that society puts on population health versus

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[1] The International Monetary Fund (2020) report that "as a result of the pandemic, the global economy is projected to contract sharply by – 3 percent in 2020, much worse than during the 2008–09 financial crisis". In Italy, one of the countries most affected by the outbreak, it has been calculated that each week of closure of all non-essential activities caused a loss of the 0.5-0.75% of the GDP (Centro Studi Confindustria, 2020; Bank of Italy, 2020). Considering the period of lock-down observed in Italy, this translates into a reduction of the GDP of around 4-6% in just two months.

short-term economic gains, it is therefore essential to understand how people evaluate health versus wealth and to identify which factors influence their preferences.

We investigate how the framing of communication over both sides of the trade-off affects individual preferences over the policies to be implemented by using a survey field experiment which involved around 2000 students enrolled in a major university in Italy in April 2020. Italy is one of the countries which was most affected by the outbreak and among those expecting very high economic losses (Barba Navaretti, et al. 2020).[2] The key question of the survey asked individuals to reveal their preferences of policies that gave a different weight to the health and economic aspects of the pandemic. We manipulate the framing of the introductory text of the question associated with the two elements of the trade-off comparing a positive framing which focuses on the protection of health/economic conditions with a negative framing that presents one or both elements of the trade-off in terms of costs.

We induce the positive framing for health and wealth using the word *protection* and the negative framing using the word *costs*. The choice of the framing - in particular the positive one - is inspired by the language used by politicians and the media during the lockdown in Italy in which expressions such as "health protection" or "health safeguard" have been principally used.[3] For instance, on February 26th (during the initial phase of the epidemic), the Italian Government's bill including the closure of schools and many economic activities was presented by the ministry of Health as "Actions for the protection of community health".[4] "La Repubblica", one of the most widely read Italian newspapers, published 29 articles mentioning the phrase "health protection" during the lockdown phase.

Based on the existing evidence related to the effects of framing (Davis and Bobko, 1986; Jain et al., 2020; Krishnamurthy, Carter and Blair, 2001), we hypothesize that individuals are more likely to choose health - (wealth) oriented policies when health (wealth) is framed positively instead of negatively. In fact, it is

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[2] The outbreak has mostly affected the North of Italy. However, the South of Italy, despite experiencing lower rates of contamination and death, is much weaker from an economic point of view and the health care service delivery is perceived to be of very poor quality in this area. According to the last report of the Demoskopika (2019), less than the 20% of the citizens living in the South of Italy reported to be satisfied with the local health care organization *vs* the 30% in the Centre of Italy and the 50% in the North of Italy.

[3] Dybowski and Adämmer (2018) investigate whether the US president's tax policy communication affects economic activity through a sentiment channel. The authors consider the use of positive and negative words in documents and speeches and show that positive tax policy news by the president stimulates private consumption, investment and output.

[4] Text of the press conference by the Italian ministry of health on February, 26th available here: http://www.salute.gov.it/portale/malattieInfettive/dettaglioNotizieMalattieInfettive.jsp?lingua=italiano&id=4086

generally found that, when the framing is positive, subjects view the outcomes as gains (showing risk aversion) while, when the framing is negative outcomes are perceived as losses (leading to risk seeking).[5] A similar hypothesis applies if we consider the link between the two elements of the trade-off. In fact, the worsening of health or wealth in the trade-off can be perceived either as a cost or as a loss. The *dead-loss effect* (Thaler, 1980; Kahneman and Tversky, 1984) posits that an individual's subjective state can be improved by framing negative outcomes as costs rather than as losses. In our context, this means that individuals should be more willing to sustain the costs of the worsening of health or of the economic situation if such a payment is seen as the cost for the protection of the other element of the trade-off, instead of an uncompensated loss. Therefore, our hypothesis is that communicating the trade-off by using a positive framing (*protection*) for one element and a negative framing (*cost*) for the other, instead of negative framing for both, will shift preferences towards the positively framed element and will motivate individuals to be more willing to sacrifice the negatively framed element.

We find that preferences over the trade-off vary depending on how the trade-off is communicated. More precisely, we find that when the trade-off is framed as economic costs to be sustained in order to protect against a worsening of health - compared with the framing where both elements are expressed as costs - a large majority of students give strong priority to the health dimension, deciding to care less about the economic costs to be sustained in return for health protection. Under this framing, 47.36% of students answered that they would prefer policies that consider "extremely" or "very much" the protection of health and "not much" or only a "little bit" the costs for the worsening of the economic situation. Conversely, under the negative framing, 34.15% of students answered that they would prefer policies that consider "extremely" or "very much" the costs for health and "not much" or a "little bit" the costs for the worsening of the economic situation. This is in line with prospect theory - as the positive framing induces risk aversion - and with the *dead-loss effect*. This also supports a large body of empirical evidence showing that the framing strategy is highly relevant for the adoption of healthy behaviors (eg. Bertoni et al., 2020, Krishnamurthy, Carter and Blair, 2001).[6]

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[5] Prospect theory (Tversky and Kahneman, 1979) predicts that individuals' choices will differ depending on whether the domain of outcomes is a gain or a loss. See Kuhberger (1998) for a meta-analysis on the influence of framing on risky decisions.

[6] There is also literature showing that gain-framed messages exert a positive effect on health-enhancing activities such as walking and exercising (Mikels et al., 2016; O'Keefe and Jensen, 2007 for a review).

Combining health with a positive framing seems to be a low-cost but highly effective communication strategy. In fact, when digging deeper to see whether only audiences with particular characteristics are affected by the positively framed communication, we find that the effect is quite homogeneous, even if women, altruistic and trustworthy individuals are found to be particularly reactive.

Regardless of framing, students' preferences over the health-wealth trade-off are highly influenced by a number of individual characteristics. The field of study (i.e. studying economics) and a difficult household economic situation appear to be the main determinants of a higher weight being given to the economic dimension of the pandemic. Individuals with more highly educated parents, those who feel more anxious and those with altruistic feelings, seem to assign more weight to the health dimension. Lastly, we also find that students who position themselves more on the health side of the trade-off are more likely to show stronger intentions to comply with official advice for self-isolation and precautionary behaviors. Using an IV-framework exploiting the random assignment to the framing experiment, we also find support for the causality of the relationship running from trade-off perception to compliance with prescribed behaviors.

This paper contributes to the research on framing effects. Beginning with Tversky and Kahneman (1981), it has been shown that different framings affect the perceived domain of the outcomes thus leading to different choices. The relevance of framing in influencing individual behavioral patterns has been widely documented in a variety of contexts, e.g. in public-sector decision making (Davis and Bobko, 1986), in health decisions (Krishnamurthy, Carter and Blair, 2001) and consumer choices (Jain et al., 2020). We complement this literature by analyzing framing effects in a new and previously unexplored setting, i.e. in the midst of an emergency involving two key dimensions of individual well-being such as health and wealth.

We also contribute to the literature in political science that has started to apply behavioral economics insights to the study of political processes (see Schnellenbach and Schubert, 2015, for a survey). A number of papers has considered the importance of framing in decision-making and applied prospect theory to explain the behavior of governments and leaders in crisis situations (see Boettcher, 2004; McDermott, 2004; Mercer, 2005, Linde and Vis, 2014; Loewen et al., 2014). Quattrone and Tversky (1988) show that the decision whom to vote for is strongly influenced by the way policy programs are described. Other works highlight how the political supply side can use some well-known biases, such as loss aversion or the status quo bias, in order to manipulate the evaluation of alternatives. Chong and Druckman (2007) show that whether labor market

policies are presented as aiming at lower unemployment or higher employment makes a great difference for public opinion. Other works show that when the outcome of a policy is perceived as a loss, the propensity to take risks to mitigate the situation increases, while when a policy creates benefits that are also perceived as gains, the willingness to take risks to achieve even better results diminishes (Levy, 1997; Mercer, 2005; McDermott, 2004, Kuehnhanss et al. 2015). Our paper contributes to this literature by investigating a special setting in which - in absence of a direct political competition - citizen's biased decision-making might be primarily exploited by policy-makers in order to spread pro-social behaviors and thus support the crisis management.

Our paper also speaks to a growing stream of Covid-19 economics literature that is investigating individual perceptions over the health-wealth trade-off and compliance with recommended behaviors. For instance, Hargreaves Heap et al. (2020) show that how people evaluate health versus wealth and compliance with prescribed behaviors depends on the information they receive[7]. They randomize information provision on economic and health costs of the pandemic to assess public preferences over this trade-off and find that people's relative valuation of health over wealth seem to change in predictable ways as the experience of death and income loss unfolds. Importantly, they also find that those who choose the maximum valuation of health over wealth are more likely to comply with appropriate behaviors. Likewise, Settele and Shupe (2020) study the role of cost-benefit considerations in shaping support for mandatory social distancing and stay-at-home measures by varying information on perceived economic costs and health benefits in an experimental setting. However, to the best of our knowledge, no previous paper so far has focused on the role of communication in shaping individual preferences on this trade-off.

Our finding that a positive framing on the health side of the trade-off induces people to worry and care more about health provides useful insights to public authorities on how to tailor the policy message after the end of lockdown measures. Framing the measures adopted in terms of "protecting" health could motivate people to place more weight on health concerns and might also increase their compliance with recommended behaviors, helping to control and limit the spread of the virus. This, in turn, could allow policymakers to focus more on the economic consequences of the pandemic.

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[7] The relevance of communication has been investigated also in other domains. For instance, Büchel (2013) analyzes the communication by the Eurozone's leading decision-makers in the European debt crisis.

The remainder of the paper is structured as follows. Section 2 describes the experimental design, data and balance checks. In Section 3 we discuss our main results. Section 4 is devoted to investigate heterogeneous effects across different groups, while Section 5 investigates the relationship between health-wealth preferences and precautionary behaviors. Section 6 concludes.

2. Experimental Design, Data and Balance Checks

We study the effect of different communication strategies on individual preferences regarding the trade-off between health and economic concerns by collecting survey data within a field experiment (randomized controlled trial, RCT).

The survey was submitted to about 10,000 students[8] enrolled at the University of Calabria[9] on April 20th and remained open until April 25th. Students were randomly assigned to four treatment groups on the basis of their matriculation number.[10] Participation in the survey was voluntary and data were collected anonymously. The response rate to our survey was 17.5%.

The four treatment groups were created by manipulating the framing associated with the two elements of the trade-off, thus enabling comparisons between a positive framing which focuses on the protection of health/economic conditions with a negative framing that presents one or both elements of the trade-off in terms of costs. The survey question which was used to induce treatment conditions was the following: "The government is planning the reopening after the temporary self-isolation measures introduced to deal with the coronavirus emergency. At this stage, it is necessary to consider the consequences that each decision has in terms of protection (costs for the worsening) of health - number of infections- and protection (costs for the

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[8] These are students regularly enrolled at the 2nd and 3rd year of the different First Level Degrees, 1st year of the Second Level Degrees and all years of "Lauree a Ciclo Unico" offered by the University of Calabria, 61% of them are female and on average are 22 years old. 29% of them belong to the Department of Social Sciences, 20% to Engineering, 18% to Humanities and 33% to Sciences.

[9] The University of Calabria is a large public university located in the South of Italy. It has currently about 29,000 students enrolled in different Degree Courses and at different levels of the Italian University system. Since the 2001 reform, the Italian University system is organized into three main levels: First Level Degrees (3 years of legal duration), Second Level Degrees (2 further years) and Ph.D. Degrees. In order to gain a First Level Degree, students have to acquire a total of 180 credits. Students who have acquired a First Level Degree can undertake a Second Level Degree (acquiring 120 more credits). After having accomplished their Second Level Degree, students can apply to enroll for a Ph.D. However, in some degrees, such as Law and Architecture, the First and the Second Level Degrees are coupled together with a Degree (Lauree a Ciclo Unico) lasting 5 years.

[10] We have firstly divided students into two groups: those with an even matriculation number and those with an odd matriculation number. Then, within each group, we have randomly created two subgroups of equal dimension.

worsening) of the economic situation. If you were the head of the government, which strategy would you choose?". Respondents could choose from the following five alternatives: "I would consider extremely the protection (costs for the worsening) of health and not much the protection (costs for the worsening) of the economic situation"; "I would consider very much the protection (costs for the worsening) of health and a little bit the protection (costs for the worsening) of the economic situation"; "I would take into account enough the protection (costs for the worsening) of health and enough the protection (costs for the worsening) of the economic situation"; "I would consider a little bit the protection (costs for the worsening) of health and very much the protection (costs for the worsening) of the economic situation"; "I would consider not much the protection (costs for the worsening) of health and extremely the protection (costs for the worsening) of the economic situation".

Thus, we design four treatments in a between-subjects design. In the first treatment, *HealthProtection-EconomyCosts* (HP-EC hereafter), participants are framed the trade-off in terms of protection of health and costs for the worsening of the economic condition. In the second treatment, *HealthCosts-EconomyCosts* (HC-EC, hereafter), participants are framed the trade-off in terms of costs both for health and for the worsening of the economic condition. In the third treatment, *HealthProtection-EconomyProtection* (HP-EP, hereafter), both elements of the trade-off are framed in terms of protection while in the fourth treatment, *HealthCosts-EconomyProtection* (HC-EP, hereafter), the choice is between the costs for health and the protection of the economic situation.

In Table 1 we describe the question asking how individuals would balance health and economic concerns after the end of lockdown measures. We report the percentage of students choosing each option under the four different treatments. The HP-EC treatment shifts individual preferences toward policies focusing on health concerns, while under the HC-EP treatment, the option of equally considering both health and economic concerns records the highest percentage of preferences compared to all the other treatments.

Table 1: Relative frequencies of responses by treatments

	HC-EC	HP-EC	HP-EP	HC-EP
	A: costs for the worsening	**A**: protection	**A**: protection	**A**: costs for the worsening
	B: costs for the worsening	**B**: costs for the worsening	**B**: protection	**B**: protection
I would consider extremely the **A of** health and not much the **B** of the economic situation	7.76%	11.42%	7.74%	5.65%
I would consider very much the **A** of health and a little bit the **B** of the economic situation	26.39%	35.94%	26.77%	24.35%
I would consider enough the **A** of health and enough the **B** of the economic situation	63.86%	52.01%	64.16%	68.26%
I would consider a little bit the **A** of health and very much the **B** of the economic situation	1.11%	0.42%	0.66%	1.52%
I would consider not much the **A** of health and extremely the **B** of the economic situation	0.89%	0.21%	0.66%	0.22%

We use responses to the question on how individuals evaluate the health-wealth trade-off to create our dependent variable, *Trade-off*, which is an ordinal variable taking values ranging from 0 (for participants who selected "I would consider not much the protection (costs for the worsening) of health and extremely the protection (costs for the worsening) of the economic situation") to 4 (for participants who selected "I would consider extremely the protection (costs for the worsening) of health and not much the protection (costs for the worsening) of the economic situation"). Thus, the variable is increasing in terms of the importance given to health concerns and is on average 2.43 in the full sample. It takes on average the value of 2.4 in the treatment using costs for both elements of the trade-off or only for health, the value of about 2.6 when only health is expressed as protection and a lower value (2.3) when only economic concerns are expressed as protection.

In order to collect information on individuals' baseline preferences towards health and wealth, we posed the following question before introducing the treatment[11]: "Some research shows that the closure of non-essential activities was accompanied in Italy by a reduction of Rt (an indicator of the spread of the epidemic) from 8.2 to 0.4. However, each week of non-essential business closures seems to reduce a country's income and profits by 0.75%. If you were the head of government and the following scenarios were proposed to you for the next two months, which one would you choose: a) No closure, Rt = 8.2, Reduction of gross domestic product = 0%; b) Closes ¼ of non-essential activities, Rt = 6.15, Gross domestic product reduction = 1.5%; c) Half of non-essential activities close, Rt = 4.1, Gross domestic product reduction = 3%; d) All non-essential activities close, Rt = 0.4, Gross domestic product reduction = 6%".

The variable *BaselineTrade-off* takes values from 0 (for respondent choosing the option "a") to 3 (for respondents choosing the option "d"), increasing in the importance given to the health side of the trade-off. It allows us to have a baseline measure of individual preferences that helps to investigate whether treatment effects are homogeneous or dependent on ex-ante preferences. The average value of the variable in our sample is 2. Baseline and post-treatment preferences for the health-wealth trade-off are positively correlated (corr=0.18, p-value=0.000).

We have also obtained information on personal characteristics (gender, age, studies, family background, and residence), personality traits, well-being and intention to adhere to social distancing and precautionary behaviors. In Table 1, we report descriptive statistics of each variable both overall and separately by treatment groups. When looking at predetermined characteristics, we see that students are on average 22 years old and about 71% of them are female. As regards their family background, parents have studied on average for 12 years.

As an indicator of students' personality traits, we included in the survey a question asking students how much they see themselves as a person who is *Altruistic* (21% of the sample), *Trustworthy* (29%), *Extroverted* (6%), *Open to experience* (22%) and *Neurotic* (13%).[12]

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[11] See Appendix A for a translation of the survey questions.

[12] Students could choose among 7 alternatives: completely disagree; very much disagree; somewhat disagree; neither agree nor disagree; somewhat agree; very much agree; completely agree. The variables are dummies taking the value of 1 when the answer is "completely agree" and 0 otherwise.

We also collected information on Covid-19 health and economic implications. About 13% of the respondents state that they know someone (relatives, friends or even themselves) who tested positive for the diagnosis of Covid-19 and, for about 28% of students, both parents became unemployed because of the Covid-19 emergency. We also measure students' psychological conditions including in our survey two modules of the Patient Health Questionnaire (PHQ).[13] On the basis of students answers to a depression module[14] and an anxiety module, we build a depression and an anxiety severity scale, respectively. The depression severity scale takes values from 0 to 24 and has an average value of 9.4, while the anxiety severity scale[15] takes values from 0 to 20 with an average value of 13.20.

Finally, we asked individuals to report on a 0-100 range their willingness to comply with the following recommended behaviors: stay at home as much as possible; do not attend social events; wear face mask; stay at least two meters from other people; wash hands frequently; stay at home with symptoms of coronavirus; avoid hugs and handshakes. Using responses to these questions, we built two measures of compliance to these behaviors. First, we create a variable - named *Compliance PCA* - through a Principal Component Analysis of each of the seven questions on prescribed behaviors. As an additional alternative, we construct a "count" measure of compliance, summing up the values of the seven variables, and obtaining an indicator that ranges between 0 (when all the seven variables take the value of 0) and 700 (when all the seven variables take the value of 100). We adopt this approach as, in practice, the incidence of compliance is highly correlated across the different behaviors. For instance, the correlation between the intention to "Stay at home when sick" and "Wash your hands frequently" is equal to 0.557, p-value=0.000, while the correlation between "Avoid hugs and handshakes" and "Stay at least 2 meters from other people" is equal to 0.563, p-value=0.000. The average value of the variable is 648, it ranges from 641 in the HC-EP treatment to 655 in the HP-EC treatment.

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[13]PHQ is a diagnostic tool for mental health disorders used by health care professionals (Gilbody et al., 2007).

[14] We use an 8 items module rather than a standard PQH-9 module, as we decided to exclude the question inquiring suicide risk (the questions we have proposed to students are reported in appendix A). The depression severity scale is calculated by assigning scores of 0, 1, 2, and 3, to the response categories of not at all, several days, more than half the days, and nearly every day, respectively.

[15] We use a 5 items module inquiring student's feelings on the current situation (the questions we have proposed to students are reported in appendix A). Students were asked how much the statement (e.g. I'm nervous when I think to the current situation) corresponded to their actual feeling and could choose among 5 alternatives. The anxiety scale is calculated by assigning scores of 0, 1, 2, 3 and 4 to the response categories it doesn't match at all; it doesn't match; neither matches nor does not match; it matches; it matches completely, respectively.

Table 2. Descriptive Statistics

	All	HC-EC	HP-EC	HP-EP	HC-EP	F (P-value)
	(1)	(2)	(3)	(4)	(5)	(6)
Trade-off	2.4286	2.3902	2.5793	2.4027	2.3370	
	(0.6756)	(0.6853)	(0.7030)	(0.6704)	(0.6171)	
Baseline Trade-off	2.090	2.113	2.078	2.100	2.071	0.371
	(0.812)	(0.810)	(0.805)	(0.821)	(0.812)	(0.5423)
Predetermined characteristics and background						
Female	0.7086	0.7051	0.7040	0.7212	0.7043	0.2605
	(0.4545)	(0.4565)	(0.4570)	(0.4489)	(0.4568)	(0.6098)
Age	22.3061	22.2927	22.4524	22.2788	22.1957	0.3852
	(2.3514)	(2.2878)	(2.0591)	(2.2131)	(2.7867)	(0.5349)
Parents' Education	11.7928	12.0477	11.7230	11.6637	11.7413	2.6177
	(3.3168)	(3.0079)	(3.4823)	(3.2946)	(3.4479)	(0.1058)
People/mq	0.0377	0.0384	0.0381	0.0379	0.0362	0.5039
	(0.0228)	(0.0236)	(0.0223)	(0.0266)	(0.0179)	(0.4779)
Sciences	0.3224	0.3060	0.2558	0.2434	0.4848	0.2274
	(0.4675)	(0.4613)	(0.4368)	(0.4296)	(0.5003)	(0.6335)
Humanities	0.1983	0.2239	0.2410	0.2743	0.0543	0.2252
	(0.3988)	(0.4173)	(0.4282)	(0.4467)	(0.2269)	(0.6352)
Engineering	0.1781	0.1885	0.2241	0.1881	0.1109	2.1357
	(0.3827)	(0.3915)	(0.4174)	(0.3912)	(0.3143)	(0.1441)
Social Sciences	0.3012	0.2816	0.2791	0.2942	0.35	1.3112
	(0.4589)	(0.4503)	(0.4490)	(0.4562)	(0.4775)	(0.2523)
Personality traits						
Altruist	0.2146	0.2217	0.2051	0.2367	0.1957	
	(0.4107)	(04159)	(0.4042)	(0.4255)	(0.3971)	
Trustworthy	0.2876	0.2860	0.3044	0.2566	0.3022	
	(0.4528)	(0.4524)	(0.4607)	(0.4373)	(0.4597)	
Extroverted	0.0561	0.0466	0.0550	0.0575	0.0652	
	(0.2302)	(0.2109)	(0.2282)	(0.2331)	(0.2472)	
Open to new experiences	0.2228	0.2395	0.2030	0.2677	0.1826	
	(0.4162)	(0.4272)	(0.4026)	(0.4432)	(0.3868)	
Neurotic	0.1313	0.1109	0.1416	0.1482	0.1239	
	(0.3378)	(0.3143)	(0.3491)	(0.3557)	(0.3298)	
Covid-19 health and economic implications						
Experienced Covid-19	0.1296	0.1441	0.1290	0.1261	0.1196	0.8055
	(0.3360)	(0.3516)	(0.3355)	(0.3323)	(0.3248)	(0.3696)
Parents Unemployed Covid-19	0.2761	0.2550	0.2537	0.3009	0.2957	3.6947
	(0.4472)	(0.4363)	(0.4356)	(0.4592)	(0.4568)	(0.0547)
Depression severity index	9.408	9.226	9.021	9.559	9.841	
	(5.461)	(5.178)	(5.447)	(5.575)	(5.612)	
Anxiety severity index	13.189	13.208	13.211	13.237	13.097	
	(3.459)	(3.441)	(3.603)	(3.282)	(3.507)	
Compliance with prescribed behaviors						
Compliance PCA	0.067	0 .073	0.211	0.050	-0.075	
	(1.692)	(1.559)	(1.296)	(2.023)	(1.803)	
Compliance	648.507	648.213	655.023	649.020	641.462	
	(70.259)	(67.546)	(55.812)	(80.132)	(75.113)	
Observations	1,836	451	473	452	460	

Notes: In columns (1) to (5) we report standard deviations in parentheses. In column (6) we report in parentheses *p*-values for the test of equality of means across treatments.

To investigate the effects that the four treatments produce on individual outcomes we need four comparable groups. The last column of Table 2 reports p-values of tests of equality of variables' means among treatments. Treatment groups are evenly balanced on a large number of covariates (with the exclusion of Parents

Unemployed Covid-19) and data regarding predetermined characteristics show that we are unable to reject the hypothesis that the randomization was successful in creating comparable treatment groups in respect of observable characteristics in the subsample of students submitting their responses to the survey questions.[16] Also, if we compare predetermined characteristics of respondents with those of the average student population we find that our sample is quite representative of the student population along the dimensions of age and field of study while, due to a higher response rate, women are slightly over-represented (61% of students included in the survey are female).

3. Communication and preferences for health and wealth: Main Results

In this section we carry out an econometric analysis to investigate whether being assigned to the four different framings adopted in our experiment induces individuals to balance differently health and economic concerns.

We estimate several specifications of the following simple model:

$$[1] \; HealthCenteredPolicy_i = \beta_0 + \beta_1(HP-EC)_i + \beta_2(HC-EP)_i + \beta_3(HP-EP)_i + \beta_4 X_i + \beta_5 F_i + $$
$$+\beta_6 BaselineTradeoff_i + \beta_7 W_i + \beta_8 Z_i + u_i$$

where the vector X_i includes individual pre-determined characteristics (gender, age, field of study, etc.), F_i includes family background variables (parents' education, etc.), W_i includes controls for Covid-19 health and economic implications (parents' employment, experience with Covid-19, psychological conditions), Z_i is a set of variables measuring current personality traits, and u_i is the error term.

In this setting, β_1 is the difference between HP-EC and HC-EC (that is the treatment effect of framing health in terms of protection instead of costs) in the propensity to favor policies that give greater weight to health concerns arising from the spread of Covid-19. Positive values of β_1 suggest that, in the management of the reopening after the lockdown measures, communicating the trade-off using for health a positive framing which focuses on protective strategies - instead of a negative framing based on costs - increases individuals' concerns for the health consequences of the pandemic. A similar interpretation holds for β_2 and β_3 that represent

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[16] We have also tested the equality of variables means for each possible pair of treatments. We find that treatments are always equally balanced in terms of age and gender but sometimes they present differences in the distribution of field of study. For this reason, in our estimates we control for dummies for field of study.

the effect induced by the other two treatments, HC-EP and HP-EP, respectively, with respect to the framing HC-EC.

Our hypotheses are the following:

- H1: $\beta_1 > 0$, that is, the use of a positive framing (protection) for health induces individuals to associate a greater weight to health in the trade-off, being both more risk averse on this domain and more inclined to bear higher economic costs as they are seen as a payment needed in order to protect health;

- H2: $\beta_2 < 0$, that is, the use of a positive framing (protection) for economic concerns increases the weight of economic concerns in the trade-off for the same reasons as above;

- H3: $\beta_3 \geq 0$, that is when both elements of the trade-off are framed in terms of protection; either they should carry the same weight or, given the strong health concerns under a pandemic, the protection of health may carry more weight.

In Table 3 we report estimation results of several specifications of model [1]. We estimate an Ordered Probit Model to study the effect of the assigned treatment condition on the probability of students giving greater consideration to health concerns in policy decisions. Since the dependent variable increases with the importance associated with health concerns, positive coefficients suggest the likelihood of preferences being more shifted toward health concerns. In all the regressions, standard errors (corrected for heteroscedasticity) are reported in parentheses.

As shown in column (1), where we do not include controls, we find that, compared with the HC-EC treatment, the HP-EC framing induces individuals to choose a policy that gives greater consideration to health issues. Thus, our data confirm hypothesis H1: when the trade-off is communicated as health protection versus wealth costs, instead of framing both health and wealth as costs, respondents perceive the worsening of the economic situation as a cost allowing for protection against the worsening of health, instead of as an uncompensated loss, and are therefore more willing to sustain it. The shift in preferences that favor policies that mainly focus on health issues produced by the HP-EC treatment, is statistically significant also when compared with the other different types of framing used in our experiment. As regards hypothesis H2, we find evidence for a negative effect of the positive framing associated with economic concerns on the preference for health-oriented policies, but the estimated coefficient is not statistically significant. Finally, when looking at

the HP-EP treatment (H3), we find a positive but not statistically significant coefficient. This would suggest that framing both elements of the trade-off in terms of protection is the same as using the framing "costs" and, even under a pandemic, the protection of health does not carry significantly more weight when joined with the protection of the economic situation.

Table 3. The Impact of communication on preferences for policies aimed at managing the Covid-19 crisis. Ordered Probit Estimates

| | *Trade-off* | | | | | |
	(1)	(2)	(3)	(4)	(5)	(6)
HP-EC	0.3241***	0.3390***	0.3445***	0.3617***	0.3630***	0.3660***
	(0.0771)	(0.0772)	(0.0780)	(0.0787)	(0.0786)	(0.0788)
HC-EP	0.0251	0.0381	0.0378	0.0442	0.0611	0.0572
	(0.0799)	(0.0799)	(0.0804)	(0.0804)	(0.0808)	(0.0808)
HP-EP	-0.0998	-0.1191	-0.1152	-0.1221	-0.1177	-0.1140
	(0.0791)	(0.0808)	(0.0814)	(0.0817)	(0.0820)	(0.0821)
Female		-0.0200	-0.0204	-0.0225*	-0.0242*	-0.0246*
		(0.0131)	(0.0132)	(0.0130)	(0.0130)	(0.0129)
Age		-0.0125	-0.0114	0.0012	-0.0885	-0.0913
		(0.0667)	(0.0666)	(0.0667)	(0.0724)	(0.0722)
Sciences		0.2502***	0.2461***	0.2122***	0.2159***	0.2172***
		(0.0690)	(0.0694)	(0.0705)	(0.0713)	(0.0715)
Humanities		0.1125	0.1118	0.0767	0.0719	0.0654
		(0.0844)	(0.0845)	(0.0852)	(0.0859)	(0.0859)
Engineering		0.0725	0.0615	0.0100	0.0257	0.0300
		(0.0870)	(0.0880)	(0.0883)	(0.0881)	(0.0885)
Parents' Education			0.0211**	0.0219***	0.0205**	0.0206**
			(0.0084)	(0.0085)	(0.0086)	(0.0086)
People/mq			2.8744**	2.8106**	2.8528**	2.7569**
			(1.3024)	(1.2939)	(1.3067)	(1.3109)
Baseline Trade-off				0.2644***	0.2512***	0.2508***
				(0.0372)	(0.0370)	(0.0369)
Parents Unemployed Covid-19					-0.1284**	-0.1267**
					(0.0632)	(0.0634)
Experienced Covid-19					0.0464	0.0479
					(0.0848)	(0.0850)
Anxiety severity scale					0.0423***	0.0419***
					(0.0104)	(0.0104)
Depression severity scale					-0.0079	-0.0100
					(0.0060)	(0.0061)
Altruist						0.1507*
						(0.0796)
Trustworthy						-0.0589
						(0.0670)
Extroverted						0.0464
						(0.1285)
Open new experiences						0.0111
						(0.0775)
Neurotic						0.0164
						(0.0930)
Province of Residence FE	NO	NO	YES	YES	YES	YES
Observations	1836	1836	1836	1836	1836	1836

Notes: Standard errors (corrected for heteroscedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

These results remain qualitatively unchanged when we add controls for age, gender and field of study (column 2) and when we also add controls for family background and province of residence fixed effects (column 3). In column (4) we include among controls our measure *BaselineTrade-off*, which is positively correlated with preferences for a health-centered policy, but does not affect the influence produced by our treatment conditions. No relevant changes are found also when we add, among regressors, proxies for individual exposure to the Covid-19 emergency both in terms of health and economic implications (column 5) and when we control for individual personality traits (column 6).

The impact of the HP-EC treatment is sizeable. When looking at average marginal effects for the specification including all the control variables (column 6) we find that when the trade-off is expressed in terms of protection of health and costs for the worsening of the economic situation - instead of in terms of costs for both health and the economy - individuals are about 0.45% less likely to choose the policy giving the greatest weight to the economic situation; about 0.78% less likely to choose the policy considering a little bit health and very much the economic situation; 11.8% less likely to choose the intermediate policy; 7.7% more likely to choose the policy considering very much health and a little bit the economic situation and about 5.2% more likely to choose the policy that gives greatest weight to health concerns.

As regards control variables, we find that the field of study reveals different preferences and that students enrolled in scientific disciplines tend to prioritize health concerns compared with students enrolled in economics and social sciences and engineering. There is also an important difference in terms of socio-economic background; students who have more highly educated parents and who live in larger houses show a preference for policies that tend to favor health protection. Since both parental education and floor space per person are usually associated with the economic conditions of the family, the result shows that those who come from contexts of greater economic distress tend to give greater weight to the economic costs of the pandemic.[17] This is also confirmed by the fact that students with parents who lost their jobs due to the emergency tend to express themselves more favorably towards a compromise that takes due account of the economic costs of the crisis. On the other hand, students who are particularly anxious, due to the Covid-19 emergency, are more favorable to policies more focused on health issues. Finally, those who describe themselves as altruistic also tend to prefer health-centered policies.

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[17] For heterogeneous impact of the pandemic for different categories of workers see for instance Montenovo et al. (2020).

To check the robustness of our results, we have also created, as an outcome variable, a dummy taking the value of 1 for individuals who report preferences for policies that give 'very less' or 'less' relevance to the economic costs of the crisis and 0 otherwise. Probit estimates are qualitatively very similar to those discussed above. The only difference concerns the HC-EP coefficient that now is more precisely estimated but still typically not statistically significant at conventional levels. Results are not reported but are available upon request.

4. Heterogeneous impact of framing

In the previous sections we have seen that a simple communication strategy, that positively frames the health side of the health-wealth trade-off arising from the current health emergency, impacts on individual preferences towards the trade-off. Nonetheless, communication takes place in different contexts and is directed to different audiences, who might be more or less reactive to how messages are framed. Then, in this section, we investigate if individual characteristics, such as gender, economic and social background, personality traits, experiences and beliefs, can amplify or nullify the impact of framing.

With this aim, we analyze whether our treatments have produced heterogeneous effects across the three sets of controls that we have considered in the previous analysis (predetermined characteristics and background; personality traits; Covid-19 health and economic implications) and whether the impact is related to individual baseline preferences. This would suggest in which circumstances framing can be effectively used to try to build up consensus towards certain types of policies. For each control that we consider, we report bar graphs showing the average level of our indicator *Trade-off* for each of our treatments separately by category and 90% confidence levels (the results of the corresponding econometric analysis are shown in Appendix B of the paper).

In Figure 1 we look at two predetermined characteristics and an indicator of family background. Figure 1 (a) focuses on gender and reports mean values of *Trade-off* for each treatment, separately for men and woman. We can see that for both genders the variable *Trade-off* has the highest mean value when health is associated with a positive framing; however, females show a large and statistically significant shift in preferences over the health-wealth trade-off towards health-oriented policies when health is framed using the positive word "protection". Using the positive framing only for economic concerns leads to more wealth-

oriented preferences; however, the impact is not heterogeneous according to gender nor is statistically different from the HC-EC treatment. Thus, the positive effect of the HP-EC treatment on students' preferences over policies that mainly focus on health concerns is mainly due to females' reactions.[18] This evidence of females' higher sensibility to the positive framing for health is in line with Galasso et al. (2020) who find that on average females are more likely to perceive Covid-19 as a very serious health problem and to agree and comply with precautionary behaviors.

In Figure 1 (b) we look at *Age* and split the sample into students with an age higher than (or equal to) 22 (the average) and students at less than 22 years old. Again, for both categories it emerges that there is a positive effect of the HP-EC treatment; nonetheless, the effect seems to be driven by younger students. Finally, in Figure 1 (c) we split our sample according to parents' education (above and below the median). While the positive effect of the HP-EC treatment seems to be almost equal between the two categories, what emerges is a differentiated effect for the HP-EP treatment. Compared with the HC-EC treatments, students with more highly educated parents when exposed to HP-EP treatment react by significantly increasing their favor towards policies focusing on health concerns. The effects are even more interesting if compared with the shift in the opposite direction experienced by students coming from lesser educated backgrounds (for these students *Trade-off* is on average lower – thus preferences are towards more economic oriented policies – in the HP-EP treatment compared with the HC-EC treatment).[19]

Figure 1: Predetermined characteristics and background
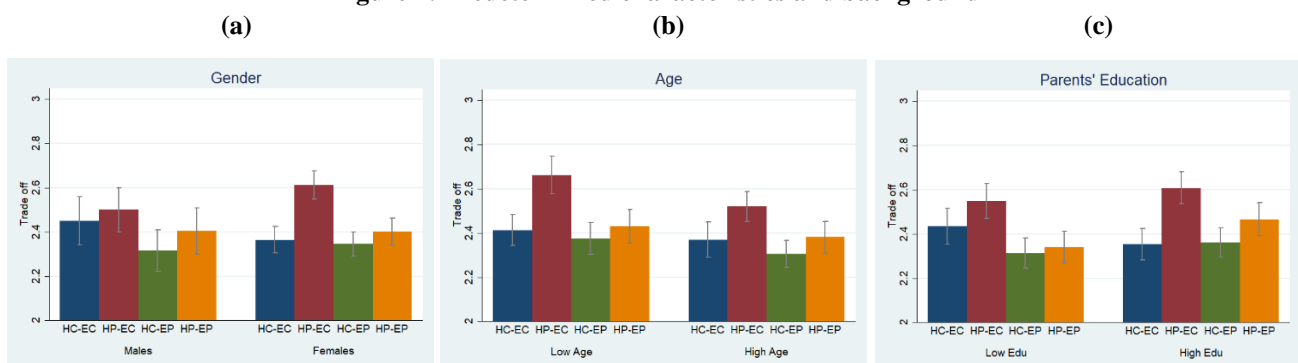
In Figure 2 we investigate whether individuals' reactions to how communication is framed are related to their self-reported personality traits. We here consider only altruism, trustworthiness and extroversion because

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[18] See Appendix B for econometric results.
[19] Heterogeneity across the other dimensions, such as the number of squared meters available for each person in the house, does not produce any significant effect.

individuals claiming to be opened to experience and neurotic have preferences very close to those not self-defining likewise. Figure 2 (a) looks at altruistic individuals who, according to estimates shown in Table 3, tend to prefer policies that focus on health issues. The graph clearly shows a significantly stronger effect of the HP-EC treatment on these individuals compared to others who did not see themselves as particularly altruistic, while no significant differences emerge for the other treatments. Likewise, when looking at *Trustworthy* individuals (Figure 2 (b)) we find that they report preferences significantly shifted towards health-oriented policies (higher values of *Trade*-off) in the HP-EC treatment compared with the HC-EC treatment. Compared with other individuals, they also seem to favor more health in all treatments except for the HC-EC treatment. Finally, when looking at extroversion in Figure 2 (c), it emerges that individuals who do not consider themselves as extrovert are more influenced by the HC-EP treatment (lower values of *Trade-off*) than their extrovert counterparts and are, instead, more prone to health-oriented policies when the positive framing is used for both elements of the trade-off.

Figure 2: Personality traits

| **(a)**	**(b)**	**(c)**
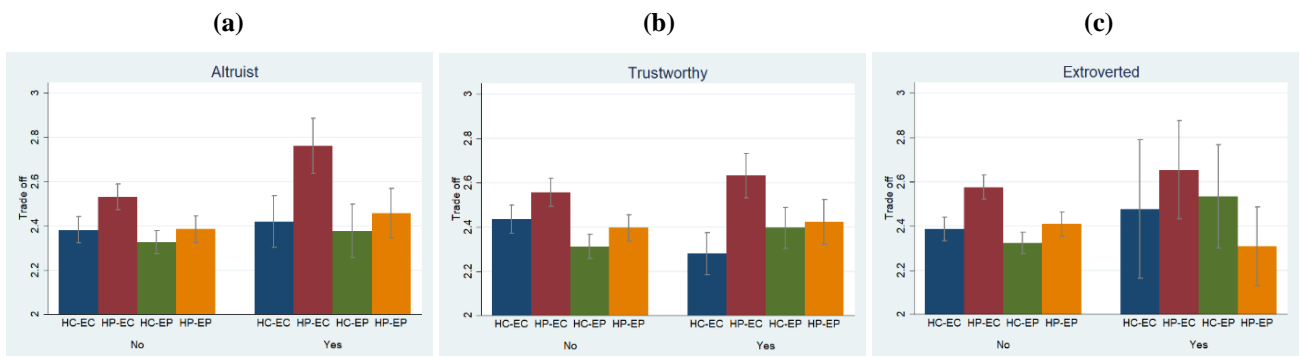
We have also examined the role of individual exposure to the Covid-19 emergency both in terms of health and economic implications. Firstly, we have considered whether individuals more directly exposed to Covid-19, because relatives or friends tested positive to the virus, are less or more influenced by framing. Figure 3 (a) shows that preferences of exposed individuals are overall more shifted towards health policies. In particular, this is the case when the positive framing is used for economic concerns (HC-EP): while individuals who have not closely experienced the epidemic seem to have preferences more in favor of policies that tend to limit the impact of the crisis on the economy, those who more closely experienced the epidemic are still more in favor of health-oriented policies. Then, to consider personal exposure to the economic crisis, we have split the sample

according to whether or not students' parents have lost their jobs due to the pandemic. While showing similar preferences in the HP-EC treatment, students who have been under economic distress because one of their parents has lost their job due to the economic crisis seem more oriented towards policies fostering solutions to the economic crisis in all other treatments.

Additionally, as the way in which individuals react to the communication messages they receive also depends on their psychological conditions, in Figure 3 (c) and (d) we split our sample considering the depression and anxiety severity scales we have described in Section 3. The figures confirm the effect of a positive framing for health concerns. In particular, we find that for people who feel more depressed, the increase in preferences for more health-oriented policies when the trade-off is expressed in terms of protection of health and costs for the worsening of the economic situation - instead of in terms of costs for both health and the economy - is almost twice as large as the effect found for individuals in better psychological conditions.

Figure 3: Covid-19 health and economic implications
(a)   **(b)**

(c)   **(d)**
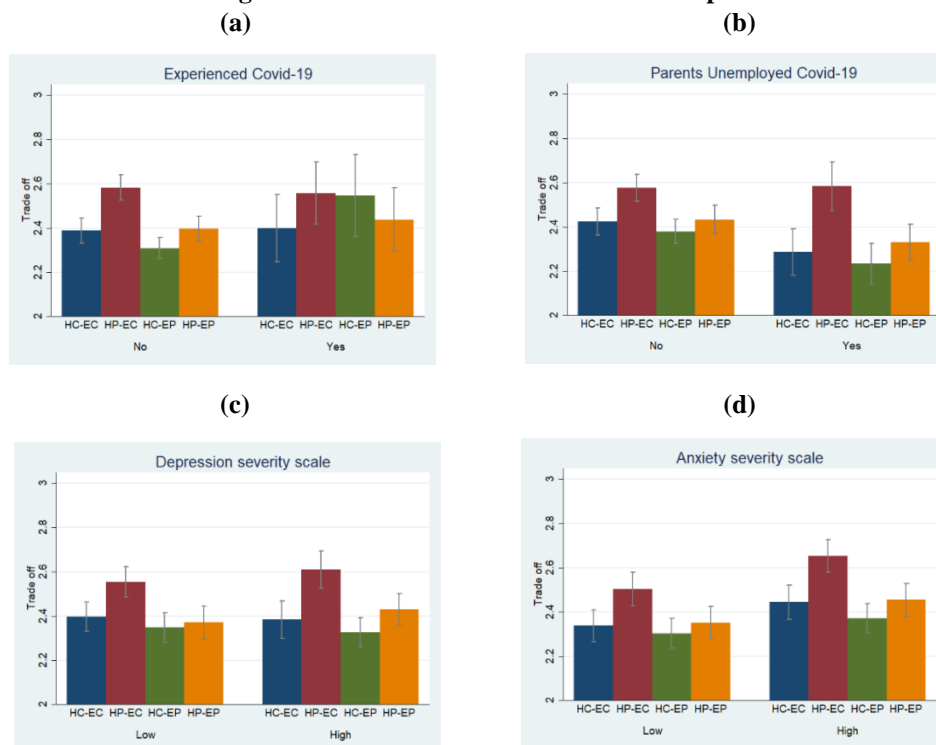
As a last heterogeneous effect analysis, we also look at whether the framing has a differential effect among individuals with different baseline preferences over the health-wealth trade-off. Figure 4 compares the average value of *Trade-off* for individuals who, before the treatment, indicated to having economic oriented, middle or health-oriented preferences, respectively. The graph shows that baseline and ex-post preferences are positively

correlated; in fact, the height of the bars increases when moving to middle and health-oriented preferences. When the positive framing is used for the health side of the trade-off, even those with ex-ante more economic oriented preferences shift towards policies that assign higher value to health and indeed these individuals are those experiencing the highest treatment effect as compared with the HC-EC treatment. We do not find a specular effect when using the positive framing for the economic side of the trade-off.

Figure 4: Baseline preferences
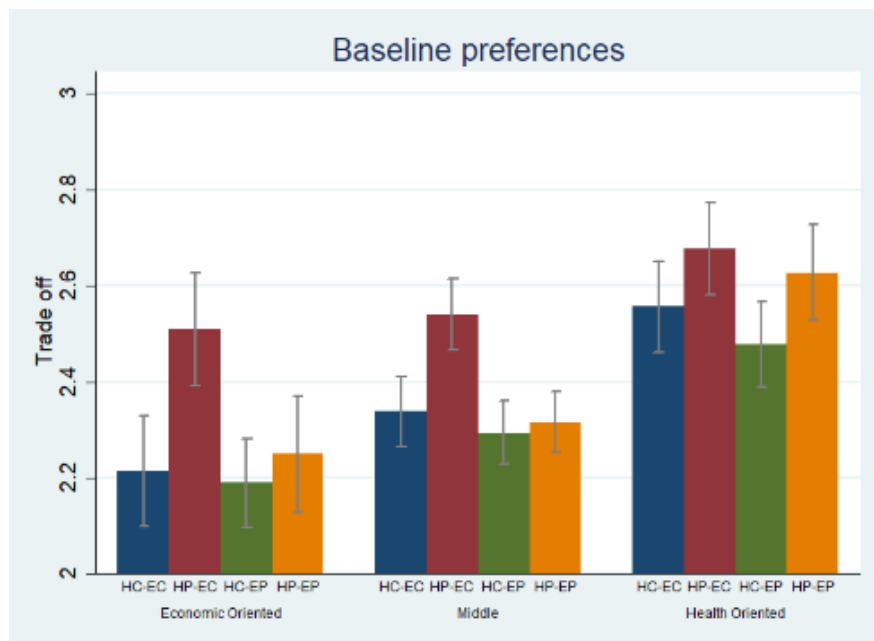
All in all, our analysis shows that, a simple and zero cost communication strategy that associates a different framing to the two sides of the trade-off has a widespread effect.

5. Communication and compliance with prescribed behaviors

Our analysis so far shows that communication style affects individual preferences over the health-wealth trade-off of Covid-19 related policies. In this section, we take a further step by looking at how preferences over the trade-off correlates with intentions to adhere to prescribed behaviors that have been suggested as useful tools to limit the spread of the epidemic (i.e. wash hands; avoid touching eyes, nose, mouth; stay at least two meters from other persons, stay at home with symptoms of coronavirus). These are measured by the two proxies described in Section 2, *Compliance PCA* and *Compliance*.

Table 4. Preferences for health centered policies (Trade-off) and intention to adhere to prescribed behaviors. OLS Estimates

	Compliance PCA (1)	Compliance (2)	Compliance PCA (3)	Compliance (4)	Compliance PCA (5)	Compliance (6)
Trade-off	0.2873***	13.7449***	0.2364***	11.4819***	0.2062***	10.2431***
	(0.0736)	(2.9359)	(0.0700)	(2.7974)	(0.0680)	(2.7020)
Female			0.5198***	22.0261***	0.4256***	18.5197***
			(0.0865)	(3.6371)	(0.0981)	(4.0564)
Age			-0.0208	-0.7726	-0.0217	-0.7953
			(0.0222)	(0.8656)	(0.0220)	(0.8540)
Science			0.0252	1.9127	0.0546	3.1757
			(0.1068)	(4.4096)	(0.1050)	(4.3413)
Humanities			0.1615*	4.7624	0.1735*	5.2562
			(0.0967)	(4.2380)	(0.0971)	(4.2545)
Engineering			0.0939	5.9801	0.1435	8.2332*
			(0.1177)	(4.8936)	(0.1154)	(4.7922)
Parents' Education			-0.0021	-0.1973	0.0005	-0.0999
			(0.0131)	(0.5466)	(0.0133)	(0.5541)
People/mq			0.7468	45.7110	0.8292	50.3332
			(2.1032)	(82.9551)	(2.1330)	(83.4950)
Baseline Trade-off			0.1959***	8.8720***	0.1805***	8.1802***
			(0.0549)	(2.2563)	(0.0553)	(2.2678)
Parents Unemployed Covid-19					-0.0384	-2.4223
					(0.0905)	(3.7195)
Experienced Covid-19					-0.0156	-0.3317
					(0.1192)	(5.0040)
Anxiety severity scale					0.0575***	2.2620***
					(0.0131)	(0.5516)
Depression severity scale					-0.0236***	-1.0864***
					(0.0090)	(0.3651)
Altruist					0.0448	2.1857
					(0.1088)	(4.4941)
Trustworthy					0.2800***	13.1387***
					(0.0808)	(3.4611)
Extroverted					-0.2278	-9.5914
					(0.1994)	(8.3191)
Open new experiences					-0.1387	-8.1236*
					(0.1019)	(4.3644)
Neurotic					-0.0150	0.8255
					(0.1283)	(5.2747)
Prov. of Residence FE	NO	NO	YES	YES	YES	YES
Observations	1836	1836	1836	1836	1836	1836

Notes: Standard errors (corrected for heteroscedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

In Table 4 we report OLS estimation results investigating the relationship between intention to adhere to prescribed behaviors and preferences for health centered policies (*Trade-off*). In odd columns we consider as the outcome variable *Compliance PCA*, while in even ones we use *Compliance*. As shown in columns (1) and (2), without controls, we find that *Trade-off* is positively and significantly correlated with both measures of compliance. The same results hold true when we add among the regressors individual and family

characteristics and our measure of baseline preferences (columns 3 and 4) and the full set of controls (columns 5 and 6). As regards control variables, consistently with what found by other studies, we find that women are more likely to follow precautionary behaviors. A positive correlation is found also for *Baseline trade-off*, *Parents' education*, *Anxiety severity index*, *Trustworthy*.

The positive correlation between *Trade-off* and individual compliance shown in Table 4 indicates that individuals with preferences for the health-centered policies are generally more likely to have an intention to adhere with prescribed behaviors. However, this does not imply causation since it is possible that unobserved factors associated with both the perceived trade-off and compliance cause a spurious correlation between these two variables. Thus, in order to gain a better understanding of the extent to which health-wealth concerns causally affect adherence with behaviors, we follow Settele and Shupe (2020) and exploit the exogenous variation in the perceived trade-off induced by the framing experiment in an Instrumental Variable (IV) two-stage regression framework. More precisely, we take advantage of the fact that assignment to the treatment is random. This serves as an exogenous instrument predicting preferences for health-centered policies in the first-stage but uncorrelated with compliance. In order to have a strong instrument we use the assignment to the framing "Health Protection- Economic Costs (HP-EC)" since this is found to be highly associated with perceived trade-off, as shown in Section 4.

Results of this analysis are reported in Table 5. We estimate the same specifications reported in Table 4. First-stage regression results (Panel A) confirms a strong and significant effect of the treatment HP-EC on the perceived trade-off. First stage F-test statistics is well above the common threshold of 10 used to detect weak instruments. Importantly, second stage regressions (Panel B) show a positive and statistically significant effect of perceived trade-off on both measures of compliance. This further confirms that the type of communication we have analyzed in this paper affects intentions to adhere to prescribed behaviors through a switch in preferences over the health-wealth trade-off.

Table 5. Intention to adhere to prescribed behaviors and health-wealth preferences. IV Estimates

	Panel A First Stage					
	Trade-off	Trade-off	Trade-off	Trade-off	Trade-off	Trade-off
HP-EC	0.203***	0.203***	0.214***	0.214***	0.211***	0.211***
	(0.036)	(0.036)	(0.035)	(0.035)	(0.035)	(0.035)
F-stat	32.21	32.21	33.17	33.17	32.17	32.17
	Panel B Second Stage					
	(1)	(2)	(3)	(4)	(5)	(6)
	Compliance PCA	Compliance	Compliance PCA	Compliance	Compliance PCA	Compliance
$\widehat{Trade-off}$	0.9583**	43.2553***	0.9310**	42.2937***	0.8211**	36.8269**
	(0.3926)	(16.6738)	(0.3717)	(15.8405)	(0.3663)	(15.6462)
Individual char.	NO	NO	YES	YES	YES	YES
Field of study FE	NO	NO	YES	YES	YES	YES
Family background	NO	NO	YES	YES	YES	YES
Prov. of Res. FE	NO	NO	YES	YES	YES	YES
Baseline Trade-off	NO	NO	YES	YES	YES	YES
Covid-19 impl.	NO	NO	NO	NO	YES	YES
Personality traits	NO	NO	NO	NO	YES	YES
Observations	1836	1836	1836	1836	1836	1836

Notes: Standard errors (corrected for heteroscedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

6. Conclusions

The management of the health emergency by Covid-19 represents a great public challenge that requires a massive effort in terms of individual cooperation in order to limit the diffusion of the epidemic. The role of public communication, especially in the absence of financial incentives, has been recognized by several studies as decisive in order to ensure individual compliance with recommended behaviors. In particular, a key issue to be addressed concerns the management of the trade-off between public health and wealth.

In this paper, we investigate how people balance this trade-off during the pandemic and how the communication strategy over this trade-off affects their preferences for policies aimed at managing the restart of economic and social activities, and, ultimately their intention to adhere to prescribed behaviors. We analyze this issue in Italy - one of the country most affected by the outbreak - using a field experiment involving around 2000 students enrolled in a large university in the South of Italy. Data are collected through a survey administered during the period 20th April - 25th April, i.e. before the end of the lockdown period. We compare a positive framing which focuses on protective strategies ("protection") with a negative framing which focuses on potential losses ("costs").

We find that a policy focusing on the protection of health and the costs for the worsening of the economic situation induces individuals to give greater relevance to health issues than when the trade-off is expressed in terms of costs for both health and wealth. The effect is sizeable, highly effective across different typologies of audiences, especially females, and associated with a higher intention to adhere to social distancing and precautionary behaviors. To give an idea of the magnitude, we find that while 47.36% of students responded that they would consider 'extremely' or 'very much' health when framed as protection versus economic costs, this share is 34.15% in the group having both health and economic issues framed as costs.

These results have important policy implications. First, they suggest that the communication strategy during an emergency - such as that deriving from the diffusion of the Covid-19 virus - plays a crucial role and that a positive framing that focuses on the "protection" of the health conditions is likely to significantly shape individual preferences over the health dimension of the crisis. If we assume no significant deviations from stated *vs* revealed preferences, we may speculate that such a communication is likely to increase political consensus and may represent a costless strategy to ensure higher compliance with recommendations in the phases following the end of lockdown measures. Second, being able to shape individual preferences over the health-wealth trade-off, especially with cost-effective measures, is even more important when considering that such preferences affect individual decision to comply with behaviors that have been strongly recommended by doctors and specialists since the onset of the emergency in order to limit the spread of the virus. Instrumenting individual preferences for the trade-off with the random assignment to the treatment introducing a positive framing for health and a negative framing for wealth, we provide causal evidence of a positive effect of health-oriented preferences on compliance. Thus, an effective communication strategy may be a way to induce an otherwise non-incentivized active role in the defeat of the epidemic. Third, our paper shows that characteristics such as personal attitudes, specific knowledge (i.e. the field of study) and state-dependent conditions affect preferences for the health-wealth trade-off during the pandemic, regardless of the framing of the communication. In particular, the differences due to socio-economic background may pose important policy concerns. Political debate in many countries is nowadays dominated by very polarized positions over the priorities to be given to the management of the reopening phase. Our paper suggests that these differences might be explained by the asymmetric economic consequences of the pandemic. One implication of this result

is that financial help towards people who faced large economic shocks may also be supported as a way to strengthen social cohesion and preferences alignment over the management of the pandemic. Lastly, we find an interesting gender differential in the impact of framing on preferences over the trade-off that might deserve further exploration. Despite the fact that the health consequences of the Covid-19 virus seem to be less pronounced among females, we find that women are significantly more affected by a positive framing focusing on the protection of the health conditions. Whether this depends on gender specific attitudes or on the role model of the male breadwinner might be a nice area of future research.

References

Acemoglu, D., Chernozhukov,V., Werning,I, Whinston, M.D. (2020), A Multi-Risk SIR Model with Optimally Targeted Lockdown, *NBER Working Paper No. 27102.*

Allcott, A., Boxell, L., Conway, J. et al. (2020), "Economic and Health Impacts of Social Distancing Policies During the Coronavirus Pandemic," *SSRN Working Paper* No. 3610422,

Alvarez, F., Argente, D., Lippi, F. (2020), A Simple Planning Problem for Covid-19 Lockdown, *NBER Working Paper* No. 26981.

Bank of Italy (2020), *Bollettino Economico 2 2020*, available at:
https://www.bancaditalia.it/pubblicazioni/bollettino-economico/2020-2/boleco-2-2020.pdf

Barba Navaretti, G., Calzolari, G., Dossena, A., Lanza, A., Pozzolo, A., (2020), In and out lockdowns: Identifying the centrality of economic activities, *CEPR Covid Economics: Vetted and Real-Time Papers* 17, 13 May.

Barro, R. J., (2020), Non-Pharmaceutical Interventions and Mortality in U.S. Cities during the Great Influenza Pandemic, 1918-1919, *NBER Working Paper* No. 27049

Bertoni, M., Corazzini, L., Robone, S. (2020), The Good Outcome of Bad News: A Field Experiment on Formatting Breast Cancer Screening Invitation Letters, *American Journal of Health Economics,* 6, 3: 372-409.

Boettcher, W., (2004), The prospects for prospect theory: an empirical evaluation of international relations applications of framing and loss aversion. *Polit. Psychol.* 25, 331–362.

Briscese, G., N. Lacetera, M. Macis, and M. Tonin (2020), Compliance with Covid-19 social distancing measures in Italy: the role of expectations and duration, *NBER Working Paper* No. 26916.

Buckel, K. (2013), Do words matter? The impact of communication on the PIIGS' CDS and bond yield spreads during Europe's sovereign debt crisis, *European Journal of Political Economy*, 32, 412-431.

Centro Studi Confindustria (2020), *The Italian economic outlook 2020-2021. How to help the resilience of the economy and to boost it after the crisis?* available at: https://www.confindustria.it/wcm/connect/01f1ad4b-d609-4728-b975-9e2d4a184e01/Italian+economic+outlook+2020_2021_Summary+and+main+conclusions_310320_Confind ustria.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-01f1ad4b-d609-4728-b975-9e2d4a184e01-n4NCcZg

Chong, D., Druckman, J.N., (2007), Framing public opinion in competitive democracies. *Am. Polit. Sci. Rev.* 101, 637–655.

Davis, M. A., Bobko, P. (1986), Contextual effects on escalation processes in public sector decision making. *Organizational Behavior and Human Decision Processes*, 37(1), 121–138.

Demoskopika (2019), *La performance sanitaria. Indice di misurazione e valutazione dei sistemi sanitari regionali Report 2019.*Available at: https://www.quotidianosanita.it/allegati/allegato8783063.pdf

Dybowski T. P., Adämmer P. (2018), The economic effects of U.S. presidential tax communication: Evidence from a correlated topic model, *European Journal of Political Economy*, DOI: 10.1016/j.ejpoleco.2018.05.001

Eichenbaum, M., Rebelo, S., Trabandt, M. (2020), The Macroeconomics of Epidemics, *Centre for Economic Policy Research, Discussion Paper* No. 14520.

Friedson AI., McNichols D., Sabia JJ., Dave D., (2020). Did California's shelter-in-place order work? early coronavirus-related public health effects. *NBER Working Paper* No. 26992.

Galasso, V., Pons, V., Profeta, P., Becher, M., Brouard, S., & Foucault, M. (2020). Gender differences in COVID-19 attitudes and behavior: Panel evidence from eight countries. *Proceedings of the National Academy of Sciences*, 117(44), 27285-27291.

Gibson, J., Xiaojin, S., (2020), Understanding the Economic Impact of COVID-19 Stay-at-Home Orders: A Synthetic Control Analysis (May 14, 2020). Available at SSRN: https://ssrn.com/abstract=3601108

Gilbody S., MRCPsych M., Richards D., Brealey S., Hewitt C. (2007). Screening for Depression in Medical Settings with the Patient Health Questionnaire (PHQ): A Diagnostic Meta-Analysis, *Journal General Internal Medicine*, 22(11):1596–602.

Hargreaves Heap, S.P., Koop, C., Matakos, K., Unan, A., Weber, N., (2020), Covid-19 and people's health-wealth preferences: information effects and policy implications, *CEPR Covid Economics: Vetted and Real-Time Papers* 22, 26 May.

International Monetary Fund (IMF) (2020), *The great lockdown*. World Economic Outlook, 2020.

Jain, G., Gaeth, G., Nayakankuppam, D., et al. (2020), Revisiting attribute framing: The impact of number roundedness on framing, *Organizational Behavior and Human Decision Processes*, 161: 109-119.

Kahneman, D. and Tversky, A., (1984), Choices, values, and frames, *American Psychologist*, 39 (4): 341-50.

Krishnamurthy, P., Carter, P., Blair, E. (2001), Attribute framing and goal framing effects in health decisions, *Organizational Behavior and Human Decision Processes*, 85(2), 382–399.

Kuehnhanss C. Heyndels B., Hilken K. (2015), Choice in politics: Equivalency framing in economic policy decisions and the influence of expertise, *European Journal of Political Economy*, 40, 360-374.

Kuhberger, A. (1998). The Influence of Framing on Risky Decisions: A Meta-Analysis, *Organizational Behavior and Human Decision Processes*, 75 (1): 23-55.

Lee, S., Aum, S., Shin, Y., (2020), Inequality of Fear and Self-Quarantine: Is There a Tradeoff between GDP and Public Health? *NBER Working Paper* Nr. 27100.

Levy, J., (1997), Prospect theory, rational choice, and international relations. *Int. Stud. Q.* 41, 87–112.

Lin, Z., Meissner, C., (2020), Health vs. Wealth? Public Health Policies and the Economy During Covid-19, *NBER Working Paper* Nr. 27099.

Linde, J., Vis, B., (2014), Do behavioral theories like prospect theory apply to political actors? An experimental test on a sample of Dutch parliamentarians and students. Dutch/Flemish Politicologenetmaal. Maastricht, The Netherlands (June).

Loewen, P., Sheffer, L., Soroka, S., Walgrave, S., Shaefer, T., (2014), Expertise and efficacy in elite political decision making. Behavioral Models of Politics Conference. Duke University (October, URL http://sites.duke.edu/2014bmp/files/2014/10/Loewen_et_al.pdf).

McDermott, R., (2004), Prospect theory in political science: gains and losses from the first decade. *Polit. Psychol.* 25, 289–312.

McKibbin, W., Fernando, R., (2020), *The economic impact of COVID-19*, In Baldwin., R., and Weder di Mauro, B. *(eds.)*, Economics in the Time of COVID-19, a VoxEU eBook, CEPR Press.

Mercer, J., (2005), Prospect theory and political science. *Ann. Rev. Polit. Sci.* 8, 1–21.

Montenovo L., Jiang, X., Lozano Rojas, F., Schmutte, I.M., Simon, K., Weinberg, B., Wing, C., (2020), Determinants of Disparities in Covid-19 Job Losses, *NBER Working Paper* No. 27132.

Mikels J.A., Shuster M.M., Thai S.T., Smith-Ray R., Waugh C.E., Roth K., Keilly A. (2016), Messages That Matter: Age Differences in Affective Responses to Framed Health Messages., *Psychology and Aging*, 31(4): 409- 414.

O'Keefe D.J., Jensen J.D. (2007), The relative persuasiveness of gain-framed and loss-framed messages for encouraging disease prevention behaviors: A Meta-Analytic Review, *Journal of Health Communication*, 12(7): 623–644.

Quattrone, G., Tversky, A., (1988), Contrasting rational and psychological analyses of political choice. *Am. Polit. Sci. Rev.* 82, 719–736.

Schnellenbach and Schubert, (2015), Behavioral political economy: A survey, *European Journal of Political Economy*, 40, 395-417.

Settele, S., Shupe, C. (2020), Lives or Livelihoods? Perceived Tradeoffs and Public Demand for Non-Pharmaceutical Interventions, *CEBI Working Paper19/20.*

Thaler R. (1980), Toward a positive theory of consumer choice, *Journal of Economic Behavior & Organization*, 1 (1): 39-60.

Tversky D., Kahneman D. (1979), Prospect Theory: An analysis of decision under risk, *Econometrica*, 47(2): 263-292.

Tversky D., Kahneman D. (1981), The Framing of Decisions and the Psychology of Choice, *Science*, 30 (211), 4481: 453-458.

Wren-Lewis, S. (2020), *The economic effects of a pandemic*, In Baldwin., R., and Weder di Mauro, B. *(eds.)*, Economics in the Time of COVID-19, a VoxEU eBook, CEPR Press.

Appendix A. Survey Proposed to Students

The purpose of this research is to study individual behavior in response to the COVID-19 epidemic.
Completing the questionnaire takes less than 10 minutes. You will be asked to indicate your behavior in the coming months and your opinion on the policies that aim to decrease the spread of the virus. You will also be asked for personal or sensitive information that is important to the study results, some of which may make you feel anxious or embarrassed.
What do I need to know about a research project?
• The data is collected anonymously.
• Your participation is completely voluntary.
• You can decide not to be part of the project.
• This decision will not be used against you.
• You can ask any question you want before deciding.
Who can I talk to?
If you have any questions, concerns or complaints or if you think the research has damaged you, please contact Prof. Francesca Gioia at the e-mail address francesca.gioia@unical.it.
The information will be processed in compliance with privacy protection laws and used to publish summaries of the study results in academic journals, on the internet or at research conferences. You will not be directly identified in any publications or reports related to this study.

Survey
1) Department offering your degree program
2) Place of residence
3) Gender
4) Age

5) Is there anyone (including you) of your close acquaintance (relative, friend) who tested positive to COVID-19?

6) Some research shows that the closure of non-essential activities was accompanied in Italy by a reduction of Rt (an indicator of the spread of the epidemic) from 8.2 to 0.4. However, each week of non-essential business closures seems to reduce a country's income and profits by 0.75%. If you were the head of government and the following scenarios were proposed to you for the next two months, which one would you choose:
a) No closure, Rt = 8.2, Reduction of gross domestic product = 0%;
b) Closes ¼ of non-essential activities, Rt = 6.15, Gross domestic product reduction = 1.5%;
c) Half of non-essential activities close, Rt = 4.1, Gross domestic product reduction = 3%;
d) All non-essential activities close, Rt = 0.4, Gross domestic product reduction = 6%.

7) The government is planning the reopening after the temporary self-isolation measures introduced to deal with the coronavirus emergency. At this stage, it is necessary to consider the consequences that each decision has in terms of protection (costs for the worsening) of health - number of infections- and protection (costs for the worsening) of the economic situation. If you were the head of the government, which strategy would you choose?" The four combinations of A e B were also proposed in the question.
   a) I would consider extremely the A of health and not much the B of the economic situation
   b) I would consider very much the A of health and a little bit the B of the economic situation
   c) I would consider enough the A of health and enough the B of the economic situation
   d) I would consider a little bit the A of health and very much the B of the economic situation
   e) I would consider not much the A of health and extremely the B of the economic situation

8) From 0 to 100, to what extent DO YOU INTEND TO FOLLOW the following behaviors after May 3rd? [0…100]
   a) Stay at home as much as possible
   b) Do not attend social events
   c) Wear face mask when I have to go out
   d) Stay at least 2 meters from other people
   e) Wash your hands frequently
   f) Staying home when sick
   g) Avoid hugs and handshakes

9) To what extent do these statements correspond to how you are feeling now?
   a) I am nervous when I think about the current situation

b) I am calm and relaxed
c) I am worried about my health
d) I am concerned about the health of my family
e) It stresses me out of the house

10) Over the past 2 weeks, how often have you bothered with each of the following issues?
   [not at all, several days, more than half the days, and nearly every day]
   a) Little interest or pleasure in doing things
   b) Feeling down, sad or hopeless
   c) Troubles falling or staying asleep or sleeping too much
   d) Feeling tired or having little energy
   e) Poor appetite or overeating
   f) Feeling bad about yourself or that you are a failure or have let yourself or your family down
   g) Trouble concentrating on things, such as reading the newspaper or watching television
   h) Moving or speaking so slowly that other people could have noticed/ or the opposite being so fidgety or restless that you have been moving around a lot more than usual

11) To what extent do you think these characteristics describe you? I see myself as a person who is:
   a) Extroverted, exuberant
   b) Reliable, self-disciplined
   c) Anxious, easily agitated
   d) Selfless, who thinks a lot about others
   e) Open to new experiences, with many interests
   f) Disorganized, distracted

12) How many square meters is your home?
13) How many people are living in the house with you right now?
14) What is your father's educational qualification?
15) What is your mother's educational qualification?

16) From the beginning of the coronavirus emergency to today, is your father working?
   a) No, he didn't even work before the emergency
   b) No, due to the emergency but he receives income
   c) No, due to the emergency and does not receive income
   d) Yes, from home
   e) Yes, keep going to work

17) From the beginning of the coronavirus emergency to today, is your mother working?
   f) No, he didn't even work before the emergency
   g) No, due to the emergency but he receives income
   h) No, due to the emergency and does not receive income
   i) Yes, from home
   j) Yes, keep going to work

Appendix B: Heterogeneous impact of framing: econometric analysis

Table B1: Predetermined characteristics and background

	Males	Females	Low Age	High Age	Low P Edu	High P Edu
	(1)	(2)	(3)	(4)	(5)	(6)
HP-EC	0.0562	0.2791***	0.2785***	0.1583***	0.1327**	0.2529***
	(0.0826)	(0.0507)	(0.0653)	(0.0585)	(0.0647)	(0.0590)
HP-EP	0.0499	0.0507	0.0572	0.0213	-0.0734	0.1220**
	(0.0861)	(0.0510)	(0.0661)	(0.0601)	(0.0643)	(0.0604)
HC-EP	-0.1056	-0.0360	-0.0252	-0.0735	-0.1145*	-0.0303
	(0.0867)	(0.0530)	(0.0655)	(0.0613)	(0.0658)	(0.0627)
CONTROLS	YES	YES	YES	YES	YES	YES
Observations	535	1301	824	1012	886	950

Notes: Standard errors (corrected for heteroscedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

Table B2: Personality traits

	Altruist		Trustworthy		Extroverted	
	No	Yes	No	Yes	No	Yes
	(1)	(2)	(3)	(4)	(5)	(6)
HP-EC	0.1656***	0.3703***	0.1434***	0.3704***	0.2037***	0.2731
	(0.0475)	(0.1013)	(0.0510)	(0.0824)	(0.0440)	(0.2518)
HP-EP	0.0249	0.0594	-0.0143	0.1641*	0.0448	-0.0676
	(0.0485)	(0.0995)	(0.0510)	(0.0863)	(0.0446)	(0.2456)
HC-EP	-0.0635	-0.0121	-0.1249**	0.0913	-0.0685	0.1252
	(0.0486)	(0.1072)	(0.0524)	(0.0844)	(0.0453)	(0.2415)
CONTROLS	YES	YES	YES	YES	YES	YES
Observations	1442	394	1308	528	1733	103

Notes: Standard errors (corrected for heteroscedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

Table B3: Covid-19 health and economic implications

	Experienced Covid-19		Parents Unemployed		Depression Severity Scale		Anxiety Severity Scale	
	No	Yes	No	Yes	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HP-EC	0.2098***	0.2444*	0.1721***	0.2623***	0.1686***	0.2611***	0.1808***	0.2224***
	(0.0460)	(0.1303)	(0.0512)	(0.0867)	(0.0577)	(0.0663)	(0.0611)	(0.0620)
HP-EP	0.0299	0.0918	0.0207	0.0350	-0.0116	0.0859	0.0274	0.0415
	(0.0466)	(0.1300)	(0.0527)	(0.0845)	(0.0612)	(0.0640)	(0.0617)	(0.0627)
HC-EP	-0.0765	0.0977	-0.0573	-0.0524	-0.0445	-0.0765	-0.0441	-0.0699
	(0.0470)	(0.1376)	(0.0532)	(0.0870)	(0.0601)	(0.0668)	(0.0623)	(0.0646)
CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1598	238	1329	507	919	917	925	911

Notes: Standard errors (corrected for heteroscedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

Table B4: Baseline preferences

	Economic Oriented	Middle	Health Oriented
	(1)	(2)	(3)
HP-EC	0.2697***	0.1955***	0.1519*
	(0.0946)	(0.0630)	(0.0816)
HP-EP	0.0002	-0.0163	0.1017
	(0.0998)	(0.0586)	(0.0828)
HC-EP	-0.1170	-0.0577	-0.0611
	(0.0926)	(0.0637)	(0.0798)
CONTROLS	YES	YES	YES
Observations	397	810	629

Notes: Standard errors (corrected for heteroscedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.