Experiments on risk framing and moral appeal in the context of the coronavirus spread

Pre-Analysis Plan for the fourth survey wave

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1 Introduction

Following up on a first survey wave in March 2020, a second in August 2020, and a third in December 2020, this study continues in aiming at an improved understanding of the private contributions to a public good under uncertainty as well as related questions on compliance. The coronavirus SARS-CoV-2 disease (COVID-19) still dominates life in Germany and all over the world. After a first infections wave in spring 2020, and a second much higher wave in winter 2020/2021, infections are at a relatively low level. On July 6, 2020, for example, 440 new infections have been reported in Germany as well as 31 deaths due to COVID-19. Nonetheless, mutations are now spreading all over the world and driving new infections, with the SARS-CoV-2 Delta variant being the most dangerous so far. While vaccinations are available in Germany since spring 2021, 56 percent of the German population received at least one vaccination shot and 39 percent are fully vaccinated (as of July 4th, 2020). As a substantial share of the population is not yet fully vaccinated and while it is uncertain how effective the current vaccinations are against new mutations of the coronavirus, we are focusing on public health effects and behavioral adjustments to protect against an infection with the coronavirus. Individuals can contribute to this public good by keeping physical distance to others and by increasing their hygienic efforts. In addition to the focus on physical distancing and increased hand-washing, we also ask about other contributions to the public good like wearing a face-mask, and the willingness to get vaccinated for those that have not received a vaccination, yet.

This pre-analysis plan is structured as follows: Section II describes the background and procedures of the fourth survey wave. Section III lists all data that we elicit as part of this wave and section IV reports pre-specified hypotheses in addition to those of our first, second, and third survey wave.

2 Procedures

This survey wave is part of a panel survey experiment. We already conducted three survey waves and will, depending on the pandemic spread, collecting further survey waves if necessary.[1] Our survey includes questions on subjects' current health level, past and planned behavior related to the corona pandemic, support for governmental efforts to slow the spread of the virus, stated preferences as well as incentivised experiments on truth-telling and risk-taking.

In the fourth survey wave, we try to reach all previous respondents again that participated in the first, second, and third survey waves in March, August and December 2020. Those which we cannot reach again, will be replaced with a fresh sample of new respondents such that we end up with a sample size of approximately 3,000. Depending on respondents' willingness to participate in the survey again, we hope to reach between 1,500 and 2,000 of the previous respondents in the fourth survey wave. We will expect to add between 1,000 to 1,500 new respondents as a fresh sample.

We started the fourth wave on June 24th, 2020. We plan to collect most responses within 7 days by July 1st, 2021 but allow for more time for participants that participated in previous waves. The whole data collection should be completed by July 8th, 2021 at the latest (i.e. within 2 weeks).

The start of the data collection is scheduled at a time when there are moderate restrictions on public life. While the number of infections is at a low level, many restrictions have been relaxed such as meeting restrictions for private contacts and public events, closures of restaurants, schools. Nonetheless, most federal states impose local restrictions if necessary. While most travel restrictions in most other countries have been relaxed, they have been strengthened for some countries in order to avoid a spillover of coronavirus mutations.

In addition to the information treatments that we outline in the next section, will exploit three natural sources of variation in the risk to get infected with the coronavirus (resulting in different ratios of private and external benefits of behavioural change):

1. spatial heterogeneity,
2. heterogeneity across societal groups (e.g., respondent's age, such as being older than 60, respondents with pre-existing chronic illnesses), and
3. heterogeneity over time in the course of the pandemic dissemination.

The survey will be conducted by an independent research company (respondi, `https://www.respondi.com/EN`) that recruits participants and handles payments. Recruitment of participants follows a stratified random sampling procedure against criteria such as age, gender, income and education. While in the first survey wave quotas were managed actively to guarantee the sample's representativeness regarding these criteria, the sample in this fourth survey wave depends on how the willingness to participate again is distributed among socio-economic groups. The subsample with fresh respondents, in contrast, will be actively managed to ensure representativeness regarding these criteria. The money that respondents earn in our three experiments is paid out to them as so-called "mingle points" and one mingle point is worth 1 Euro-Cent.

[1] Our previous pre-analysis plans are pre-registered at the AEA RCT Registry (`https://doi.org/10.1257/rct.5573-1.1`) and we published parts of the data of the first survey wave at the Harvard Dataverse (`https://doi.org/10.7910/DVN/WEIWDK`).

3 Data and variables

Table 1 provides the variables that we collect as part of the fourth survey wave. Some of the questions are only asked to participants in the fresh sample as they would be redundant for those who participated in a previous survey wave already. Other questions depend on previous answers and might be asked for clarification purposes. We indicate potential filtering options in Table 1 in italic.

Table 1: List of variables (rough translation from German)

Number	**Question**
First of all, we have two questions regarding your general life satisfaction	
1	How satisfied are you with your life in general?
2	Would you agree with the following statement? "Much of the time during the past week I was happy."
3	*Only for participants in the fresh sample:* In which year were you born?
4	*Only for participants in the fresh sample:* What is your gender?
5	*Only for participants in the fresh sample:* What is the zip-code of your home?
6	*Only for participants in the fresh sample:* What is your level of education?
7a	*Only for participants in the fresh sample:* How many people do you count among your personal circle of family and friends with whom you are in regular contact (i.e. at least once every 3 months)?
7b	*Only for participants in the fresh sample:* How many of them are over 60 years old?
8a	*Only for participants in the fresh sample:* How many people live in your household? (please include yourself)
8b	*Only for participants in the fresh sample:* How many people in your household are children under the age of 18?)
8c	*Only for participants in the fresh sample:* How many people in your household are older than 60 years?)
9	*Only for participants in the fresh sample:* What is your monthly net household income (the remuneration of all household members, after deduction of taxes and social securities)?)
10	What do you expect approximately how your annual income will change in the current year 2022 compared to 2019? (in percent)
11	How high was your monthly net household income in May 2021 compared to February 2020? (in percent)

Table 1: List of variables (continued)

Number	Question
12	Are you currently employed? Which one of the following applies best to your status? [Employed full-time, Employed part-time, in marginal or irregular employment, not employed]
13	*If any employment in Q13:* What is your current occupational status? [Self-employed, Blue-collar worker, White-collar worker, Civil servant, Student / Apprentice / Trainee / Intern]
14	*If any employment in Q13:* What is the minimum share of your working time, that you need to spend at a place that your employer determines (e.g. in his offices or rooms, on his property, at customers)? (in percent)
15	*If any employment in Q13:* If you can work from home, to which share of your total working time are you using this option? (in percent)
16	Do you belong to a church or religious community?
17	*If "yes" in Q17:* Which church or religious community do you belong to?
18	To what extent do you experience the emotion "fear" at the moment?
19	Please tell us: How willing are you to take risks with regard to your finances?
20	Please tell us: How willing are you to take risks regarding your health?

Task 1: Investment game based on Gneezy and Potters (1997), following the implementation by Cohn et al. (2015, 2017). We randomize the payoff profile across two groups:

Now we come to a task where you can earn additional money (mingle points). You will receive 100 Euro-Cent from us for this. You can use this money to invest it in a risky asset. Please decide now, which share of it you want to invest in the risky asset. You will receive the amount that you do not invest for sure.
The risky investment works as follows:
- You have a 50% chance of winning 2.5 times your investment.
- You have a 50% chance of losing your investment.

[**Investment Group A:**] You win if the super number (between 0 and 9) of the Saturday Lotto drawing on July 17, 2021 (www.lotto.de) is one of the numbers 0, 1, 2, 3, or 4. You lose if the super number of this draw is one of the numbers 5, 6, 7, 8, or 9.
[**Investment Group B:**] You win if the super number (between 0 and 9) of the Saturday Lotto drawing on July 17, 2021 (www.lotto.de) is one of the numbers 5, 6, 7, 8, or 9. You lose if the super number of this draw is one of the numbers 0, 1, 2, 3, or 4.

Therefore, the amount you earn by investing in this task is calculated as follows:
- If you win: Payout = 100 Euro-Cent minus investment plus (2.5 x investment)
- If you lose: Payout = 100 Euro-Cent minus investment

Table 1: List of variables (continued)

Number	Question
Investment	How many Euro-Cent would you like to invest (0 - 100)?

Information treatment: Participants are randomized across three groups:
Group A: sees Text I
Group B: sees Text I + II
Group C: sees Text I + III

We now ask you to carefully read the following text. We will ask you a related question on the next page

Text I (Biodiversity): According to the assessment of the World Biodiversity Council, one million animal and plant species are threatened with extinction worldwide. Human alteration and destruction of natural habitats has been primarily responsible for the decline in biodiversity since 1970. While agricultural production and material exploitation of nature (timber harvest, bioenergy production, fish harvest) have increased since 1970, all other services provided by intact nature have declined (including soil quality, air pollution control, pollination, flood protection). Source: Brondizio et al. (2019)

Text II (Infectious diseases): According to the German Federal Ministry of Health, infectious diseases are one of the most common causes of death worldwide. Most deaths are caused by pneumonia, diarrheal diseases, tuberculosis and malaria, and in recent years increasingly by new infectious diseases such as AIDS, SARS and COVID-19. According to the World Health Organization, more than 3.7 million people have died worldwide as a result of COVID-19 alone. Infectious diseases are caused by bacteria, viruses, fungi, or parasites. Source: Federal Ministry of Health (2021), World Health Organisation (2021)

Text III (Zoonotic diseases): According to the World Biodiversity Council, COVID-19 is one of many new infectious diseases transmitted by viruses from wild animals to humans. These so-called zoonotic diseases arise from human-induced environmental changes that bring wildlife, livestock, and humans into closer contact. Increasing alteration and destruction of natural habitats and inappropriate treatment of animals makes it more likely that more viruses will spillover from wildlife to humans, leading to more pandemics. Source: Daszak et al. (2020)

21	Please answer the following question according to your personal assessment: **Group A:** Until 2050, global biodiversity will, due to changes to natural habitat, [decline a lot ... increase a lot] **Group B:** Until 2050, worldwide deaths will, due to infectious diseases, ... [decline a lot ... increase a lot] **Group C:** Until 2050, the quantity of pandemics will, due to zoonotic diseases, ... [decline a lot ... increase a lot]

[The questions not beeing asked here, will be presented in Q23b and Q23c]

Table 1: List of variables (continued)

Number	Question
	Task 2: We now come to a task where you can earn additional money (mingle points). You will receive 100 Euro-Cent from us for this. You can allocate these 100 Euro-Cent and transfer them either to your mingle-account or donate them to a non-profit organization that engages in protecting natural habitats of endangered species. First, please decide which of the following non-profits organizations you would be most likely to give a donation to because you think a donation to that organization will actually make a difference in protecting endangered species and their habitats: *[presented in a randomized order]* 1) Naturschutzbund Deutschland e.V. (NABU)/Birdlife International 2) Bund für Umwelt und Naturschutz Deutschland e.V. (BUND)/ Friends of the Earth 3) World Wide Fund for Nature (WWF) 4) Greenpeace e.V. 5) None of these
	Please now allocate your endowment of 100 Eurco-Cent: Own account: Donation to [selected non-profit organization]: *[If no organization has been selected, then a random organization is picked.]*
	We would now like to ask you about your assessment of the EU-Biodiversitystrategy. In order to protect Europe's biodiversity, the European Commission wants, among other things, to place at least 30% of Europe's land areas under nature protection as part of the EU Biodiversity Strategy for 2030. So far, protected areas, under the Natura 2000 network, account for about 18% of the EU's land area. Protected areas serve, among other things, to preserve biodiversity and ecosystem functions for present and future generations. Depending on the nature of the protected area, other uses, such as those by agriculture and forestry or construction activities for housing, commerce or infrastructure, are subject to various restrictions.
	Please tell us, how you assess this goal from a societal point of view:
22a+b	In your opinion, what should be the percentage of biodiversity conservation areas in the EU in 2030? Please indicate the minimum and maximum acceptable value for you. [in percent ranging from 0 to 100]
22c	*[Question not asked in Q22]*
22d	*[Question not asked in Q22]*
	We would now like to ask you some questions about your health state and the consequences of an infection with the coronavirus.
23	*Only for participants in the fresh sample:* Do you have one or more of the following diseases? [Heart disease, Lung disease, Liver disease, Diabetes, Cancer, Weakened immune system]

Table 1: List of variables (continued)

Number	Question
24	How do you assess your health status? [very good, ... , very bad]
We would now like to ask you some questions regarding an infection with the coronavirus.	
25	If you have the opportunity to get tested for a corona infection, how willing are you to get tested, even if this involves additional effort for you?
26	How often have you been tested on COVID-19 with a PCR-test?
27	How often have you been tested on COVID-19 with a rapid test during the past 4 weeks?
28	Have you been tested positive for COVID-19?
29	Have you already fallen ill with the coronavirus? [Yes, No, Maybe, No answer]
	If "No", "Maybe" or "No answer" in Q30:
30a	How likely do you think it is that you will become infected with the coronavirus or that you have already been infected?
30b	How likely do you think it is that if you are infected, you will only get sick mildly?
30c	How likely do you think it is that if you are infected, you will be in acute danger of death in case of infection?
31	*If "Yes" in Q27:* Have you recovered after the corona infection?
32	How many persons among your family members and friends, with whom you are regularly in contact (i.e., at least once every 3 months), got infected with the coronavirus?
	If answers is greater than zero in Q32:
33a	How many persons among your family members and friends, with whom you are regularly in contact (i.e., at least once every 3 months), have been treated due to the coronavirus in a hospital?
33b	How many persons among your family members and friends, with whom you are regularly in contact (i.e., at least once every 3 months), died due to the coronavirus?
We would now like to know to what extent the following statements apply to you. In the following, "physical, social contact" refers to situations in which you come closer than two metres to other people.	
34	Compared to the same time period in 2019, by what percentage have you reduced or increased your physical, social contacts in the past 7 days?
35	How many people on average came closer than 2 meter to you on a single day? (Please calculate the average number for the past 7 days)

Table 1: List of variables (continued)

Number	Question
36	Compared to the same time period in 2019, by how many percent have you reduced or increased your intensive hand washing (longer than 20 seconds) in the past 7 days?
37	As far as you reduce physical, social contacts or take protective efforts such as intensive hand washing, in what proportions (in percentage points that sum up to 100%) do you do this in order to - Protect yourself and members of your household [x%] - Protect your family and close friends [y%] - To protect other people [100-x-y%]
We now have a question regarding your future expectations.	
38	What do you expect, when will we be able to live again without substantial restriction due to COVID-19?
We would now like to know what you are planning for the next 7 days:	
39	Compared to the same time period in 2019, by what percentage will you reduce or increase your physical, social contacts in the next 7 days?
40	Compared to the same time period in 2019, by what percentage will you reduce or increase your intensive hand washing (longer than 20 seconds) in the next 7 days?
We would now like to know to what extent you agree with the following statements.	
41	The current government measures to contain the COVID-19 pandemic are... [going way too far, ..., are not nearly enough]
42	Relative to the governmental regulations, I will limit my physical, social contacts as follows: [participation in Corona-parties, ..., complete avoidance of all contacts]
43	Did you had the chance already to get vaccinated against the coronavirus? [yes, no, NA]
44	Did you get already vaccinated against the coronavirus? [yes, no, NA]
45	*If "no" in Q45:* How likely is it that you will get vaccinated voluntarily? [impossible, ..., for sure]
46	*If not "impossible" in Q46:* If you would get vaccinated voluntarily, in what proportions (in percentage points that sum up to 100%) do you do this in order to - Protect yourself and members of your household [x%] - Protect your family and close friends [y%] - To protect other people [100-x-y%]
47	*If "yes" in Q45:* If you already got vaccinated voluntarily, in what proportions (in percentage points that sum up to 100%) did you do this in order to - Protect yourself and members of your household [x%]

Table 1: List of variables (continued)

Number	Question
	- Protect your family and close friends [y%] - To protect other people [100-x-y%]
48	How many persons among your family members and friends, with whom you are regularly in contact (i.e., at least once every 3 months), got vaccinated against the coronavirus? [in percent]
We would now like to know, by how much you agree to the following statements.	
49	It should be compulsory, to get a vaccination against the coronavirus. [completely disagree, ..., fully agree]
50	Relative to the governmental regulations, I am wearing my face-mask... [never, ..., as requested, ... , always]
51	If somebody is not wearing his face-mask at a place where it is required to do so by regulations, or if somebody is not wearing it correct (e.g., by not covering the nose),. . . - this bothers me [not at all, ... , a lot] - I will point this out to that person [not at all, ..., energetic] - I will point this out to other persons [not at all, ..., energetic]
52	If you wear a face-mask, in what proportions (in percentage points that sum up to 100%) do you do this in order to - Protect yourself and members of your household [x%] - Protect your family and close friends [y%] - To protect other people [100-x-y%]

Task 3: Coin tossing game, such as by Abeler et al. (2014), implementation following Cohn et al. (2014). We randomize participants into three main groups. In group B and C, we then randomize respondents again into two subgroups such that respondents can either win if the super number is (a) even or (b) odd.

Group X: Now, we come to another task where you can earn additional money (mingle points). In this task, your additional payout is decided by coin tosses. Please get a coin with heads and tails for this.
Your task is to toss the coin exactly 10 times. Every time you toss "tails", you will receive 0.20 Euro, for a total of up to 2.00 Euro.
Please enter the number of your tosses with "tails" at the top in the following field:

Group Y: Now, we come to another task where you can earn additional money (mingle points). In this task, your additional payout is either decided by coin tosses or by the next public lottery draws. Please get a coin with heads and tails for this.
Your task is to toss the coin exactly 10 times. If you choose to be payed out for this task, you receive 0.20 Euro for each time you toss "tails", for a total of up to 2.00 Euro.

Table 1: List of variables (continued)

Number	Question
	Alternatively, you can also get payed depending on the outcome of the next ten public lottery draws starting on July 17, 2021. For each super number (between 0 and 9), that is an even [odd] number, you receive 0.20 EUR, for a total of up to 2.00 Euro. Irregardless of your choice, you will always be payed out at the same time. Please decide now, if your payout should be based on your coin toss or for the public lottery. [Coin toss, public lottery] Now, please toss your coin ten times and report the number of tosses with "tails" at the top. Note, If you choose to be payed out for your coin toss, this answer is relevant for your payoff. If you choose to get payed out based on the lottery, we nonetheless need your answer for the sake of completeness. **Group Z:** Now, we come to another task where you can earn additional money (mingle points). In this task, your additional payout is either decided by coin tosses or by the next public lottery draws. Please get a coin with heads and tails for this. Your task is to toss the coin exactly 10 times. If you choose to be payed out for this task, you receive 0.20 Euro for each time you toss "tails", for a total of up to 2.00 Euro. Please enter the number of your tosses with "tails" at the top in the following field: Alternatively, you can also get payed depending on the outcome of the next ten public lottery draws starting on July 17, 20221. For each super number (between 0 and 9), that is an even [odd] number, you can receive 0.20 EUR, for a total of up to 2.00 Euro. Please decide now, if your payout should be based on your coin toss or for the public lottery. [Coin toss, public lottery]
	The following question is adapted from Falk et al. (2018). It is repeated up to 5 times with varying payoffs for the future time period. Imagine, you would have the choice to receive a monetary payoff today or in 12 months. We will present you five situations in which the payoff today is always the same. The payoff in 12 month, however, will differ in each situation. For each situation, we would like to know which payoff you prefer. Please assume that there is no inflation, such that future prices are the same as today.
54	Please assess the following situation. Would you rather prefer 100 Euro today or 154 Euro in 12 months. [Today, in 12 months, do not know / prefer to not answer]
	Please answer the following questions:
55	How willing would you be to give up something that is beneficial for you today in order to benefit more from that in the future?
56	How much would you be willing to punish someone who treats you unfairly, even if there may be costs for you?

Table 1: List of variables (continued)

Number	Question
57	How much would you be willing to punish someone who treats others unfairly, even if there may be costs for you?
58	How much would you be willing to give to a good cause without expecting anything in return?

In addition to the variables collected as part of this survey, we will collect observable data that can be matched to respondents through information about their zip-code. Among those information will be the number of officially confirmed COVID-19 incidents by the Robert Koch Institute (https://survstat.rki.de/), the number of deaths from COVID-19, and regulatory stringency. As these types of information might not be available on the zip-code level but on the county level, our matching might be based on a higher spatial aggregation.

COVID_incidence	Number of officially confirmed COVID-19 incidents per county (Source: Robert-Koch-Institute)
COVID_death	Number of officially confirmed COVID-19 deaths (Presumably on the county level by Robert-Koch-Institute)
Reg_string	Regulatory Stringency (Based on regulations by the individual federal states, following classifications - if applicable - by the Oxford COVID-19 Government Response Tracker (OxCGRT))

4 Hypotheses of individual sub-projects for the fourth survey wave

Following up on our hypotheses of our first, second, and third survey wave, we update them as follows:

A. Risk attitudes, risk exposure and the private provision of a public good under uncertainty

Economic theory predicts that risk-averse individuals may provide more of a public good if they (also) benefit from a (private) risk-reducing effect of providing the public good. For example, Bramoullé and Treich (2009) consider a game with pollution emissions that generate stochastic damage that has a public good character. They show that risk increases individual abatement efforts and thus private provision of the public good. As a consequence, risk may increase welfare. Quaas and Baumgärtner (2008) and Baumgärtner and Quaas (2010) show that individual efforts to conserve biodiversity increase with risk and risk aversion due to the natural insurance function of biodiversity. Also, lab experiments in threshold public good games suggest that risk may lead to improved outcomes (McBride, 2006; Tavoni et al., 2011; Barrett and Dannenberg, 2014). Here we aim to use the data from the survey to test the implications of the theory and the validity of those lab experiments.

Individual protective measures with respect to the coronavirus have exactly the property that they reduce, at the same time, the individual probability of getting infected and the probability to spread the virus. Thus, we expect that risk averse individuals would contribute more to the public good.

We measure individual risk aversion by stated preferences (W1Q10, W1Q11, W2Q17, W2Q18, W3Q20, W3Q21, W4Q19, W4Q20) and revealed preferences (W1Q12, W2Investment, W3Investment, W4Investment). The amount of private provision of the public good is measured by stated past and planned individual defence efforts (W1Q17, W1Q18, W1Q20, W1Q21, W2Q30, W2Q32, W2Q36, W2Q37, W3Q32, W3Q34, W3Q37, W3Q38, W4Q34, W4Q36, W4Q39, W4Q40), the assessment of public policies (W1Q22, W1Q23, W2Q38, W2Q39, W2Q42, W2Q43, W3Q39, W3Q40, W3Q43, W3Q44, W4Q41, W4Q49, W4Q50), the willingness to get vaccinated voluntarily (W2Q40, W3Q41, W4Q45). We further need to control for individual risk exposure with respect to the severity of health damage in case of an infection (age, health); with respect to the (objective or subjective) probability of infection; and with respect to the effect on close relatives (household members, family and friends).

We will test the following hypotheses by means of multivariate regression, using the variables specified in the previous paragraph. All the following hypotheses are ceteris paribus, i.e. controlling for the effect of the other variables.

- *A_H1: Private provision of the public good increases with risk aversion.*
- *A_H2: Private provision of the public good increases with individual risk.*
- *A_H3: Private provision of the public good increases with the aggregate risk of household members and friends (number of elderly people).*
- *A_H4: Private provision of the public good increases relatively more with overall risk ($COVID_incidence$) for those who state a higher share for being motivated for a concern for other people (W1Q19, W2Q33, W2Q41, W2Q45, W3Q35, W3Q42, W3Q46, W4Q46, W4Q52).*

B. Coin-tossing: temporal stability and experience effects

In all four survey waves, we conducted a coin tossing experiment (following the 10 coin tosses of Cohn et al. (2015)). As far as we are aware, this is the first large-scale panel study on coin tossing. If cheating on a coin-tossing experiment is a stable predictor of social preference on honesty, we would expect that there is some consistency in over-reporting. We thus hypothesize:

- *B_H1a: Reporting of coin-tosses is positively correlated within subjects over all survey waves.*
- *B_H1b: This correlation is particularly strong for those with very low (0,1,2 winning coin tosses) and very high (8,9,10 winning coin tosses) reports at their first participation.*

Having repeatedly substantially higher than average coin tosses, is getting statistically more unlikely with the number of survey rounds. Respondents that care about their reputation of being honest might therefore want to report lower coin tosses in wave 4, than they reported in wave 1, wave 2, or wave 3. We thus hypothesize:

- *B_H2a: For participants that participated in all four survey waves, the number of very high reported winning tosses (8,9, or 10 winning coin tosses) is lower in wave 4 than in wave 1, wave 2, and wave 3.*
- *B_H2b: For participants that participated in all four survey waves, the number of reported winning tosses is lower in wave 4 than in wave 1.*

C. Coin-tossing: adherence to regulations

Based on the various studies that have shown some form of external validity of the coin tossing task concerning other measures of truth-telling or cheating (e.g., Cohn and Maréchal, 2018; Potters and Stoop, 2016), we hypothesize that a similar correspondence may be observed for the case of adhering to governmental regulations in the COVID-19 pandemic response. We thus hypothesize:

- *D_H1a: The number of reported winning tosses, pooled over all survey waves, is positively correlated with non-adherence to governmental regulations (W1Q23, W2Q39, W2Q43, W3Q40, W3Q44, W4Q42, W4Q50) and negatively correlated with the private provision of public goods (W1Q17,W1Q18, W1Q20, W1Q21, W2Q30, W2Q32, W2Q36, W2Q37, W3Q32, W3Q34, W3Q37, W3Q38, W4Q34, W4Q36, W4Q39, W4Q40).*

As reporting 4 and 6 winning tosses may be correlated with reputational concerns, we also expect this to correlate with (non)-adherence to governmental regulations and the private provision of public goods. We formulate:

- *D_H1b: The number of times reporting 4 or 6 winning tosses, is positively correlated with non-adherence to governmental regulations (W1Q23, W2Q39, W2Q43, W3Q40, W3Q44, W4Q42, W4Q50) and negatively correlated with the private provision of public goods (W1Q17, W1Q18, W1Q20, W1Q21, W2Q30, W2Q32, W2Q36, W2Q37, W3Q32, W3Q34, W3Q37, W3Q38, W4Q34, W4Q36, W4Q39, W4Q40).*

- *D_H2: The average number of reported winning tosses across all waves is positively correlated with the number of reported corona infections (W3Q26, W4Q28).*

D. Hypotheses on truth-telling treatments

We added two treatment variations (groups Y and Z) to the standard coin-tossing task to manipulate intrinsic lying and reputational costs (following the recent literature summarized in Abeler et al., 2019), retaining our previous coin tossing design as Group X (see Task 3 above).

- *D_H1: Our first hypotheses concern the comparisons of treatment group Y to control group X: We distinguish different sub-groups based on their decision to choose to be paid out via the lottery or their own coin tosses.*
  - *First, the lottery group includes 'lazy' participants (who did not toss a coin) as well as those that want to (signal) their honest behaviour (and did toss a coin). We seek to distinguish between these two by the time they spent on the coin toss page, calibrated against a standard time spent on performing the coin tosses that we calibrate against the quickest time one of four RAs required for this task. For the too-quick or 'lazy' participants, we expect strong deviations from the binomial distribution, in particular that too many will report 4 and 6 coin tosses. For those that take reasonably long, we expect that the coin toss distribution will closely approximate a binomial distribution.*
  - *Second, the coin toss group, i.e. those choosing the coin toss instead of the lottery, are comprised of those with a strong inclination to cheat upwards, as they can—in expectation—double their payoff, and those that want to strongly signal their honest reporting (not necessarily engage in honest reporting). Accordingly, we expect a strong polarization of coin reports, with substantial over-reporting of 10 successful tosses, substantially lower partial over-reporting and relatively more small reports.*
  - *Finally, We expect a higher polarization of tails among participants in Group Y compared to Group X. For those in Group Y, that spend little time on the coin tossing task, we expect a higher number of reported 4 and 6. For those that spend more time on the task, we expect their distribution of tails to be closer to a binomial distribution.*
- *D_H2: Our second hypotheses concern the comparisons of treatment group Z to control group X:*
  - *Within group Z, we expect that those who were fast and had 6 or less winning coin tosses care about their honesty reputation but do not want to take the effort to toss a coin. Hence, we expect them to choose the lottery more often. Those who were fast and had 8 or more coin tosses, presumably over-report to increase their payoff and thus do not change to the lottery (which would reduce their payoff). Those who took a reasonable amount of time for the coin tossing, or longer, presumably tossed the coin. If they reported* $0-4$ *winning tosses, we would expect them to dis-proportionally switch to the lottery, in order to improve their payoff without compromising their reputation. Only few of those with* $5-10$ *tosses switch to the lottery.*

- *D_H3: Our third hypotheses concern the comparisons of treatment group Z to control group X:*
  - *Since the coin tossing task in Group Z is identical to that in Group X, and respondents do not know that they subsequently get the choice to switch to the lottery, we expect no significant differences in the distribution of coin tosses between Group Z and Group X.*

E. Hypotheses on financial investment behavior

Following up upon our previous hypothesis that background health uncertainty increases risk aversion and hence reduces investments in our investment task, we now face a situation in which individuals can insure against parts of this background health risk by getting a vaccination against COVID-19. In light of this insurance device, we expect a weaker effect of the local number of infections on financial risk taking:

- *E_H1: Participants that have been vaccinated against COVID-19 invest more of their endowment in the risky lottery than participants without a vaccination after controlling for observables.*
- *E_H2: The local number of infections has a weaker effect on the changes in investments for participants that are vaccinated than for participants without a vaccination after controlling for observables.*

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