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

Sketch of Pre-Analysis Plan for the first survey wave

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I. Introduction

Our study aims to contribute to the understanding of private contributions to a public good under uncertainty. To this end, our study exploits the natural public good experiment of the spreading coronavirus SARS-CoV-2 disease (COVID-19) in Germany from spring 2020 onwards. The particular public good we are focusing on is public health in the face of the COVID-19 pandemic. Individuals can contribute to this public good by keeping physical distance to others and by increasing their individual hygienic efforts. As not all individuals will eventually be infected with the coronavirus SARS-CoV-2, and as the severity of the COVID-19 disease differs strongly across specific cases, the individual benefit of these efforts is uncertain, and the individual risk depends on observable variables. Given the limited information about the virus and the disease, also the public benefit is uncertain. Both private and public benefits of individual protective efforts vary with the share of population being infected. Besides contributing to a better understanding of what shapes private public good provisions under uncertainty, we are interested in what determines compliance with governmental regulations that try to contain the spread of the coronavirus.

Our analysis uses both natural variations of risk exposure and variations in the local regulatory stringency. Risk exposure systematically varies across age groups, across underlying health conditions as well as across space given the uneven prevalence of COVID-19. Furthermore, regulatory stringency differs to some degree across federal states ("Bundesländer") due to the German federalistic system. Therefore, both risk exposure and regulatory stringency will change considerably over time. We will try to capture the respective effects on risk-taking, compliance, and truth-telling over the course of three survey waves. This pre-analysis-plan focuses solely on the first wave, which includes two experimental manipulations (risk framing and moral appeals) as well as two experimental measures (risk-taking and truth-telling). Furthermore, the first wave exploits a natural experiment that substantially tightened governmental regulations ("contact ban") on admissible behavior with regards to preventing the spread of the coronavirus roughly in the middle of our first survey wave.

This pre-analysis-plan is structured as follows: Section II describes the background and procedures of our study. Section III lists all data that we elicit as part of the first survey wave and section IV reports pre-specified hypotheses across five individual sub-projects.

II. Procedures

We conduct a panel survey experiment with three waves. The 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, as well as stated preferences.

The first survey wave will encompass 3,650 respondents that are representative for the German population in terms of gender, age, education, and income. The first wave started on March 19, 2020 with a "soft launch" collecting responses of 253 participants. After a preliminary check of responses, we adjusted the scales for questions 17 and 18. The main survey started on March 20, 2020. The survey will be completed on March 27, 2020. On March 20, 2020, the German government's central scientific institution in the field of biomedicine, the Robert-Koch-Institute, reported 13,957 confirmed cases of COVID-19 in Germany, on average 17 cases per 100,000 individuals. On March 27, the Robert-Koch-Institute reported 42,288 confirmed cases, 51 per 100,000 individuals. In no federal state, the frequency of cases exceeded 100 per 100,000 individuals, and in no county, the frequency exceeded 500 cases per 100,000 individuals, by the end of the survey. Only in 18 out of 400 counties (4.5%) the frequency of cases exceeded one per 1,000 individuals. The number of fatalities increased from 31 on March 20 to 253 on March

27, 2020. Between March 17 and March 26, 2020, the Robert-Koch-Institute assessed the risk for the German population as “high”, but not “very high”. As of March 26, 2020, the assessment remained “high” for the general population, but changed to “very high” for older adults and individuals with chronic underlying conditions. Throughout the week of the first survey wave, the pandemic was dominating public life in Germany.

Depending on the willingness to participate in the survey again (and depending on the timing of the second and third survey waves), we aim for approximately 2,660 respondents in the second survey wave and approximately 1,330 respondents in the third survey wave. Out of these, in survey wave two we add approximately 660 new external respondents (“fresh sample” to the first survey wave) and in survey wave three we add approximately 330 new respondents (“fresh sample” to the first and second survey waves). The second survey wave is scheduled around the peak of the pandemic in Germany (provisionally summer 2020) and the third survey wave is scheduled for the time when the pandemic flattens out (provisionally fall / winter 2020).

For each of the two information treatments, we assign subjects with an equal probability into the respective control and treatment groups. Hence, we expect a third of all subjects in the respective control group, a third of the subjects in the first respective treatment group, and a third of all subjects in the second respective treatment group. Assignment into groups in the two information treatments is independent of each other. Our survey includes two incentivized experimental tasks to measure risk-taking and truth-telling based on Cohn et al. (2014, 2015, 2017). Please refer to Table 1 in Section III for more details.

We manipulate the risk framing and moral appeal to subjects in the two independent information treatments as follows:

1) In the first information treatment, we make risk concerning COVID-19 either more or less salient. Subjects receive factual information about the health and economic risk triggered by the coronavirus. We vary those messages and impose a high-risk and a low-risk framing.
2) In the second information treatment, we provide subjects with a statement of a medical infectologist that appeals to a subject`s moral. His statement highlights either the moral duty of subjects (deontological ethics) or subjects’ consequences (consequentialist ethics).

We 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 between societal groups (e.g., respondents older than 60, respondents with pre-existing chronic illnesses), and
3) heterogeneity over time in the course of the pandemic dissemination.

The survey is 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. The money that respondents earn in our two experiments is paid out to them as so-called “mingle points” and one mingle point is worth 1 Euro-Cent.

III. Data and variables

Table 1 provides the variables that we collect as part of the first survey wave.

Table 1. List of Variables (rough translation from German)	
Variable # | type	Question
1 | numeric	In which year were you born?
2 | string /categorical	What is your gender?
3 | numeric	What is the zip-code of your home?
4 | string /categorical	What is your level of education?
5a | numeric	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)?
5b | numeric	How many of them are over 60 years old?
6a | numeric	How many people live in your household? (please include yourself)
6b | numeric	How many people in your household are children under the age of 18?
6c | numeric	How many people in your household are older than 60 years?

7 | string /categorical	What is your monthly net household income (the remuneration of all household members, after deduction of taxes and social securities)?

Risk treatment

Baseline (R_BASE)	*High-risk framing (HRF)*	*Low-risk framing (LRF)*
The coronavirus is spreading in Germany. Many are currently observing the development closely. The following developments are in the interest of experts: →(1) The number of people who will become infected with the virus during the year and the development of the disease. →(2) The reaction of the stock market and the German economy.	The coronavirus is spreading in Germany. No one can currently predict the development exactly. Experts agree on the following: →(1) It can be expected that **three out of four** Germans will **get infected** with the coronavirus in the course of the year. In a considerable proportion of cases, the disease can become **life-threatening**. →(2) The **stock market reacts nervously** and with massive slumps to the crisis. There is a risk that supply chains will collapse and large parts of the economy will come to a standstill.	The coronavirus is spreading in Germany. No one can currently predict the development exactly. Experts agree on the following: →(1) Every individual can **effectively protect** himself or herself from getting infected with the coronavirus by avoiding physical contact with others and following hygiene rules. In **four out of five cases**, the course of the disease after an infection is very mild to mild and **no medical treatment is required**. →(2) German **economic policy has reacted** to the crisis in a **calm** and targeted manner. Employees and companies are supported with a bundle of far-reaching measures ("protective shield"). Business representatives assess the measures as constructive and effective.

8 | numeric	To what extent do you experience the emotion "fear" at the moment?
9 | numeric	What do you expect approximately how your annual income will change in the current year 2020 compared to 2019? (in percent)
10 | numeric	Please tell us: How willing are you to take risks with regard to your finances?
11 | numeric	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): 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. You win if the super number (between 0 and 9) of the Saturday Lotto drawing on April 4, 2020 (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. 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	
12 | numeric	How many Euro-Cent would you like to invest (0 - 100)? _____
We would now like to ask you some questions about your health state and the consequences of an infection with the coronavirus.	
13 | binary	Do you have one or more of the following diseases? Heart disease, Lung disease, Liver disease, Diabetes, Cancer, Weakened immune system
14 | string /categorical	Have you already fallen ill with the coronavirus?
15a | string /categorical	Filter if “No”, “Maybe” or “No answer” in Q14: If you have the opportunity to get tested for corona infection, how willing are you to get tested, even if this involves additional work for you?
15b | binary	Filter if “Yes” in Q14: Have you recovered after the corona infection?
16a | numeric	Filter if “No”, “Maybe” or “No answer” in Q14: How likely do you think it is that you will become infected with the coronavirus or that you have already been infected?

16b | numeric	Filter if “No”, “Maybe” or “No answer” in Q14: How likely do you think it is that if you are infected, you will only get sick mildly?
16c | numeric	Filter if “No”, “Maybe” or “No answer” in Q14: How likely do you think it is that if you are infected, you will be in acute danger of death in case of infection?
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.	
17 | numeric	Compared to the same week last year, by what percentage have you reduced or increased your physical, social contacts this week?
18 | numeric	Compared to the same week last year, by how many percent have you reduced or increased your intensive hand washing (longer than 20 seconds) this week?
19 | numeric	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%]

Moral appeal treatment

Baseline (M_BASE)	*Deontological appeal (M_Deont)*	*Consequentialist appeal (M_Conseq)*
	Dr. med. Kellner, who as an infectiologist treats corona patients in Leipzig, appeals to the moral duty to stop the spread of the pandemic: “In times of the corona pandemic, every person has a moral duty to stop the spread of the virus. You fulfill your moral duty by keeping a physical distance from people, paying careful attention to hygiene, and encouraging your fellow human beings to do the same. Consider to what extent	Dr. med. Kellner, who as an infectiologist treats corona patients in Leipzig, appeals to consider the consequences of personal actions: “In times of the corona pandemic, the actions of every person can have considerable consequences for the health of other people. Through their personal actions, they can break the chain of infection and thus protect especially the weakest in society from illness and death. Think about the consequences of your actions and the suffering of others,

	your personal actions are suited to break chains of infection and whether the pandemic would be contained if everyone acts like you." [photo of Dr. Kellner shown to participants]	which you can prevent by keeping a physical distance from people, paying careful attention to hygiene, and encouraging your fellow human beings to do the same." [photo of Dr. Kellner shown to participants]
MT | string	Please enter here the word that is underlined in Dr. Kellner's appeal:_____	
We would now like to know what you are planning for the coming week:		
20 | numeric	Compared to the same week last year, by what percentage will you reduce or increase your physical, social contacts in the coming week?	
21 | numeric	Compared to the same week last year, by what percentage will you reduce or increase your intensive hand washing (longer than 20 seconds) in the coming week?	
We would now like to know to what extent you agree with the following statements.		
22 | numeric	The current government measures to contain the corona pandemic are… [going way too far, …, are not nearly enough]	
23 | numeric	Relative to the governmental regulations, I will limit my physical, social contacts as follows: [participation in Corona-parties, …., complete avoidance of all contacts]	
Task 2: Coin tossing game, such as by Abeler et al. (2014), implementation following Cohn et al. (2014): 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.		
24 | numeric	Please enter the number of your tosses with "tails" at the top in the following field: [____]	
Please answer the following questions:		

25 | string /categorical	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?
26 | string /categorical	How much would you be willing to punish someone who treats others unfairly, even if there may be costs for you?
27 | string /categorical	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 the first survey wave, 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))

IV. Hypotheses of individual sub-projects for the first survey wave

A. Egoistic versus altruistic motives of private public good provisions

Coronavirus defence efforts have both private and public benefits. The higher the (perceived) individual health risk, the higher the expected private benefits

(vis-a-vis public benefits) of privately taken or publicly enforced defence efforts.

At the current state of the pandemic (as of March 19–27, 2020), physical social distancing has primarily a public good character: As the individual risk of getting infected is low, the expected private benefit of defence efforts are likely to be low. At the same time, however, many are susceptible to getting infected. Thus, an individual's defence efforts, impose positive externalities on many others. Hence, defence efforts also feature a high public benefit through those positive externalities.

Standard microeconomic theory predicts an underprovision of defence efforts as individuals are not compensated by those who are at risk (Varian, 2014). What we argue, however, is that altruism may lead to a less inefficient level of defence efforts and that we may observe such other-regarding preferences in the field.

We first examine whether and to what degree private motives drive (i) respondent's private public good provision and (ii) their support for regulations. First, we explore how much weight respondents give to themselves as well as to close friends and family members when considering defence efforts. Second, we examine to what degree altruism for others (as revealed by the relative weight put on people not being family members or friends when making defensive efforts, and by the stated preference as elicited with a question from Falk et al. (2018)) affects defensive efforts, the support for publicly enforced defensive efforts, as well as the compliance with them. In addition, we use the regional data on COVID-19 incidents and deaths as a measure of individual's risk exposure, and control for measures of local regulatory stringency when testing for their support.

A_H1: The higher the individual expected health risk (Q1, Q13, COVID_incidence, Q16a-c), the higher

> *(a) are current (Q17, Q18) and future (Q20, Q21) defensive efforts;*
>
> *(b) is the support for and compliance with regulatory enforcement of defensive efforts (Q22, Q23).*

A_H2: The higher the number of elderly among family members and friends (Q5b) as well as among household members (Q6c), the higher

> *(a) are current (Q17, Q18) and future (Q20, Q21) defensive efforts;*

(b) is the support for and compliance with regulatory enforcement of defensive efforts (Q22, Q23).

A_H3: Regardless of risk preferences and expectations, altruism (Q19: weight on "others", Q27) increases the private public good contribution (Q17, Q18, Q20, Q21).

We also expect a stronger impact of altruistic preferences by respondents with a low health risk:

A_H4: Among respondents from the low-risk group (young (Q1) AND without pre-existing chronic diseases (Q13) those with general altruistic attitudes (Q27) contribute more to the public good (Q17, Q18, Q20, Q21) and state stronger support of the public regulation (Q22, Q23).

A_H5: The lower the individual expected health risk (Q1, Q13, COVID_incidence, Q16a-c), the more defence efforts are motivated by the protection of others (vis-a-vis oneself) (Q19: responses (1) vs. (3)).

B. Effects of the regulatory shift "contact ban" in the middle of the survey wave

Roughly in the middle of the first survey wave, there was a major policy change in Germany: On Sunday evening (22.03.2020, 6–7 pm), German Chancellor Angela Merkel announced a comprehensive 9-point plan to increase defensive efforts (abbreviated hereafter as "contact ban"). Most importantly, this plan mandates first and foremost that contacts to other people outside of one's own household have to be kept to a minimum (they cannot exceed one single contact in public spaces), that parties of any kind are not acceptable in public and private spaces, and that restaurants have to be closed except for serving take-away meals. Fines for violating the restrictions are set up to 25,000 Euro.

This policy change likely impacts planned private defensive measures, expectations about the development of the pandemic including the perceived risk of getting infected, support for governmental regulations, and may also crowd out altruistic motives for the private provision of the public good. We also expect that the provision of this clear rule on how to behave leads to heterogeneous behavior that may be captured by norm that guide behavior in the coin tossing task: In particular those that report 5 or fewer tail tosses are likely to increase their compliance with the rules, as compared to those who report a very high number of tail tosses. We, therefore, examine the effects of

this natural experiment by comparing those who responded before the announcement to those that responded after the announcement via the following guiding hypotheses, while exploring sub-group effects as well:

B_H1: The "contact ban" leads to a reduction in the support for public enforcement (Q22). Specifically, we hypothesize that the support for public enforcement (Q22) after the "contact ban"

(a) remains high for members of risk groups (age (Q1 > 60), health risk (Q13), high COVID_indicence);
(b) is lower for members of low risk groups (age (Q1 < 40), no health risk (Q13), low COVID_indicence);
(c) respondents who have reduced physical social contacts (Q17) to less than 10% tend to find public efforts are too lenient.

B_H2: The "contact ban" leads to an increase of the proportion of respondents who follow the rule (median value of Q23).

B_H3: The "contact ban" increases (planned) physical distancing (Q17, Q20).

B_H4: The "contact ban" shifts beliefs towards a lower probability of getting infected (Q16a).

Finally, we hypothesize that public enforcement of private public good provision and individual motivation to provide the public good are substitutes, i.e. that the increased public regulation will crowd out individual motivation to protect others.

B_H5: The "contact ban" leads to a lower weight put on "protecting others" (Q19) as a motivation for providing the public good.

C. Effect of risk expectations on private public good contributions

Expectations can become a relevant factor for individual decision making when individuals consider the future implications of their current behavior. While the spread of the coronavirus over the coming weeks and months is uncertain, policymakers explicitly highlight the dynamic implications of current defence efforts ("flatten the curve"). Hence, we explore the effect of expectations about respondents' health risk on the private public good provision.

Our risk treatment is designed to affect respondents' expectations about the health-related and economic risk of the corona pandemic. We use the

treatment-induced variation in risk expectations to estimate the effect of expectations on the private public good provision following a two-stage approach.

In the first stage, we focus on the treatment effect on risk expectations. Our two treatments are designed to make health and financial risks salient. Thus, we expect an impact on respondent's general emotions and risk expectations, which we test through the following hypotheses:

C_H1: The more salient the (health-related and economic) risk is, the higher is the fear level (Q8).

C_H2: The more salient the (health-related and economic) risk is, the lower the expected income (Q9) and the lower the willingness to take risk (Q10, Q11).

While the information treatment focuses particularly on the spread of the coronavirus, we expect stronger changes in risk expectations about individuals' health risk. In the high (low) risk treatment, we expect that both the perceived probability of getting infected as well as the severity of potential health damages become relatively high (low):

C_H3: Respondents in the high-risk treatment (HRT) report a higher likelihood to get infected than respondents in the low-risk treatment (LRT) (Q16a).

C_H4: Respondents in the low-risk treatment (LRT) report a lower likelihood to get seriously endangered than respondents in the high-risk treatment (HRT) (Q16c).

With respect to the investment task, we do not expect any effects of the risk treatment. We control the risk profile in this task. All respondents have full information about the probability of winning and losing and are aware that winning and losing is determined exogenously. Therefore, the only effect of the risk treatment on the behavior in the investment task could be via the perceived background risk, while the actual background risk remains unaffected by the information treatment. We hypothesize, however, that the treatment effect on the perceived background risk does not change behavior on average:

C_H5: The risk treatment does not affect behavior in the investment task (Q12).

Given C_H5, the incentivized investment task would allow us to capture risk-preferences independent of the information treatment.

In the second stage, we focus on the effect of risk expectations on the private public good contribution. We expect that risk preferences and expectations about an individual's health risk both determine private public good contributions. In particular, we expect that high expectations about one's own health risk increase private public good contributions, which also reduces the individual probability of getting infected, and exacerbate risk and time preferences. Hence:

C_H6: The higher the individuals' expected health risk (Q16a-c), the higher future private public good contributions (Q20, Q21).

C_H7: Risk averse subjects (primarily Q12; additionally we also consider Q10, Q11) with high (low) expectations about their health risk (Q16a-c) will contribute more (less) to the public good (Q20, Q21) than risk averse subjects with moderate expectations.

C_H8: Subjects with a high utility of their current (future) consumption, split at the median response for (Q25), will contribute less (more) to the public good (Q20, Q21).

D. 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 risk-reducing effect of providing the public good. For example, Bramoulle 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 (Q10, Q11) and revealed preferences (Q12). The amount of private provision of the public good is measured by stated past and planned individual defence efforts (Q17, Q18, Q20, Q21) and the assessment of public policies (Q22, Q23). 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.

D_H1: Private provision of the public good increases with risk aversion.

D_H2: Private provision of the public good increases with individual risk.

D_H3: Private provision of the public good increases with the aggregate risk of household members and friends (number of elderly people).

D_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 (Q19).

E. Moral appeal treatment

Normative economic analysis draws on two major approaches of moral philosophy, namely consequentialist and deontological ethics. According to the consequentialist approach, moral evaluation of some action is based on the outcomes that can be expected from this action. The key notion of deontological ethics, with Immanuel Kant being one of the prime proponents, is on the duty to do the morally right action, irrespective of outcomes. Traditionally, welfare economics has focused on consequentialist ethics with utilitarianism as the particular theory that has become most influential to economics (e.g., Mill, 1863; Harsanyi, 1953; Maskin, 1978). Deontological ethics has gained attention in normative economics more recently (Roemer 2019). Adult German citizens are in principle familiar with both approaches in their translations to everyday life. In two treatment groups we show respondents moral appeals from a medical doctor who is treating COVID-19 patients. One is focusing on the consequences of physical distancing and washing hands for the health of others (*M_Deont)*. A second one is focusing

on the duty to act in a way that does not harm others and that could serve as a blueprint for the behavior of others *(M_Conseq)*. A third group of respondents does not see any moral appeal *(M_BASE)*.

In the standard coin-tossing experiment, no substantial negative consequences are to be expected for others. Thus we do not expect that the consequentialist moral appeal will have a large effect on behavior in the coin-tossing experiment. By contrast, not lying is a frequently evoked moral duty. We thus expect an effect of the deontological moral appeal. These considerations lead to the following hypothesis:

E_H1a: A treatment with a deontological moral appeal (*M_Deont) increases truth-telling as measured by fewer reported tail tosses in the coin tossing experiment (Q24) compared to the control group (M_BASE).*

Even though we do not expect a strong effect for the treatment with the consequentialist moral appeal, we will still consider the following hypothesis, (as stating a higher number of coin tosses causes monetary costs for the survey host):

E_H1b: A treatment with a consequentialist moral appeal (M_Conseq) increases truth-telling as measured by fewer reported tail tosses in the coin tossing experiment (Q24) only mildly over the control group (M_BASE).

Individual preventive action with respect to the spread of the coronavirus has an important effect on the health risk of others, especially at the early stage of the epidemic that prevailed in the period of the survey. Thus it is a matter of moral behavior to spend individual effort on defence measures. The moral appeals should make this moral reason more salient and thus have an effect on the planned defence efforts. We hypothesise:

E_H2: Moral appeals (both deontological and consequentialist) (M_Deont, M_Conseq) increase the planned defence efforts (Q20, Q21) as compared to the control group (M_BASE).

Moral appeals can also approach the respondents in their role as citizens of Germany or the respective federal states of Germany. The treatments where the morally right behavior is made salient may increase the support for government actions that are meant to benefit the weaker individuals in society. We thus hypothesize:

E_H3: Moral appeals (both deontological and consequentialist) (M_Deont, M_Conseq) increase the support for governmental regulations and behavior in

accordance with governmental rules (Q22, Q23) as compared to the control group (M_BASE).

Beyond the test of these specific hypotheses, we expect that a substantial number of respondents reported the extreme outcomes in the coin tossing experiment of either zero or ten winning tosses. We will explore in which observable characteristics these individuals differ from the average respondent.

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