Martini, Christina A.; Bos, Björn; Drupp, Moritz A.; Meya, Jasper N.; Quaas, Martin F.

Working Paper

Dishonesty Is Linked with the Spread of Infectious Diseases

CESifo Working Paper, No. 11381

Provided in Cooperation with:
Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

Suggested Citation: Martini, Christina A.; Bos, Björn; Drupp, Moritz A.; Meya, Jasper N.; Quaas, Martin F. (2024) : Dishonesty Is Linked with the Spread of Infectious Diseases, CESifo Working Paper, No. 11381, CESifo GmbH, Munich

This Version is available at:
https://hdl.handle.net/10419/305623

CESifo WORKING PAPERS

11381
2024

September 2024

Dishonesty Is Linked with the Spread of Infectious Diseases

Christina A. Martini, Björn Bos, Moritz A. Drupp, Jasper N. Meya, Martin F. Quaas

CESifo

Impressum:

CESifo Working Papers
ISSN 2364-1428 (electronic version)
Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH
The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute
Poschingerstr. 5, 81679 Munich, Germany
Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email office@cesifo.de
Editor: Clemens Fuest
https://www.cesifo.org/en/wp
An electronic version of the paper may be downloaded
· from the SSRN website: www.SSRN.com
· from the RePEc website: www.RePEc.org
· from the CESifo website: https://www.cesifo.org/en/wp

CESifo *Working Paper No. 11381*

Dishonesty Is Linked with the Spread of Infectious Diseases

Abstract

This paper investigates the link between dishonesty and the spread of COVID- 19 infections. In an online experiment and panel survey, 2,723 Germans completed an incentivized coin-tossing task in March 2020 and reported their infection status in four subsequent survey waves up until December 2021. We find that individuals who are most likely dishonest in the coin-tossing task at the onset of the pandemic, as they report the highest number of winning coin tosses, are more than twice as likely to get a future COVID-19 infection than the sample mean. Respondents who are most likely to have reported dishonestly also engage more in behaviors that increase the risk of becoming infected and of transmitting the infection relative to likely honest respondents. Hence, we postulate that differences in preferences and norm compliance are underlying determinants that affect behavior in the experiment and in the field. We observe a similar relationship at the country level between an incentivized measure of civic honesty and excess deaths due to COVID-19 in 22 OECD countries.

JEL-Codes: C900, I120.

Keywords: dishonesty, Covid-19 infections, excess deaths, online experiment.

Christina A. Martini
Department of Economics, Leipzig University
German Centre for Integrative Biodiversity Research (iDiv)
Halle-Jena-Leipzig / Germany
christina.martini@idiv.de

Björn Bos
Department of Economics
University of Hamburg / Germany
bjoern.bos@uni-hamburg.de

Moritz A. Drupp
Department of Economics, University of Hamburg & Hamburg Center for Health Economics / Germany
Moritz.Drupp@uni-hamburg.de

Jasper N. Meya
Department of Economics, Leipzig University
German Centre for Integrative Biodiversity Research (iDiv)
Halle-Jena-Leipzig / Germany
jasper.meya@posteo.de

Martin F. Quaas
Department of Economics, Leipzig University
German Centre for Integrative Biodiversity Research (iDiv)
Halle-Jena-Leipzig / Germany
martin.quaas@uni-leipzig.de

September 25, 2024

1 Introduction

Infectious diseases, such as COVID-19, can lead to substantial health and economic consequences (Bloom et al., 2022). To contain the spread of infectious diseases, governments often have to resort to non-pharmaceutical measures, especially for emerging viruses, with varying success (Hsiang et al., 2020). The efficacy of government interventions frequently depends, among other things, on people's compliance with regulations and their honest reports of private information (Bavel et al., 2020; Quaas et al., 2021), such as past protection efforts, physical distancing, test results, or vaccination status. The spread of infectious diseases thus may be related to the (dis)honesty of populations. We provide novel evidence supporting this hypothesis.

Dishonest behavior is commonly studied with coin-tossing or dice-rolling experiments (Abeler et al., 2014). In such experiments, individuals face a trade-off between reporting their actual outcome truthfully, which is deemed morally right and may increase reputation and reporting a higher than actual outcome to selfishly receive a higher monetary payoff (Abeler et al., 2019). Prior research demonstrates the external validity of these experimental results and shows that they may explain (dis)honesty in the field (e.g., Drupp et al. (2019)). Whereas two recent studies find that face mask wearing is related to dishonesty (Lu et al., 2022; Tobol et al., 2020), no prior study has yet examined the relationship between dishonesty and infectious diseases.

2 Methods

2.1 Experimental Design

We conducted an online panel survey and experiment with 2,723 subjects to measure truth-telling and COVID-19 infections among German residents. The panel survey started in March 2020, and we ran four follow-up surveys in August 2020, December 2020, June/July 2021, and December 2021. The survey consisted, among others, of a questionnaire (please refer to the Appendix for the full study questionnaire) and a coin-tossing task.[1] Respondents had to toss a coin ten times and report how many tosses had tails showing up (Cohn et al., 2014). They earned 0.20 Euros for every reported tail and nothing for each head.

[1] The larger study was pre-registered (www.socialscienceregistry.org/trials/5573) and also included two information treatments that were designed to affect planned protection behavior and financial investments in an independent investment task. A moral appeals treatment was designed to affect planned protection behavior, such as social distancing, and is published in Bos et al. (2020). Although we also expected an effect of the moral treatment on the coin tossing task, we found no effect. A risk treatment was designed to affect the financial investment task and its results are reported in Bos et al. (2023). The analysis presented here was not pre-registered and is exploratory. Our results here are robust to including the information treatments as control variables for truth-telling behavior (see Table 5 in the Appendix).

As we cannot observe the actual tosses of each respondent, actual cheating is undetectable at the individual level. We can infer the overall level of cheating by comparing the reported distribution of tails with the expected binomial distribution. On the individual level, we further consider two measures of the truth-telling probability: Our first measure of the individual truth-telling probability is having reported ten tails. Our second measure of the individual truth-telling probability is the expected likelihood of having actually obtained the reported number of tails based on the binomial distribution. This likelihood is greater than 20 percent for four, five, and six tails. Both very low and very high numbers of tails are less likely, so reporting a very high or a very low number of tails implies a high likelihood of dishonest behavior.[2]

2.2 Empirical Strategy

To study the link between truth-telling in our survey experiment and later COVID-19 infections, we estimate regressions based on the following baseline specification:

$$y_i = \alpha + \beta T_i + \gamma \mathbf{X}_i + \varepsilon_i \tag{1}$$

where y_i is a binary dummy variable equal to one if respondent i reported a positive test result for COVID-19 in one of our follow-up surveys and zero otherwise. T_i is the truth-telling probability for subject i in March 2020. It is either a binary dummy variable equal to one if respondent i reported ten tails and zero otherwise, or the expected probability to toss the reported number of tails based on the binomial distribution. The vector $\mathbf{X}_i$ includes the following control variables: age, gender, education, monthly household income, the number of household members be-low the age of 18, the number of family members and friends above the age of 60, a binary dummy variable for having health issues, a self-reported measure for financial risk-taking, the share of protective measures taken for others and the perception towards government regulation. We use OLS and Logit estimators to estimate our coefficient of interest β on our pooled panel data. For each model, we calculate robust standard errors.

For our cross-country analysis we consider y_i as the COVID-19 excess death rate in OECD country i, which we calculate by the ratio between the cumulative excess deaths associated with COVID-19 until December 2021 (Msemburi et al., 2023) and the size of a country's population (Mathieu et al., 2023). T_i is the average civic honesty at the country level taken from a field experiment (Cohn et al., 2019), where civic honesty is measured as the share of returned "lost" wallets. $\mathbf{X}_i$ controls for governments' COVID-19 containment policies and the proportion of vaccinated

[2]In studies with observed games under-reporting is relatively rare (see Gneezy et al. (2013, 2018)). In our unobserved setting, we find significantly more reports of 4 and 0 tail tosses as compared to the expected binomial distribution (Binomial test: p-values = 0.000). Barron (2019) argues that under-reporting may serve as a means to appear honest.

population using data from Hale et al. (2021). We use OLS estimators and calculate robust standard errors clustered at the country level.

3 Results

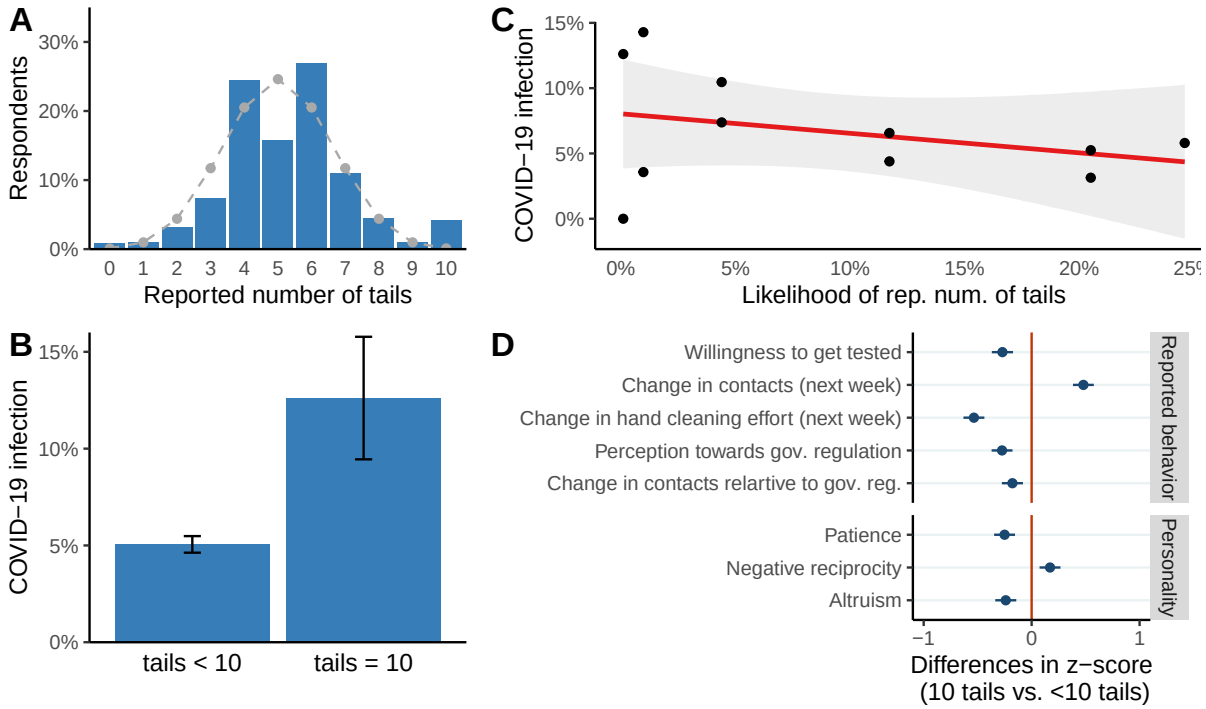
We find evidence that the likelihood of dishonest behavior in the coin-tossing experiment during the first outbreak of the pandemic in Germany predicts later COVID-19 infections. On average, respondents over-report winning coin tosses: the reported distribution differs clearly from the binomial benchmark (Kolmogorov-Smirnov test: $p = 0.000$), which is the distribution of reported tail tosses under full honesty (Fig $1A$). 4.1 percent of respondents reported the maximum number of ten tail tosses, in contrast to the expected value for this occurrence of only 0.1 percent, suggesting that almost all of them misreported winning tail tosses. Among those reporting ten tails in March 2020, 12.6 percent have been infected with COVID-19 until December 2021, while only 5.0 percent of those with less than ten tails reported an infection (Fig $1B$). The difference of almost 8 percentage points is significant, also after including control variables as well as using different regression specifications (Table 1).[3]

We then consider our second measure for the likelihood of dishonest behavior: The expected likelihood of having actually obtained the reported number of tails based on the binomial distribution. We find a negative relationship between the likelihood of reported tails and a later COVID-19 infection (Spearman's rank test: $p = 0.02$, $\rho = -0.05$)). This suggests that respondents who were more likely to report honestly in the experiment were less likely to get infected with COVID-19 and thus be infectious in the 20 months that followed (Fig $1C$). Specifically, the probability of a later COVID-19 infection increases between 0.15–0.19 percentage points for a one percent increase in the likelihood of dishonest behavior in the coin-tossing task (Table 1).

To better understand the link between reporting behavior in the coin toss experiment and later infections with the Coronavirus, we compare preventive health behavior and social preferences between respondents that reported ten tails and those that reported less than ten tails (Fig $1D$) & Table 3). Respondents who reported ten tails are less likely to engage in preventive health behavior, are less altruistic, and tend to act in more negative reciprocal ways. Since respondents with ten tail reports have more contacts, their infection risk is higher than respondents who report less than ten tails. Also, they are more likely to transmit infections, as they are less willing to test themselves and to wash their hands. These observations

[3] As a robustness exercise we use nine and ten tails as well as eight, nine and ten tails as two additional dishonesty measures. We analyze the same models as in Table 1 and also find a significant relationship between these two measures and the likelihood of a COVID-19 infection (see Table 4 in the Appendix).

Figure 1: Dishonesty in our experiment, COVID-19 infections, and personal traits.



Note: (A) The distribution of reported winning tails from ten coin tosses in March 2020 in blue and the expected (binomial) distribution in gray. (B) The share of respondents who reported a later COVID-19 infection for subjects that reported less than and exactly ten tails in March 2020. (C) The relationship between a later COVID-19 infection and the likelihood of reported number of tails. (D) The standardized differences in survey answers between participants who reported 10 tails against those who reported less than 10 tails.

suggest that differences in norm compliance behavior are underlying determinants that affect both behavior in our coin-tossing experiment and in the field.

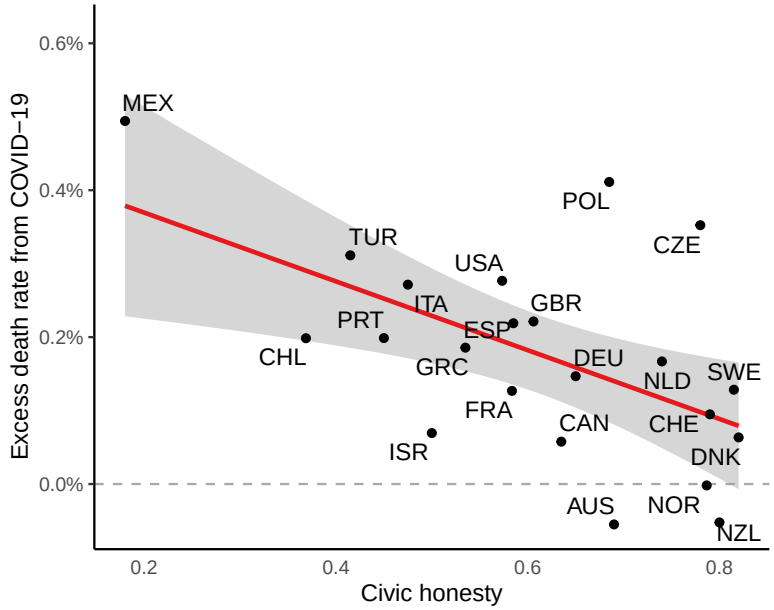
Finally, we find evidence that our findings on dishonesty as a predictor of infectious diseases generalizes across democratic countries. We observe a negative correlation between civic honesty and excess death rates from COVID-19 (Spearman's rank test: p=0.011, ρ=-0.53) (Fig 2). This result suggests that countries with higher civic honesty tend to have a lower excess death rate from COVID-19. The result is robust to controlling for COVID-19 containment policies and the number of vaccinated people in a given country (without controls: β=$-0.47, SE$=0.15, p=0.005; with controls: β=$-0.48, SE$=0.13, p=0.001).

Table 1: COVID-19 infection, ten tail tosses, and likelihood of reported tails.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Reported ten tails	0.08**	0.07**	0.05***	0.04***				
	(0.03)	(0.03)	(0.02)	(0.02)				
Likelihood of coin toss					-0.19***	-0.18**	-0.17***	-0.15***
					(0.07)	(0.07)	(0.06)	(0.05)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Estimator	OLS	OLS	Logit	Logit	OLS	OLS	Logit	Logit
Observations	2723	2723	2723	2723	2723	2723	2723	2723
Mean coronavirus infections	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054

Note: The dependent variable is a binary dummy variable for a positive test for COVID-19 reported between August 2020 and December 2021. For logit models, we report marginal effects. Robust standard errors are shown in parentheses. We report the coefficients of all control variables in Table 2 and find no gender differences in the likelihood of being infected. ** $p < 0.05$, *** $p < 0.01$.

Figure 2: Civic honesty and COVID-19 excess deaths in OECD countries.



4 Conclusion

Our results suggest that experimental measures of dishonesty at the individual and at the country level can be indicators for behavior relevant for the containment of infectious diseases. Individuals who were more likely to misreport their coin tosses to their private advantage were also more likely to be infected with COVID-19 at a later date. Also, at the country level, we find a negative association between civic honesty and COVID-19 excess death rates. Our analysis of survey respondents who reported ten tails shows that they are more likely than respondents who reported less than ten tails to engage in behaviors that increase both the risk of becoming infected and their risk of transmitting the infection to others. We postulate that truth-telling behavior relates to fundamental preferences and traits that determine behavior in economic experiments as well as in the field to affect the spread of infectious diseases.

References

Abeler, J., Becker, A., & Falk, A. (2014). Representative evidence on lying costs. *Journal of Public Economics*, *113*, 96–104.

Abeler, J., Nosenzo, D., & Raymond, C. (2019). Preferences for Truth-Telling. *Econometrica*, *87*(4), 1115–1153.

Barron, K. (2019). *Lying to appear honest* (Tech. Rep.). WZB Berlin Social Science Center, no. SP II 2019-307. Retrieved from `https://bibliothek.wzb.eu/pdf/2019/ii19-307.pdf`

Bavel, J. J. V., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., ... others (2020). Using social and behavioural science to support covid-19 pandemic response. *Nature human behaviour*, *4*(5), 460–471.

Bloom, D. E., Kuhn, M., & Prettner, K. (2022). Modern infectious diseases: Macroeconomic impacts and policy responses. *Journal of Economic Literature*, *60*(1), 85-131.

Bos, B., Drupp, M. A., Meya, J. N., & Quaas, M. F. (2020). Moral suasion and the private provision of public goods: Evidence from the COVID-19 pandemic. *Environmental and Resource Economics*, *76*(4), 1117–1138.

Bos, B., Drupp, M. A., Meya, J. N., & Quaas, M. F. (2023). *Financial risk-taking under health risk* (Tech. Rep.). CESifo Working Paper No. 10387. Retrieved from `https://www.ssrn.com/abstract=4431378`

Cohn, A., Fehr, E., & Maréchal, M. A. (2014). Business culture and dishonesty in the banking industry. *Nature*, *516*(7529), 86–89.

Cohn, A., Maréchal, M. A., Tannenbaum, D., & Zünd, C. L. (2019). Civic honesty around the globe. *Science*, *365*(6448), 70–73.

Drupp, M. A., Khadjavi, M., & Quaas, M. F. (2019). Truth-telling and the regulator. Experimental evidence from commercial fishermen. *European Economic Review*, *120*, 103310.

Gneezy, U., Kajackaite, A., & Sobel, J. (2018). Lying aversion and the size of the lie. *American Economic Review*, *108*(2), 419–453.

Gneezy, U., Rockenbach, B., & Serra-Garcia, M. (2013). Measuring lying aversion. *Journal of Economic Behavior & Organization*, *93*, 293–300.

Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., ... Tatlow, H. (2021). A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker). *Nature Human Behaviour*.

Hsiang, S., Allen, D., Annan-Phan, S., Bell, K., Bolliger, I., Chong, T., ... Wu, T. (2020). The effect of large-scale anti-contagion policies on the COVID-19 pandemic. *Nature*, *584*(7820), 262–267.

Lu, J. G., Song, L. L., Zheng, Y., & Wang, L. C. (2022). Masks as a moral symbol: Masks reduce wearers' deviant behavior in china during covid-19. *Proceedings of the National Academy of Sciences*, *119*(41), e2211144119.

Mathieu, E., Ritchie, H., Rodés-Guirao, L., Appel, C., Gavrilov, D., Giattino, C., ... Roser, M. (2023). *Coronavirus Pandemic (COVID-19)* (Data). Our World in Data. Retrieved from `https://github.com/owid/covid-19-data/tree/master/public/data/vaccinations`

Msemburi, W., Karlinsky, A., Knutson, V., Aleshin-Guendel, S., Chatterji, S., & Wakefield, J. (2023). The WHO estimates of excess mortality associated with the COVID-19 pandemic. *Nature*, *613*(7942), 130–137.

Quaas, M. F., Meya, J. N., Schenk, H., Bos, B., Drupp, M. A., & Requate, T. (2021). The social cost of contacts: Theory and evidence for the first wave of the covid-19 pandemic in germany. *PLoS One*, *16*(3), e0248288.

Tobol, Y., Siniver, E., & Yaniv, G. (2020). Dishonesty and mandatory mask wearing in the covid-19 pandemic. *Economics letters*, *197*, 109617.

5 Appendices

5.1 Tables

Table 2: COVID-19 infection, ten tail tosses, and likelihood of reported tails with control variables.

	(1)	(2)	(3)	(4)
Reported ten tails	0.067**	0.042***		
	(0.031)	(0.015)		
Likelihood of coin toss			-0.175**	-0.151***
			(0.070)	(0.055)
Age in years	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Female (1=yes, =0)	-0.001	-0.001	-0.002	-0.002
	(0.009)	(0.009)	(0.009)	(0.009)
Education	0.002	0.001	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)
Household income	0.006	0.007	0.006	0.007
	(0.004)	(0.005)	(0.004)	(0.005)
Number of HH members > 18 years	0.023***	0.018***	0.023***	0.018***
	(0.007)	(0.005)	(0.007)	(0.005)
Friends > 60 years	-0.002***	-0.003**	-0.002***	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Health issue	0.021**	0.020**	0.021**	0.020**
	(0.010)	(0.010)	(0.010)	(0.010)
Protective measures taken for others	0.001**	0.001**	0.001**	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
Perception gov. regulation	-0.004*	-0.004*	-0.004*	-0.004*
	(0.002)	(0.002)	(0.002)	(0.002)
Willingness financial risk	0.003	0.003	0.003	0.003
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	-0.016		0.016	
	(0.034)		(0.035)	
Controls	Yes	Yes	Yes	Yes
Estimator	OLS	Logit	OLS	Logit
Observations	2723	2723	2723	2723
Mean coronavirus infections	0.054	0.054	0.054	0.054

Note: The dependent variable is a binary dummy variable for a positive test for COVID-19 reported between August 2020 and December 2021. The independent variables are based on responses in March 2020. In Columns (1) and (2), we estimate the difference in the average COVID-19 infection rate between respondents reporting ten tails and those reporting less than ten tails. In Columns (3) and (4), we regress the expected likelihood that the reported coin toss is true (based on binomial distribution) on a respondent's COVID-19 infection status. For the Logit models we report marginal effects. Robust standard errors are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Reported behavior and personal traits of participants who reported ten tails.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Willingness to get tested	Change in contacts (next week)	Change in hand cleaning effort (next week)	Perception towards gov. regulation	Change in contacts relative to gov. reg.	Patience	Negative reciprocity	Altruism
Reported ten tails	-0.231**	0.490***	0.493***	-0.248**	-0.147	-0.164	0.188*	-0.222**
	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)
Constant	0.009	-0.019	0.019	0.010	0.006	0.006	-0.007	0.009
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Observations	2,675	2,675	2,675	2,675	2,675	2,675	2,675	2,675

Notes: This table presents the results of ordinary least square regressions. Dependent variables are standardized to z-scores. The sample includes only respondents without missing values in all dependent variables. We observe that respondents who reported ten tails had a lower willingness to get tested, planned to have more social contacts in the week after participating in our survey, wanted to engage in less effort to wash their hands and perceived governmental norms as too strict. Compared to governmental norms, respondents who reported ten tails tend to reduce social contact less than respondents who reported less than ten tails, but this difference is not significant. Likewise, we detect no significant difference between their patience levels, and a weakly significant difference suggesting that respondents with ten tails act in more negatively reciprocal ways. Finally, we observe that respondents with ten tails are less altruistic. Robust standard errors are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Positive corona test and high number of tail tosses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Reported nine or ten tails	0.057**	0.050*	0.041***	0.034**				
	(0.027)	(0.026)	(0.015)	(0.015)				
Reported eight, nine or ten tails					0.042**	0.037**	0.034***	0.028**
					(0.018)	(0.018)	(0.012)	(0.012)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Estimator	OLS	OLS	Logit	Logit	OLS	OLS	Logit	Logit
Observations	2723	2723	2723	2723	2723	2723	2723	2723
Mean coronavirus infections	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054

Note: The dependent variable is a binary dummy variable for a positive test for COVID-19 reported between August 2020 and December 2021. For logit models we report marginal effects. Robust standard errors are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Positive corona test, truth-telling probability, ten tail tosses and treatments.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Reported ten tails	0.076**	0.067**	0.051***	0.042***				
	(0.032)	(0.031)	(0.015)	(0.015)				
Likelihood of coin toss					-0.195***	-0.177**	-0.175***	-0.153***
					(0.071)	(0.070)	(0.055)	(0.055)
Risk info-treatment	0.004	0.003	0.004	0.003	0.004	0.004	0.004	0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Moral info-treatment	-0.002	-0.003	-0.002	-0.003	-0.002	-0.003	-0.002	-0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Estimator	OLS	OLS	Logit	Logit	OLS	OLS	Logit	Logit
Observations	2723	2723	2723	2723	2723	2723	2723	2723
Mean coronavirus infections	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054

Note: The dependent variable is a binary dummy variable for a positive test for COVID-19 reported between August 2020 and December 2021. For logit models we report marginal effects. Robust standard errors are shown in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5.2 Study questionnaire

Translation from German Version

Scientific Study of the Universities Leipzig and Hamburg

Dear Ladies and Gentlemen,

You are cordially invited to participate in a **scientific study** conducted by the Universities of Leipzig and Hamburg.

The study aims to contribute to a better understanding of individual behavior and economic impacts related to the spread of the coronavirus.

In our study, we ask you to answer **24** short questions and complete 2 tasks where you can earn a small amount of extra money. Participation in the **study will take around 10 minutes** and you **can earn up to €4.50** (450 mingle points) **extra**.

We will only use the **anonymized data** in our scientific studies. We will make the results of the scientific evaluation available to the general public.

We very much hope that you will take part in the study. If you have any questions, please feel free to contact us at any time. By clicking on "Continue" you give your consent to take part in the study.

Thank you in advance for your participation,

Prof. Dr. Martin Quaas
martin.quaas@idiv.de

Dr. Jasper Meya
jasper.meya@idiv.de

Prof. Dr. Moritz Drupp
Moritz.Drupp@uni-hamburg.de

Björn Bos
bjoern.bos@uni-hamburg.de

PAGEBREAK

1. In which year were you born? _____
2. What is your gender? □ male □ female □ non-binary
3. What is the zip-code of your home? _____
4. What is your level of education?
    - University degree
    - High school diploma
    - Secondary school certificate
    - Secondary school/ elementary school
    - No school-leaving qualification
    - Other (please specify): _____

PAGEBREAK

5. 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)? _____
    - How many of them are over 60 years old? _____
6. How many people live in your household? (please include yourself) _____
    - How many people in your household are children under the age of 18? _____
    - How many people in your household are older than 60 years? _____
7. What is your monthly net household income (the remuneration of all household members, after deduction of taxes and social securities)?

    □ Less than 1.500€ per month

    □ 1.500 to 3.000€ per month

    □ 3.000 to 4.000€ per month

    □ More than 4.000€ per month

PAGEBREAK

2

(Risk Treatment, randomized)

(A) Baseline

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.

(B) **High-risk framing**

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.

(C) **Low-risk framing**

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.

3

PAGEBREAK

8. To what extent do you experience the emotion “fear” at the moment?

not at all						very strong
0	1	2	3	4	5	6

9. What do you expect approximately how your annual income will change in the current year 2020 compared to 2019? (in percent)

Reduction to 1/10		Halves		Decreases by 10%		Decreases by 1%	No change	Increase by 1%		Increase by 10%		Doubles		Tenfold increase

PAGEBREAK

10. Please tell us: How willing are you to take risks with regard to your finances?

not willing at all		rather not willing			neither			rather willing		very willing
0	1	2	3	4	5	6	7	8	9	10

11. Please tell us: How willing are you to take risks regarding your health?

not willing at all		rather not willing			neither			rather willing		very willing
0	1	2	3	4	5	6	7	8	9	10

PAGEBREAK

Task 1

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

How many Euro-Cent would you like to invest (0 - 100)? _____ Euro-Cent

PAGEBREAK

We would now like to ask you some questions about your health state and the consequences of an infection with the coronavirus.

PAGEBREAK

12. Do you have one or more of the following diseases?
    - Heart disease
    - Lung disease
    - Liver disease
    - Diabetes
    - Cancer
    - Weakened immune system

    [yes, no]

13. Have you already fallen ill with the coronavirus??
    - yes, no, maybe, do not know

PAGEBREAK

14. *(14a) Filter if "No", "Maybe" or "No answer" in Question 13:*

    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?

not willing at all		rather not willing			neither			rather willing		very willing
0	1	2	3	4	5	6	7	8	9	10

PAGEBREAK

15. *(15a) Filter if "No", "Maybe" or "No answer" in Question 13:*
    - How likely do you think it is that you will become infected with the coronavirus or that you have already been infected?

impossible		rather unlikely			likely			rather likely		for sure
0	1	2	3	4	5	6	7	8	9	10

    - How likely do you think it is that if you are infected, you will only get sick mildly?

impossible		rather unlikely			likely			rather likely		for sure
0	1	2	3	4	5	6	7	8	9	10

- How likely do you think it is that if you are infected, you will be in acute danger of death in case of infection?

impossible		rather unlikely			likely			rather likely		for sure
0	1	2	3	4	5	6	7	8	9	10

(14b) Filter if "Yes" in Question 13:

Have you recovered after the corona infection?

- yes, no, no answer

PAGEBREAK

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 meters to other people.

15. Compared to the same week last year, by what percentage have you reduced or increased your physical, social contacts this week?

Reduction to zero		Reduction to 1/100		Reduction to 1/10		Halved		Decrease by 10%		Decrease by 1%	No change	Increase by 1%		Increase by 10%

16. 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?

Reduction by 10%		Reduction by 1%	No change	Increase by 1%		Increase by 10%		Doubled		Tenfold increase		Fifty-fold increase		Increased a hundredfold

7

PAGEBREAK

17. 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%]

PAGEBREAK

8

(Treatment Moral Appeal, randomized!)

(A Control):

(B Deontological ethics):

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 your personal actions are suited to break chains of infection and whether the pandemic would be contained if everyone acts like you.”

Please enter here the word that is underlined in Dr. Kellner's appeal: _____

(C Consequentialist ethics):

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, 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.”

Please enter here the word that is underlined in Dr. Kellner's appeal: _____

PAGEBREAK

We would now like to know what you are planning for the coming week:

18. Compared to the same week last year, by what percentage will you reduce or increase your physical, social contacts in the coming week?

Reduction to 1/10		Halving		Decrease by 10%		Decrease by 1%	No change	Increase by 1%		Increase by 10%		Doubling		Tenfold increase

19. 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?

Reduction to 1/10		Halving		Decrease by 10%		Decrease by 1%	No change	Increase by 1%		Increase by 10%		Doubling		Tenfold increase

PAGEBREAK

We would now like to know to what extent you agree with the following statements.

20. The current government measures to contain the corona pandemic are…

way too much		go too far			are appropriate			are too little		are way too little
0	1	2	3	4	5	6	7	8	9	10

21. Relative to the governmental regulations, I will limit my physical, social contacts as follows:

participate in Corona-Parties		considerably less than prescribed			according to regulations			considerably more than prescribed		complete avoidance of all contacts
0	1	2	3	4	5	6	7	8	9	10

10

PAGEBREAK

Task 2

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: [____]

PAGEBREAK

Please answer the following questions:

22. 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?

not willing at all		rather not willing			neither			rather willing		very willing
0	1	2	3	4	5	6	7	8	9	10

23. How much would you be willing to punish someone who treats others unfairly, even if there may be costs for you?

not willing at all		rather not willing			neither			rather willing		very willing
0	1	2	3	4	5	6	7	8	9	10

24. How much would you be willing to give to a good cause without expecting anything in return?

not willing at all		rather not willing			neither			rather willing		very willing
0	1	2	3	4	5	6	7	8	9	10

PAGEBREAK

Do you have any other comments you would like to share with us?

Finally, please click on "**End study**" at the bottom right.

By clicking on "End study", you declare that you have voluntarily participated in the scientific study and that you agree to my anonymized data being used for the stated purposes of the scientific study.

Thank you very much for your participation!

Prof. Dr. Martin Quaas
martin.quaas@idiv.de

Dr. Jasper Meya
jasper.meya@idiv.de

Prof. Dr. Moritz Drupp
Moritz.Drupp@uni-hamburg.de

Björn Bos
bjoern.bos@uni-hamburg.de

[End study]

12