Moral Nudging During the Covid Pandemic

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Abstract

We study moral nudges and their impact on pro-social behavior. To promote Corona Tracing App use by sharing social information, subjects may pay for sending a recommendation message to peers. We vary information that people receive regarding the willingness to pay of others, prior to making their own choice. Does this nudge influence people's pro-social behavior? We collect data in two distinct occasions during a particular grave pandemic phase with high daily death rates in Germany. Does the prolonged crisis mode trigger additional motivation to incur personal costs for the common benefit? Our results emphasize the effectiveness of Moral Nudges. Subjects receiving a social message pay more for sending one themselves. While willingness to pay is slightly elevated during the second round of elicitation, we find no significant effect in that regard. Motives to pay as stated by subjects reveal a pattern hinting at potential explanations.

JEL Classification: I12, D9, D64, C90

Keywords: Health Behavior, Nudge, Online Experiment, Pro-Social Behavior

1 Introduction

The period between December 2020 and February 2021 saw a highly dynamic development of the Covid pandemic in Germany. In particular, the 3rd and 4th infection wave took hold of the country with peaking confirmed case numbers in late December and mid-January, respectively. Confirmed Covid-19 deaths rose up to numbers of over 850 *per da*y in the early days of January 2021 (Ritchie et al. 2020). Very few people had gotten an opportunity to receive a Covid vaccination at that time. While vaccination efforts began during the last days of December 2021, initial supplies were severly limited and in no way sufficient to meet the enormous demand. On February 28, 2021, the statistics counted only around 2.6% of the population as fully vaccinated according to the initial vaccination protocol (Ritchie et al. 2020). During this period, media outlets reported extensively and on a daily basis the exceptional burdens that the health care system had to bear.

We set out to answer how these developments have affected the effectiveness of a moral message nudge aimed at promoting Contact-Tracing-App (CTA) use. We test if, and to what extent, Moral Nudges can present themselves as an effective and cost-efficient instrument in aiming to promote pro-social health behavior. As use case, we choose CTA use as it exhibits distinct properties of public good provision.

We further test whether a positive relationship between prolonged duration of the exceptional situation and the individual willingness to contribute to the common good exists. We study these questions in an incentivized online study and find evidence that supports the effectiveness of moral nudges. Although, willingness to pay was higher in the data collected in February 2022 compared to the *December* sample, this difference is not significant. A potential explanation lies in a shift of motives that generated higher pro-social spending.

This article is structured as follows: Section 2 sketches our experimental design. Section 3 lays out our hypotheses, and section 4 states the outcomes of the online experiment. Section 5 concludes.

2 Experimental Design

We ran an online study at the KD2Lab in Karlsruhe which is part of the Karlsruhe Institute of Technology. We ran our survey and decision tasks with the help of the SoSci Survey framework. E-mail invitations to participate in the study were sent out to members of the lab's subject pool with KD2Lab's hroot software (Bock et al. 2014). The invitation already notified receivers that a smartphone would be necessary to take part. We collected data in two separate rounds. The first ran in December 2020 and the second one in February 2021. In the end, decisions of 709 subjects were analyzed, after we excluded persons who multi-switched in our multiple pricelist format (see below).

In the beginning of the study, we instructed subjects with payout modalities. In particular, upon completion of the study, a computer would randomly select those subjects who would receive payoff and whose decisions would be implemented. Of the three incentivized parts of the study, one would be randomly picked to be implemented. Employing a multiple price list format (Anderson et al. 2007), we elicited willingness to pay for sending a message to peers that recommends using the COVID-19 tracing app. Subjects were able to choose whether they send a message to another person or to receive a pay-off for themselves with monetary amounts ranging from 0.01 EUR up to 20 EUR. Before subjects made their choice, they would receive one of our treatment messages themselves if they had been randomly sorted into one of the treatment groups. Subjects in the control group received no message previous to their own decision. The content of the treatment message contained information on another subject's willingness to pay for sending a recommendation message. Between treatment groups, the extent of the observed willingness to pay varied.

We further elicited normative expectations for scenarios of high moral relevance in the Covid pandemic context. We employed the widely applied and tested approach of the incentivized method introduced by Krupka & Weber (2013) to that end. The first scenario sketched a triage decision: Two persons A and B are in dire need of a ventilator after contracting COVID-19. Only one ventilator is available, however. We asked participants' assessment of moral appropriateness if person A receives preferential treatment, given different contexts. In the first set of circumstances, person A – as opposed to person B – had publicly repudiated using the COVID-19 tracing app. In the second case, person A – as opposed to person B – had declined a widely available and strongly recommended opportunity to get vaccinated. Both of these sets of circumstances were identically applied to the second scenario that focused on costs arising for the public health care system as a consequences of treating COVID-19 patients. Specifically, we asked about the moral appropriate ness of public health insurances to invoice (part of the) treatment costs to the transgressing person A. According to the idea of Krupka & Weber's method (2013), subjects were incentivized to correctly assess the modal response between themselves and the other subjects in the study. Moral appropriateness would be expressed in the form of a 4-point-Likert scale with corresponding ratings "morally very inappropriate", "morally somewhat inappropriate", "morally somewhat

appropriate“ “morally very appropriate“. To analyze outcomes, we transformed these categories to numerical values of –1, –1/3, 1/3, and 1, respectively.

In a third incentivized decision task, we employed an approach based on Holt & Laury (2002) to elicit individual risk preferences.

3 Background & Predictions

Digital Contact Tracing promises to deliver significant value in mitigating the spread of an infectious disease, as vast research with regard to Covid shows (Wymant et al. 2021, Abueg et al. 2021). Contact Tracing Apps work even when usage rates in the population are rather low (Lopez et al. 2021). To put this instrument to its most effective use, however, researchers suggest to combine it with other interventions and to convince as many people as possible to make use of the app (Aleta et al. 2020, Almagor & Picascia 2020, Kucharski et al. 2020). From the individual citizen's point of view, using the CTA equals a public good contribution. The benefits DCT provides – as, e.g., decreased spread of infections – are accessible to anyone in the population. While users bear considerable privacy costs (Grekousis & Liu 2021), the app sends alerts only after risky contact with a positive tested person took place. In effect, the clear individual costs are in contrast to only marginal individual benefits. While several factors come into play (Kaptchuk et al. 2020), the willingness of people to adopt CTA use is directly related to people's willingness to share personal data (Schudy & Utikal 2017, Preibusch et al. 2013, Benndorf et al. 2015, Beresford et al. 2012). Researchers have enjoyed mixed success in employing informational nudges and a more classical approach of monetary incentives in order to boost CTA uptake and counteract underprovision of this public good (Munzert et al. 2021). In this context, we, too, set out to study nudges which have garnered much public attention in recent years (Benartzi et al. 2017).

Our focus is on studying the effectiveness of so-called *moral* nudging which amplifies observability of altruistic and pro-social behavior. The idea is that observing others who engage in pro-social acts, triggers a similar motivation in observers. In fact, research backs up this effect (Capraro et al. 2019, Capraro & Marcelletti 2015) and there are several rationales to explain its origins of which we lay out the most relevant below. It is important to note already the outsized and growing role social information and informational cascades play in today's attention economy.

The origins of human cooperation remain an open question in science (Nowak et al. 2004, Nowak 2006), but researchers have proposed several approaches that encourage contributions to common goods by individiuals. One of those factors concerns the conditionality of contributions (Fischbacher et al. 2001). Reischmann & Oechssler (2018) and Oechssler et al. (2020) present mechanism based on conditional contribute that facilitate cooperation in public goods games. Nudges – which are defined as „any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives." (Thaler & Sustein 2008) – may be able to take advantage of this mechanism in a similar way.

One related approach is the practice of employing social norm interventions to nudge people to adhere to the norms presented. This has been widely studied and produced successful outcomes for a broad range of issues (Kraft-Todd et al. 2015, Krupka & Weber 2013, Hallsworth et al. 2017, Bicchieri & Dimant 2019, Pruckner & Sausgruber 2013). Our design is informed by this line of research but even more closely based on studies that examine social information and social influence when the observed behavior is not necessarily recognizable as the prevalent norm but

merely an individual observation. It is promising to see for policy-makers and behavioral scientists that – also under these circumstances – social proof can indicate a morally appropriate course of action. It may also remind observers of a moral obligation and thus prevent them from ignoring it. Plenty of empirical evidence suggests pro-social behavior to be contagious in many contexts (Sisco & Weber 2019, Centola 2010, Bond et al. 2012). Researchers leveraged this insight to nudge (pro-social) behavioral cascades with the help of moral messages (Fowler & Christakis 2010).

There is another perspective that lends itself to illuminate the link between observing pro-social behavior and the proclivity to follow that example. This perspective emphasizes the informational value of observing other people's behavior, even absent any moral considerations. In an ever-present state of ambiguity regarding the eventual outcome of different decision options, people tend to look for any informational cues to inform their own choice. The behavior of others who faced the exact same choice options can, thus, serve as a strong signal – especially is the incurred costs are explicitely stated (Milgrom & Roberts 1986). Following that logic, observing the fact that others pay a certain amount to send a recommendation message represents a costly signal to receivers regarding the unknown value of opting to send. This can be of particular relevance where indiviudals lack other informational cues or anchors to determine an appropriate price.

While we present different frameworks to explain underlying mechanisms, the presented empirical evidence decisively points in a common direction and culminates in our first hypothesis:

H1 *Moral behavior increases when subjects observe other people's moral behavior.*

We assume the prolonged state of crisis to affect people's perception in a way that makes the societal costs of the ongoing pandemic more salient to them. If this is the case, it appears a rational to invest more in a public good that can curb these costs. Even if people do not act fully rational, or if the public benefit is not clearly elevated during the second round of elicitation, people often rely on the availability heuristic (Kahneman et al. 1982, Kahneman & Frederick 2002) in similar contexts (Sunstein 2006). Both considerations lead us to formulate our second hypothesis as follows:

H2 *Moral behavior is more prevalent in the second round of elicitation as opposed to the first.*

4 Results

Analyzing a pooled sample of December 2020 and February 2021 observations, we find in treatment groups, as well as under control conditions, people choosing to pay considerable amounts for sending recommendations. Subjects not receiving a message before making their decision (i.e., those in the control group), are on average willing to pay 3.95 EUR. Subjects randomly allocated to one of the treatments groups receiving either a *1cent, 2EUR, 10EUR,* or *20EUR* message, were on average willing to pay 5.95 EUR to recommend app use by sending a message. This difference between treatment and control condition equals a relative increase of more than 50%. Examining *1cent, 2EUR, 10EUR, 20EUR* treatment individually for this pooled sample, reveals that each of the messages has a statistically as well as economically significant effect on willingness to pay (Wilcoxon rank-sum test: p=0.0179 *1 cent message*, p<0.01 respectively for the other three treatments), as figure 1 displays. The *10EUR message* registers the largest impact – resulting in an average willingness to pay of 6.58 EUR. This is a relative increase of more than 66% as compared to control conditions. Interestingly, the very low observed cost of 1 cent, still produces a large impact. Variation in willingness to pay between the four treatment conditions ranges from 5.48 EUR to 6.58 EUR. Those differences turn out not to be statistically significant (Wilcoxon rank-sum test).

Result 1 *We find strong evidence in support of hypothesis H1.*

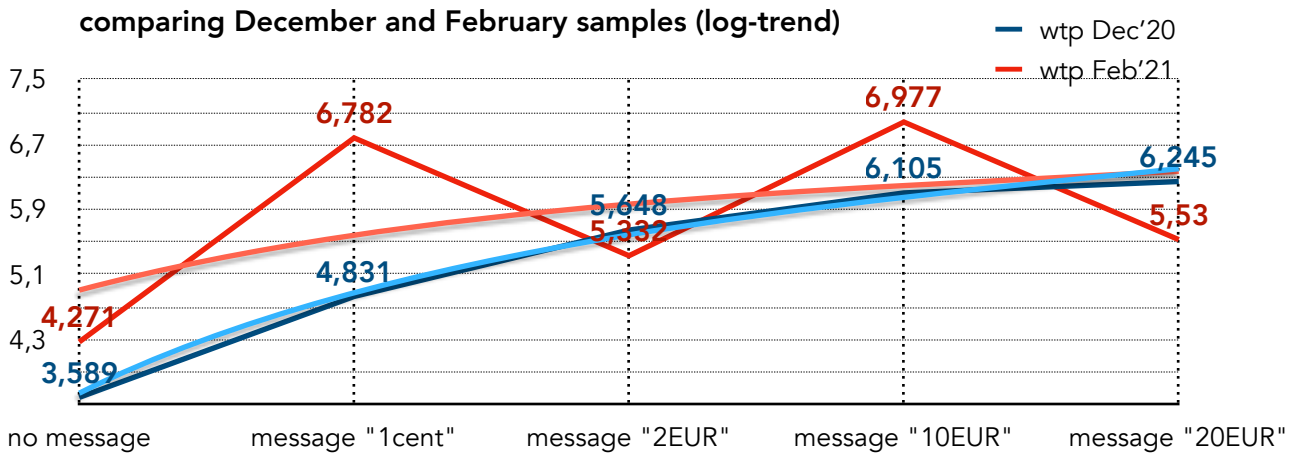

Figure 1. Receiving a moral nudge increases willingness to pay for sending.

Examining the two rounds of elicitation separately yields a similar picture (see figure 1). The average willingness to pay in the *December* sample is 5.28 EUR (N=324), whereas it amounts to 5.78 EUR (N=385) in the February sample. This difference, however, is not statistically significant (Wilcoxon rank-sum test). It equals an average difference of roughly 50 cents and a relative increase of around 9.4%. In both samples, the total share of subjects who state they had not installed the app on their phone was very similar in both samples (23% v. 24.4%). This is relevant to rule out a biased estimation of effects as the response to this question presents itself as reliable

predictor of an individual's willingness to pay. See the appendix for more details. We further find no significant treatment effects on social norm expectations. Normative expectations further appear quite robust between the two elicitation rounds.

Result 2 *We must reject hypothesis H2 based on the collected data.*

Turning to explanations for a potentially increased willingness to pay in the *February* sample, we analyze the statements given by subjects in response to the questions why they would be willing to pay for sending a recommendation and which impact they attribute to the Corona Tracing App. Responses were independently categorized into distinct pre-defined categories on two different instances. Only those categorizations that matched were subsequently included to the analysis (see table 1). On the side of endorsing CTA use, we note an increased appreciation of collective benefits in absolute numbers of responses in that category from 43/324 in December to 129/385 in Febraury. These numbers equal shares of 13.3% and 33.5%, respectively. We record a similar and pattern with regard to mentioning individual benefits which increases from 15/324 to 101/385. From 4.6% to 26.2% of total responses, that is. When we turn to responses that argue against paying for a recommendation and/or against the value of the CTA, we additionally find that concerns about the app's functionality decrease between December and February from 27/324 (8.3%) to 15/385 (3.9%) of total responses. Figure 2 displays the shares of stated motives after separating arguments in favor on one side from arguments against and ambiguous responses on the other side.

category	*title*	*description*
PRO	**individual benefits**	Answers referring to individual & private utility for the user, e.g., that the app enables informed decision-making or provides ease of mind.
PRO	**collective benefits**	Answers referring to „public benefits and the common good, e.g., the app's potential to support health authorities with contact tracing"
PRO	**network effects**	Answers referring to the fact that „the app is especially effective when many people use it."
AGAINST	**functionality**	Answers translating roughly to „The functionality of the app is not sufficient to be an effective tool."
AMBIGUOUS		Answers categorized as „containing contradictory arguments"/„ not containing a substantial argument"/ „containing substantial arguments beyond the previously specified categories"

Table 1. Categorization of responses to different motives.

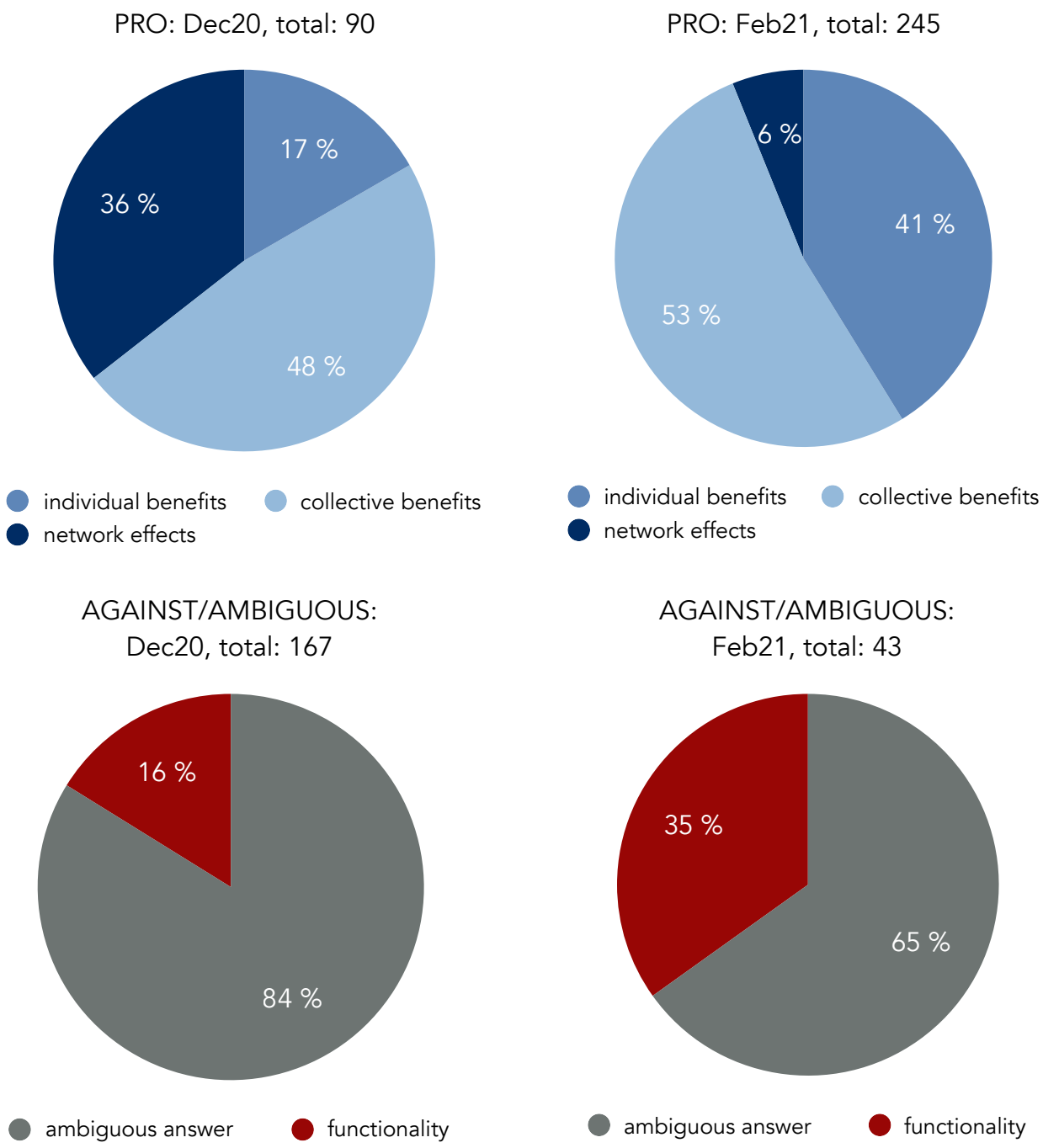

Figure 2. Stated motives to pay, comparing *December 2020* & *February 2021*, after separating PRO-arguments from other (AGAINST/AMBIGUOUS).

Stated motives for and against sending a recommendation message (as response to an open form question). We had the answers independently sorted into a corresponding category and present the result for matching categorizations (545 of 709). Non-matching were in Dec'20 sample: 67 and in Feb'21 sample 97.

5 Conclusion

Moral nudges can play an effective role in promoting certain health behaviors on the individual level. They are useful instruments to policymakers, especially in times of immediate health crises, and especially with regard to promoting behaviors that contain a clear aspect of pro-sociality. Both contexts apply to the case of Contact Tracing Apps during the Covid pandemic. We find that our intervention based on short text messages that apply moral nudges raises individual willingness to pay for sending a recommendation message to others. Our study reiterates the outsized sway that social influence holds on behavior. We employ this insight in a way that is easily implementable in many policy settings as such moral nudges can be integrated in already existing communication. Even a very slight nudge – as illustrated in the *1 cent* treatment of our study design – promises significant behavioral change. Moreover, the effect appears to remain robust over considerable amount of time even in a highly dynamic environment.

We urge policy-makers and (health) officials to incorporate these and related behavioral insights into their decison-making. Setting a good example can go a long way an inspire observers to pay attention to their own moral behavior. A promising task for future studies lies in unwrapping the motives and mechanisms underlying these effects. We present initial insight into rationales of people to act pro-social with regard to the Contact Tracing App. More research along those lines could illuminate these interconnections further.

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Appendix

A. Social Norm vignettes

A.1.Triage

A.2.Medical Costs

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Szenario „Behandlungskosten“

Nehmen Sie bitte an, Person A erkrankt am Coronavirus und wird behandelt. Als **Mitglied der gesetzlichen Krankenversicherung** werden Person As Behandlungskosten – basierend auf dem **Solidaritätsprinzip** – zunächst vollständig von der Krankenkasse gezahlt.

Weiter

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Inwieweit wäre es moralisch angemessen, dass die gesetzliche Krankenkasse von Person A eine Selbstbeteiligung an den Behandlungskosten einfordern könnte, wenn

a) Person A sich nachweislich und öffentlich gegen die Nutzung der Corona-Warn-App eingesetzt hat?

- moralisch sehr unangemessen
- moralisch eher unangemessen
- moralisch eher angemessen
- moralisch sehr angemessen

Weiter

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Inwieweit wäre es moralisch angemessen, dass die gesetzliche Krankenkasse von Person A eine Selbstbeteiligung an den Behandlungskosten einfordern könnte, wenn

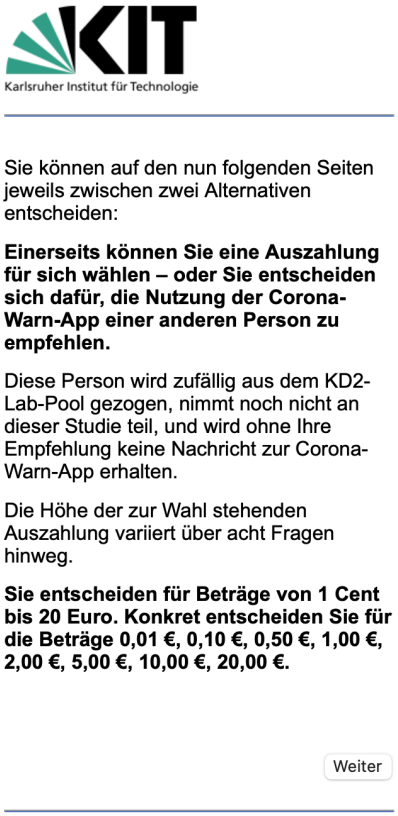
b) Ein zugelassener Impfstoff allgemein verfügbar ist – wobei die Impfung dringend empfohlen, aber nicht verpflichtend ist – und Person A sich gegen eine Impfung entschieden hat?

- moralisch sehr unangemessen
- moralisch eher unangemessen
- moralisch eher angemessen
- moralisch sehr angemessen

Weiter

B. Experimental Interface

B.1. Example screenshots of the instructions and a decision 0,01 EUR vs recommendation



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Sie können auf den nun folgenden Seiten jeweils zwischen zwei Alternativen entscheiden:

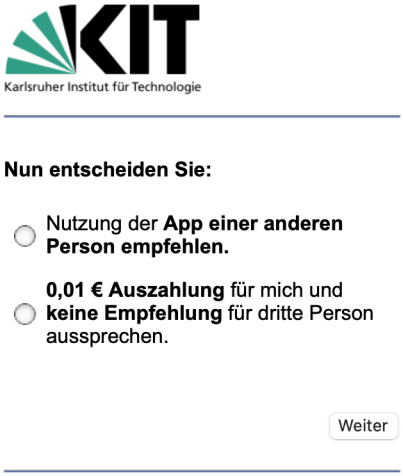
Einerseits können Sie eine Auszahlung für sich wählen – oder Sie entscheiden sich dafür, die Nutzung der Corona-Warn-App einer anderen Person zu empfehlen.

Diese Person wird zufällig aus dem KD2-Lab-Pool gezogen, nimmt noch nicht an dieser Studie teil, und wird ohne Ihre Empfehlung keine Nachricht zur Corona-Warn-App erhalten.

Die Höhe der zur Wahl stehenden Auszahlung variiert über acht Fragen hinweg.

Sie entscheiden für Beträge von 1 Cent bis 20 Euro. Konkret entscheiden Sie für die Beträge 0,01 €, 0,10 €, 0,50 €, 1,00 €, 2,00 €, 5,00 €, 10,00 €, 20,00 €.

Weiter



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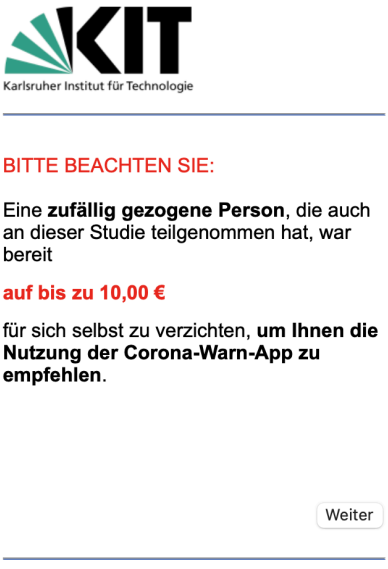
Nun entscheiden Sie:

- Nutzung der **App einer anderen Person empfehlen.**
- **0,01 € Auszahlung** für mich und **keine Empfehlung** für dritte Person aussprechen.

Weiter

B.2. Example screenshot for a norm nudge „10EUR message" treatment



Karlsruher Institut für Technologie

BITTE BEACHTEN SIE:

Eine **zufällig gezogene Person**, die auch an dieser Studie teilgenommen hat, war bereit

auf bis zu 10,00 €

für sich selbst zu verzichten, **um Ihnen die Nutzung der Corona-Warn-App zu empfehlen**.

Weiter

C. Balance of the sample over treatments (gender, age, CTA app installed?, risk preference)

	complete sample	(0)	(1)	(2)	(3)	(4)	ttest, p-value			
norm (treatment)		**control**	**1cent**	**2EUR**	**10EUR**	**20EUR**	**(0) vs (1)**	**(0) vs (2)**	**(0) vs (3)**	**(0) vs (4)**
male	0,595	0,56	0,63	0,62	0,59	0,58	0,13	0,17	0,32	0,35
age	24,56	24,82	24,46	24,63	23,98	24,91	0,27	0,38	**0,03**	0,42
app_installed	0,76	0,70	0,77	0,79	0,77	0,78	0,1	0,06	0,09	0,08
risk attitude (safe choices)	5,15	5,06	5,05	5,36	5,20	5,09	0,48	0,20	0,26	0,45
N	709	142	140	142	141,00	144				

D. Correlations with social norm expectations (linear regression)

D.1.Overview

indenpendent vars	**dependent vars**				
	willingness to pay	**(Triage & AntiApp)**	**(Triage & AntiVax)**	**(Cost & AntiApp)**	**(Cost & AntiVax)**
(variable name in output)	wtp	kw1a	kw1b	kw2a	kw2b
app_installed = „no"	**– –**	O	**„more lenient"**	O	**„more lenient"**
gender = „male"	**– –**	O	O	O	O
treatments	**++**	O	O	O	O
sample=„Feb21"	O	O	O	**„more lenient"**	O

D.2. Regression outputs

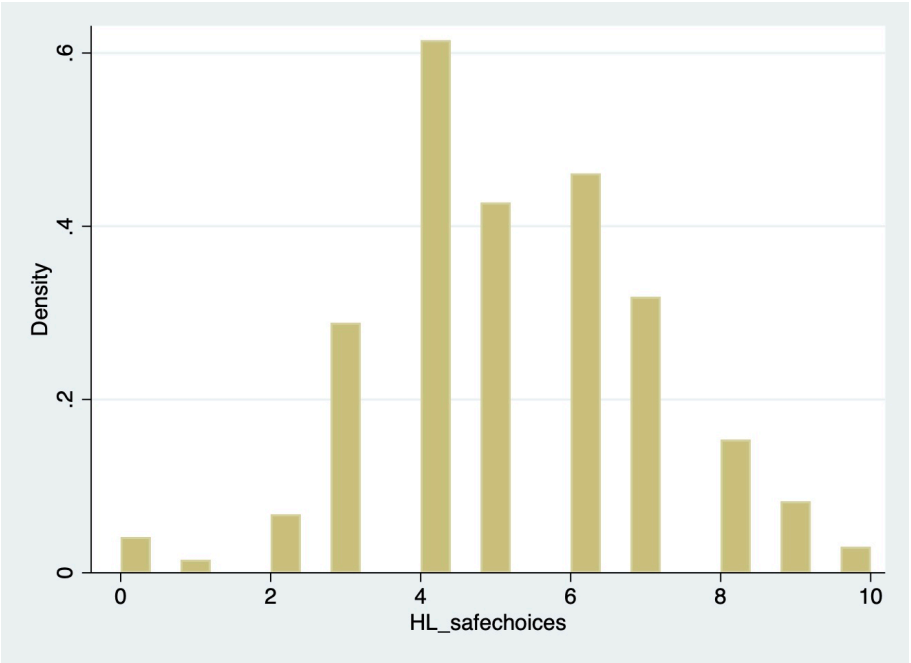
```
2 . mvreg
```

Equation	Obs	Parms	RMSE	"R-sq"	F	P
wtp	**705**	**9**	**6.123351**	**0.0455**	**4.148014**	**0.0001**
kw1a	**705**	**9**	**.4241588**	**0.0044**	**.3886137**	**0.9269**
kw1b	**705**	**9**	**.4924955**	**0.0171**	**1.515781**	**0.1480**
kw2a	**705**	**9**	**.5932506**	**0.0280**	**2.502061**	**0.0110**
kw2b	**705**	**9**	**.6434915**	**0.0253**	**2.254336**	**0.0221**

		Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
wtp							
	app_installed						
	Nein	**-1.950069**	.5441274	-3.58	**0.000**	-3.018396	-.8817407
	norm						
	Norm_1cent	**1.932397**	.7323033	2.64	**0.009**	.4946087	3.370185
	Norm_2EUR	**1.334762**	.7338371	1.82	0.069	-.106038	2.775562
	Norm_10EUR	**2.570787**	.7306039	3.52	**0.000**	1.136335	4.005239
	Norm_20EUR	**1.832583**	.7264919	2.52	**0.012**	.4062046	3.258961
	nsample						
	Feb21	**.6291943**	.4635874	1.36	0.175	-.2810032	1.539392
	gender						
	männlich	**-.9397367**	.4708419	-2.00	**0.046**	-1.864177	-.0152959
	weder noch, sondern (opt..	-2.381332	3.560166	-0.67	0.504	-9.371285	4.608622
	_cons	4.66591	.6485815	7.19	0.000	3.392499	5.93932
kw1a							
	app_installed						
	Nein	-.0107598	.0376912	-0.29	0.775	-.0847619	.0632422
	norm						
	Norm_1cent	.055807	.050726	1.10	0.272	-.0437872	.1554013
	Norm_2EUR	.0270003	.0508322	0.53	0.595	-.0728025	.1268032
	Norm_10EUR	.008524	.0506082	0.17	0.866	-.0908391	.1078871
	Norm_20EUR	.0273704	.0503234	0.54	0.587	-.0714335	.1261743
	nsample						
	Feb21	.0397622	.0321123	1.24	0.216	-.0232864	.1028107
	gender						
	männlich	.00245	.0326148	0.08	0.940	-.0615851	.0664852
	weder noch, sondern (opt..	-.0100485	.2466094	-0.04	0.968	-.494236	.474139
	_cons	-.3766501	.0449266	-8.38	0.000	-.464858	-.2884421
kw1b							
	app_installed						
	Nein	**.119468**	.0437637	2.73	**0.006**	.0335434	.2053926
	norm						
	Norm_1cent	-.0161887	.0588985	-0.27	0.784	-.1318286	.0994513
	Norm_2EUR	-.0244853	.0590218	-0.41	0.678	-.1403675	.0913969
	Norm_10EUR	-.0007826	.0587618	-0.01	0.989	-.1161543	.114589
	Norm_20EUR	.0365372	.0584311	0.63	0.532	-.0781851	.1512595
	nsample						
	Feb21	-.0209954	.0372859	-0.56	0.574	-.0942018	.0522109
	gender						
	männlich	.0162012	.0378694	0.43	0.669	-.0581507	.0905531
	weder noch, sondern (opt..	.5074903	.2863409	1.77	0.077	-.0547052	1.069686
	_cons	-.408386	.0521648	-7.83	0.000	-.5108053	-.3059668

triage & AntiApp (-1 sehr unangmessen 1 sehr angemessen)

triage & AntiVax (-1 sehr unangmessen 1 sehr angemessen)



E. Risk Preferences

Distribution – number of safe choices at Holt/Laury task:

Gender

mean_male: 4.96 safe choices (sd 1.74)

mean_female: 5.42 safe choices (sd 2.03)