



Battling the Infodemics: Health Communication Effectiveness During COVID-19

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Motivation

- At the start of the pandemic, the WHO published five basic protective measures to prevent the spread of coronavirus
- High level of adherence to each of them could have been achieved only through changes in individual's habits
- From an individual's perspective, understanding the behavior and the purpose for changing it is crucial
- Theoretical models of health behavior argue that individual risk perceptions are likely to be the motivating factors behind changes in one's behavior.
- However, empirical and experimental evidence supporting this claim are mixed, especially in the setting of a pandemic, and ignore formation of risk perceptions.
- Knowing how risk attitudes form may help to design effective public health interventions.







Research Questions

- Can we rely on individual risk-perceptions during the pandemic as motivating factors for adherence to protective behaviors?
- Can eliciting changes in risk perceptions lead to changes in protective behaviors or intentions to alter protective behaviors?
- What is the role of the social context in the adoption of changes in behavior in the context of the pandemic?







Data

- 7 countries: Denmark, France, Germany, Italy, Portugal, the Netherlands, and the UK
- Sample of 1000 respondents representative of the national population in terms of region, age, gender, and education + 500 extra respondents representative of Lombardy
- Fieldwork: Wave 1 April 2-15, 2020
- Information provision intervention







Pre-intervention

Current adherence to preventive behavior:

Thinking about the <u>last four weeks</u>, did you adhere to the following activities due to concerns about the novel coronavirus?

- No Yes, a bit Yes, quite strongly Yes, fully
- Risk-perceptions:

Please use the scale below to assess your likelihood of getting infected with the novel coronavirus and possible consequences of COVID-19









Intervention



+2 attention checks







Outcomes

Behavioral outcomes

- Intention to increase the adherence to basic protective measures proxy for behavior: range [1-4]
- For a subsample of respondents, we will see a real change in behavior

Do you intend to adhere to the protective measures recommended by the *WHO*?

No Yes, a bit Yes, quite strongly Yes, fully

Risk-perception outcomes

- Same block of questions we ask all participants to assess the risk to health from COVID-19 for themselves, their family members, and people in their community.
- Measured in range [1-5] and as a composite index [1, 1.25, 1.5....5]







Mediation model









Hypotheses

- Hypothesis 1: Compared to the control group, people from the Self-Benefit condition are expected to decrease their risk-perceptions regarding their own health.
- Hypothesis 2: Compared to the control group, people from the Self-Benefit condition are expected to have a higher intention to change behavior, i.e. adhere to target behavior to a greater extent.
- Hypothesis 3: Compared to the control group, people from the Societal-Benefit condition will increase their risk perceptions regarding both their and others' health.
- Hypothesis 4: Compared to the control and Self-Benefit groups, people from the Societal-Benefit condition will have higher intention to change their behavior and adhere to the WHO basic protective measures to a greater extent.







Differences in means across the treatment arms: pooled data

	Self vs		Social vs	Social vs Self		
	Control		Control			
Age	0.475	(1.02)	-0.126	(-0.27)	0.602	(1.29)
Gender	0.0153	(1.09)	0.00945	(0.67)	0.00581	(0.41)
Education	-0.00598	(-0.29)	-0.00546	(-0.26)	-0.000521	(-0.02)
Income	-0.00786	(-0.33)	0.00964	(0.40)	-0.0175	(-0.74)
Risk-aversion	0.0558	(1.54)	0.0106	(0.29)	0.0452	(1.25)
HRAS score	-0.118	(-1.10)	0.0387	(0.36)	-0.157	(-1.47)
Vulnerable	0.00882	(0.63)	0.00192	(0.14)	0.00690	(0.49)
household member						
Trust in WHO	0.0307	(0.95)	-0.00280	(-0.09)	0.0335	(1.04)
Hofstede's	0.0708	(0.14)	0.292	(0.57)	-0.221	(-0.43)
individualism						
Contact	0.0106	(0.49)	-0.0304	(-1.38)	0.0410	(1.86)
My risk of getting	0.0000145	(0.00)	-0.00331	(-0.11)	0.00332	(0.11)
Coronavirus Max mala to health	0.0200	$(1 \ 1 \ 4)$	0.0570	(1 67)	0.0101	(0.55)
from COVID-19	0.0388	(1.14)	0.0579	(1.07)	-0.0191	(-0.55)
Risk to health of	0.0150	(0.44)	0.0275	(0.80)	-0.0125	(-0.37)
family members						
Risk to health of	0.00738	(0.24)	0.0318	(1.01)	-0.0244	(-0.79)
Risk perception	0.0153	(0.59)	0.0285	(1.08)	-0.0132	(-0.50)
(pre-T)		. ,				. ,
Behavior (pre-T)	0.0181	(1.10)	0.0278	(1.68)	-0.00967	(-0.59)
Observations	5092		5048		5040	

t statistics in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001







Intended adherence to preventive behavior across the treatment arms



(a) distribution of answers in each treatment arm

(b) pre- and post-intervention mean of adherence







Logistic regression results for intended behavior outcome (odds ratios reported)

	No risks	Risk_1	Risk_2	Risk_3	Risk_4
Intention to behave (post-T)					
Self-benefit	1.849^{***}	1.964***	1.884^{***}	1.799^{***}	2.065^{***}
	(0.111)	(0.196)	(0.184)	(0.215)	(0.264)
Societal benefit	2.086^{***}	2.110^{***}	2.083***	2.139***	2.311***
	(0.128)	(0.220)	(0.211)	(0.258)	(0.302)

Exponentiated coefficients; Standard errors in parentheses. Ordered logit used in all cases. * p < 0.10, ** p < 0.05, *** p < 0.01







Results

- Since the outcome variable was not normally distributed, I used a Kruskal-Wallis H test, as a non-parametric alternative to one-way ANOVA
- The test determined whether the medians of the groups were different.
- The test showed that there was a statistically significant difference in post-treatment intention to behave between the three groups

 $\chi^2(2) = 171.688, p = 0.0001$

 Kruskal-Wallis H test is an omnibus test and does not conclude between which groups the results differed significantly, so we need to conduct post hoc tests based on the familywise error rate.







Logistic regression results for intended behavior and interaction with age (OR reported)

	No risks	Risk_1	Risk_2	Risk_3	Risk_4
Intention to behave (post-T)					
Self-benefit	1.849***	2.176^{***}	2.173***	2.178^{***}	2.168^{***}
	(0.111)	(0.187)	(0.187)	(0.187)	(0.186)
Societal benefit	2.086^{***}	2.452***	2.430***	2.448^{***}	2.445***
	(0.128)	(0.215)	(0.214)	(0.215)	(0.214)
Gender					
Male	0.648***	0.789***	0.796***	0.800***	0.798***
	(0.0332)	(0.0679)	(0.0686)	(0.0689)	(0.0687)
Interaction treatment*gender					
Self-benefit # Male		0.724***	0.721***	0.722***	0.727***
		(0.0869)	(0.0867)	(0.0868)	(0.0874)
Societal benefit # Male		0.729**	0.729**	0.730**	0.732**
		(0.0899)	(0.0900)	(0.0901)	(0.0903)

Exponentiated coefficients; Standard errors in parentheses. Ordered logit used in all cases. * *p* < 0.10, ** *p* < 0.05, *** *p* < 0.01









Predictive Margins of treatment#gender with 95% CIs







Logistic regression results for intended behavior and interaction with education (OR reported)

	No risks	Risk_1	Risk_2	Risk_3	Risk_4
Intention to behave (post-T)					
Self-benefit	1.849***	1.858***	1.860***	1.865***	1.855***
	(0.111)	(0.218)	(0.219)	(0.219)	(0.218)
Societal benefit	2.086^{***}	1.800^{***}	1.792^{***}	1.809^{***}	1.801^{***}
	(0.128)	(0.216)	(0.216)	(0.218)	(0.217)
Education					
Middle	1.210^{***}	1.184	1.195^{*}	1.184	1.183
	(0.0753)	(0.126)	(0.128)	(0.126)	(0.126)
High	1.206***	1.053	1.063	1.050	1.047
-	(0.0854)	(0.125)	(0.127)	(0.125)	(0.125)
Interaction treatment*education					
Self-benefit # middle		0.930	0.922	0.924	0.930
		(0.136)	(0.135)	(0.135)	(0.136)
Self-benefit # high		1.113	1.114	1.109	1.116
		(0.184)	(0.185)	(0.184)	(0.185)
Societal benefit # middle		1.167	1.155	1.155	1.160
		(0.175)	(0.173)	(0.174)	(0.174)
Societal benefit # high		1.372*	1.373*	1.365*	1.381*
		(0.231)	(0.231)	(0.231)	(0.233)
Exponentiated coefficients; Standard errors in parentheses. Ordered logit used in all cases. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$					







Pairwise comparison using Bonferroni's adjustment

			Bonfe	erroni
	Odds Ratio	Std. Err.	Z	₽> z
Model 1 No risks				
Self-benefit vs Control	1.849093	.1108688	10.25	0.000
Societal benefit vs Control	2.086175	.1280898	11.98	0.000
Societal benefit vs Self-benefit	1.128215	.0688184	1.98	0.144
Model 2 Risk_1				
Self-benefit vs Control	1.822789	.1115778	9.81	0.000
Societal benefit vs Control	2.04006	.1275248	11.41	0.000
Societal benefit vs Self-benefit	1.119197	.0693905	1.82	0.208
Model 3 Risk_2				
Self-benefit vs Control	1.843659	.1111802	10.14	0.000
Societal benefit vs Control	2.081103	.1284396	11.88	0.000
Societal benefit vs Self-benefit	1.12879	.0690705	1.98	0.143
Model 4 Risk_3				
Self-benefit vs Control	1.856839	.1144545	10.04	0.000
Societal benefit vs Control	2.110181	.1333787	11.81	0.000
Societal benefit vs Self-benefit	1.136437	.0713738	2.04	0.125
Model 5 Risk_4				
Self-benefit vs Control	1.875547	.116574	10.12	0.000
Societal benefit vs Control	2.118878	.1346414	11.82	0.000
Societal benefit vs Self-benefit	1.129739	.0714037	1.93	0.161







Discussion

- Results suggest that framing of public health emphasizing either self- or societal benefit of complying with the protective behaviors is an effective way of increasing the probability of future compliance
- Message emphasizing prosocial behavior increased the odds of the intention to behave significantly more than did the prompt emphasizing the self-benefit or no benefit listed at all
- We hypothesized that perceived risks would be the mediation channel of the impact, which did not seem the case.
- The exact channel of influence remains to be identified
- Limitations

