

Appendix A - Study 1 - Sample of the questionnaire with the items used in

Questionnaire items extracted from the original survey available at *Centre for Open Science* (<https://osf.io/ckfb8/>).- NB: Data is available on request

The current coronavirus epidemic ("COVID-19") is all over the news.

People can get infected if they are in close contact with someone who has the virus. People do not notice when they get infected. They only notice when they start having a fever or a cough, perhaps a week later.

Imagine there was an app that you could install on your mobile phone. This app would automatically alert you if you had been in close contact for at least 15 minutes with someone who was infected with the coronavirus.

The next pages explain how such an app could work and will ask comprehension questions. You can only continue the survey if you answer all questions correctly. The app would be developed by the NHS. You would need to install the app by simply clicking a link. Once installed, the app would register which other users are close to you. The app would do this by using Bluetooth and your location. The app would not access your contacts, photos, or other data held on your phone. Only the NHS would have access to the data collected.

Main questionnaire –Acceptability of the App)

QA1. If such an app like the one described before exists, I would

- 1) Definitely install - 5
- 2) Probably install - 4
- 3) May or may not install/Don't know – 3
- 4) Probably won't install - 2
- 5) Definitely won't install - 1

QA2. Suppose *someone in my community* had been infected with the virus, I would

- 1) Definitely install -5
- 2) Probably install -4
- 3) May or may not install/ Don't know - 3
- 4) Probably won't install - 2
- 5) Definitely won't install -1

QA3. suppose *someone I personally know* had been infected with the virus, I would

- 1) Definitely install - 5
- 2) Probably install - 4
- 3) May or may not install/ Don't know - 3
- 4) Probably won't install - 2
- 5) Definitely won't install - 1

QA4. Generally, I would...

- 1) Definitely install - 5
- 2) Probably install - 4
- 3) May or may not install/ Don't know - 3
- 4) Probably won't install - 2
- 5) Definitely won't install - 1

To what extent would you then agree, or not, with the above statement?

“The government should ask mobile phone providers to automatically install the app on all phones.”

QA5. Generally, I would

- 1) Fully agree - 5
- 2) Somewhat agree - 4
- 3) Neither agree nor disagree - 3

- 4) Somewhat disagree - 2
- 5) Fully disagree - 1

QA6. Supposing someone in my community had been infected with the virus, I would

- 1) Fully agree - 5
- 2) Somewhat agree - 4
- 3) Neither agree nor disagree - 3
- 4) Somewhat disagree - 2
- 5) Fully disagree - 1

QA7. Supposing someone I personally know had been infected with the virus, I would

- 1) Fully agree - 5
- 2) Somewhat agree - 4
- 3) Neither agree nor disagree - 3
- 4) Somewhat disagree - 2
- 5) Fully disagree - 1

Opinion of government's handling of the contact tracing app

QP1. "My opinion about the government would improve if they introduced such an app and allowed me to decide myself whether to install it or not" ?

- 1) Fully agree - 5
- 2) Somewhat agree - 4
- 3) Neither agree nor disagree - 3
- 4) Somewhat disagree - 2
- 5) Fully disagree - 1

QP2. To what extent do you agree, or not, with the following statement: "My opinion about the government would improve if they asked mobile phone providers to automatically install such an app on all phones to maximise the chance of stopping the epidemic."?

- 1) Fully agree - 5
- 2) Somewhat agree - 4
- 3) Neither agree nor disagree - 3
- 4) Somewhat disagree - 2
- 5) Fully disagree - 1

Demographics

Q15. How old are you?

- 1) 18-30 2) 31-40 3) 41-50 4) 51-60 5) 61-70 6) 71-80 7) Older than 80

Q16. What is your gender?

- 1) Female 2) Male 3) Other (Non-binary) 4) Prefer not to say

NB: Data is available on request

Study 2 - Questionnaire on the acceptability of the Covid-19 app

Introduction : Please reflect on your experience with the Covid-19 contact tracing app which was introduced during the pandemic to complete the questions below using the following scale:

Scale: 1= Strongly disagree; 2= Disagree; 3= Neutral ; 4 = Agree ; 5 = Strongly agree

Section A

Acceptability of the Covid-19 app (ACC) - Gao et al. (2011)				
1. I used the Covid-19 app to keep on top of the pandemic.				
2. I did not hesitate to use the Covid-19 app during the pandemic.				
3. I enjoyed using the Covid-19 app during the pandemic				
Trust in government (TIG) - Parent et al. (2005) & Upadhyay, P., Kumar, A., Dwivedi, Y. K., & Adlakha, A. (2022).				
1. The government was trustworthy in providing the Covid-19 app.				
2. The government kept its promise about the services on the Covid-19 app.				
3. The government had the citizen's' interests in mind when deploying the Covid-19 app.				
Perception of government handing of the Covid-19 app (POG) - Lazarus JV, Ratzan S, Palayew A, Billari FC, Binagwaho A, Kimball S, et al. (2020)				
1. The government communicated clearly to the citizens about the Covid-19 app.				
2. The government made sure we always had full and easy access to the Covid-19 app.				
3. The government involved all stakeholders in developing and deploying the Covid-19 app.				
Section B: Demographics				
Gender	i) Male	ii) Female	iii) Non-binary	iv) Prefer not to say
Age (in years):	i) up to 25	ii) 26–41	iii) 42 –57	iv) 58 – 67 v) 68 – 76
Country:	i) UK	ii) US	iii) Germany	iv) France v) Italy

Appendix B:

Table B.1: National cultural orientation scores and level of culture dimension based on country

Dimensions/Country	France	Germany	Italy	UK	USA	Number of groups
Power distance	68	35	50	35	40	
	High	Low	Medium	Low	Low	3
Masculinity	43	66	70	66	62	
	Low	High	High	High	High	2
Individualism	71	67	76	89	91	
	High	High	High	High	High	1
Long-term orientation	63	83	61	51	26	
	Medium	High	High	Medium	Low	3
Uncertainty avoidance	86	65	75	35	46	
	High	High	High	Low	Low	2
Indulgence	48	40	30	69	68	
	Medium	Low	Low	High	High	3

NB: Scores sourced from <https://www.hofstede-insights.com> (Hofstede Insights, 2021), Hofstede (2001); and Hofstede et al. (2010). Classification into Low, Medium and High were sourced from Hofstede (2001); whilst the (Low and High) parts can be inferred from Hofstede et al. (2010); Hofstede Insights (2021); and Corporate Finance Institute (2021)

Table B.2a: Personal characteristics of the respondents by country – Study 1

<i>Sex</i>	<i>France</i>	<i>Germany</i>	<i>Italy</i>	<i>UK</i>	<i>US</i>	<i>Total</i>
	(625)	(690)	(N=679)	(N=730)	(N=1235)	(N=3959)
Female	317(50.7%)	345(50.0%)	334(49.2%)	337(46.2%)	671(54.3%)	2004 (50.6%)
Male	308(49.3%)	343(49.7%)	343(50.5%)	388 (53.2%)	557(45.1%)	1939(49.0%)
Other	-	2 (0.3%)	1 (0.1%)	3 (0.4%)	5 (0.4%)	11 (0.3%)
Prefer not to say	-	-	1 (0.1%)	2 (0.3%)	2 (0.2%)	5 (0.1%)
Age (years)						

18-30	153(24.5%)	139(20.1%)	111(16.3%)	123(16.8%)	270(21.9%)	796(20.1%)
31-40	153(24.5%)	177(25.7%)	111(16.3%)	146(20.0%)	244(19.8%)	831(21.0%)
41-50	132(21.1%)	137(19.9%)	136(20.0%)	176(24.1%)	213(17.2%)	794(20.1%)
51-60	90 (14.4%)	152(22.0%)	138(20.3%)	132(18.1%)	188(15.2%)	700(17.7%)
Older than 60	97 (15.6%)	85 (12.3%)	183 (26.9%)	153 (20.9%)	320 (26.0%)	838 (21.2%)

NB: The age groups 61-70, 71-80 and older than 80 years have been merged as “Older than 60”

Table B.2b: Personal characteristics of the respondents by country – Study 2

Sex	UK (157)	US (196)	Germany (188)	France (194)	Italy (175)	Total (910)
Male	52 (33.1%)	67 (34.2%)	92 (48.9%)	80 (41.2%)	85 (48.6%)	376 (41.3%)
Female	104 (66.2%)	127 (64.8%)	89 (47.3%)	113 (58.2%)	86 (49.1%)	519 (57.0%)
Non-binary	1(0.6%)	2 (1.0%)	4 (2.1%)	1 (0.5%)	3 (1.7%)	11 (1.2%)
Prefer not to say -	-	-	3 (1.6%)	-	1 (0.6%)	4 (0.4%)
Age						
18-30	15(9.6%)	16 (8.2%)	73 (38.8%)	47 (24.2%)	39 (22.3%)	190 (20.9%)
31-40	68 (43.3%)	81 (41.3%)	84 (44.7%)	88 (45.4%)	69 (39.4%)	390 (42.9%)
41-50	34 (21.7%)	61 (31.1%)	24 (12.8%)	46 (23.7%)	55 (31.4%)	220 (24.2%)
51-60	21 (13.4%)	20 (10.2%)	6 (3.2%)	8 (4.1%)	10 (5.7%)	65 (7.1%)
Older than 60	19 (12.1%)	18 (9.2%)	1 (0.5%)	5 (2.6%)	2 (1.1%)	45 (4.9%)

Table B3: Convergent Validity and Reliability – Study 1

	Low			Medium			High		
PDI	CA	AVE	CR	CA	AVE	CR	CA	AVE	CR
ACC	0.917	0.858	0.948	0.925	0.869	0.952	0.921	0.863	0.950
PoG	0.731	0.785	0.880	0.778	0.816	0.899	0.783	0.819	0.901

MAS

ACC	0.921	0.863	0.950				0.921	0.864	0.950
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PoG	1.000	1.000	1.000				1.000	1.000	1.000
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INDV	-	-	-	-	-	-	-	-	-
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LTO

ACC	0.954	0.879	0.967	0.925	0.870	0.953	0.956	0.883	0.968
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PoG	0.792	0.827	0.905	0.672	0.750	0.857	0.672	0.749	0.856
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UAV

ACC	0.911	0.918	0.957				0.907	0.915	0.955
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PoG	0.796	0.829	0.906				0.757	0.801	0.889
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IND

ACC	0.990	1.000	0.999	1.000	1.000	1.000	0.990	1.000	0.990
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PoG	1.000	0.991	1.000	1.000	1.000	1.000	1.000	0.990	1.000
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NB: ACC – Acceptability of Covid-19 app; PoG – Perception of government handling of the app; PDI -Power distance, MAS – Masculinity, INDV – Individualism, LTO – Long-term orientation, UAV – Uncertainty avoidance, IND - Indulgence

Table B3b: *Convergent Validity and Reliability - Study 2*

	Low			Medium			High		
PDI	CA	AVE	CR	CA	AVE	CR	CA	AVE	CR
ACC	0.871	0.794	0.920	0.821	0.736	0.893	0.796	0.710	0.880
PoG	0.872	0.796	0.921	0.756	0.672	0.860	0.816	0.731	0.891
TiG	0.867	0.791	0.919	0.692	0.615	0.825	0.782	0.696	0.873

MAS

ACC	0.796	0.710	0.880				0.861	0.783	0.915
PoG	0.816	0.731	0.891				0.855	0.775	0.912
TiG	0.782	0.696	0.873				0.844	0.763	0.906

INDV	-	-	-	-	-	-	-	-	-
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LTO

ACC	0.931	0.878	0.956	0.892	0.822	0.933	0.784	0.698	0.874
PoG	0.913	0.851	0.945	0.905	0.840	0.940	0.778	0.693	0.871
TiG	0.908	0.844	0.942	0.891	0.821	0.932	0.753	0.669	0.859

UAV

ACC	0.912	0.850	0.945				0.784	0.698	0.874
PoG	0.910	0.847	0.943				0.778	0.693	0.871
TiG	0.900	0.833	0.937				0.753	0.669	0.859

IND

ACC	0.778	0.693	0.871	0.796	0.710	0.880	0.912	0.850	0.945
PoG	0.750	0.667	0.857	0.816	0.731	0.891	0.910	0.847	0.943
TiG	0.730	0.648	0.846	0.782	0.696	0.873	0.900	0.833	0.937

Table B.4: *Discriminant Validity – Study 1*

PDI	Low		Medium		High	
Construct	ACC	PoG	ACC	PoG	ACC	PoG

ACC	0.926		0.932		0.929	
PoG	0.676	0.886	0.652	0.903	0.646	0.905
MAS						
ACC	0.929				0.929	
PoG	0.522	1.000			0.392	1.000
INDV	-	-	-	-	-	-
LTO						
ACC	0.938		0.933		0.940	
PoG	0.673	0.909	0.727	0.866	0.734	0.866
UAV						
ACC	0.958				0.956	
PoG	0.653	0.910			0.622	0.895
IND						
ACC	1.000		1.000		0.920	
PoG	0.321	1.000	0.460	1.000	0.640	0.900

ACC – Acceptability of Covid-19 app; PoG – Perception of government handling of the app; TiG – Trust in the government; PDI -Power distance, MAS – Masculinity, INDV – Individualism, LTO – Long-term orientation, UAV – Uncertainty avoidance, IND - Indulgence

Table B.4b: *Discriminant Validity - Study 2*

	Low			Medium			High		
PDI	ACC	PoG	TiG	ACC	PoG	TiG	ACC	PoG	TiG
ACC	0.891			0.858			0.843		
PoG	0.576	0.892		0.527	0.819		0.494	0.855	
TiG	0.589	0.747	0.889	0.553	0.549	0.784	0.530	0.638	0.834
MAS									
ACC	0.843						0.885		
PoG	0.494	0.855					0.569	0.880	
TiG	0.530	0.638	0.834				0.580	0.719	0.873
INDV	-	-	-	-	-	-	-	-	-
LTO									
ACC	0.937			0.907			0.836		
PoG	0.614	0.923		0.479	0.917		0.545	0.832	
TiG	0.600	0.817	0.919	0.538	0.720	0.906	0.562	0.623	0.818
UAV									
ACC	0.922						0.836		
PoG	0.562	0.920					0.545	0.832	
TiG	0.569	0.774	0.913				0.562	0.623	0.818
IND									
ACC	0.832			0.843			0.922		

PoG	0.584	0.817		0.494	0.855		0.562	0.920	
TiG	0.599	0.609	0.805	0.530	0.638	0.834	0.569	0.774	0.913

ACC – Acceptability of Covid-19 app; PoG – Perception of government handling of the app; TiG – Trust in the government; PDI -Power distance, MAS – Masculinity, INDV – Individualism, LTO – Long-term orientation, UAV – Uncertainty avoidance, IND - Indulgence

Table B5. Measurement Invariance test using MICOM (Study 1)

		Step 2			Step 3			
Dimension	Constructs	Corr	Partial	Mean	Condition	Var	Condition	Full
			invariance					invariance
PDI	ACC	1.000	Yes	-0.047	Yes	0.032	Yes	Yes
	PoG	1.000	Yes	0.157	No	-0.118	N	No
MAS	ACC	1.000	Yes	-0.390	No	0.456	N	No
	PoG	1.000	Yes	-0.177	No	0.050	Yes	No
INDV	ACC	1.000	Yes	-0.195	No	0.043	Yes	No
	PoG	1.000	Yes	0.067	Yes	-0.082	Yes	Yes
LTO	ACC	1.000	Yes	-0.047	Yes	0.085	Yes	Yes
	PoG	1.000	Yes	-0.267	No	0.196	No	No
UAV	ACC	1.000	Yes	-0.202	No	0.331	No	No
	PoG	1.000	Yes	0.046	Yes	0.011	Yes	Yes
IND	ACC	1.000	Yes	0.399	No	-0.301	No	No
	PoG	1.000	Yes	0.015	Yes	0.050	Yes	Yes

NB: ACC – Acceptability of Covid-19 app; PoG – Perception of government handling of the app; PDI -Power distance, MAS – Masculinity, INDV – Individualism, LTO – Long-term orientation, UAV – Uncertainty avoidance, IND - Indulgence

Table B.5b: Measurement Invariance test using MICOM (Study 2)

Dimension	Constructs	Step 2			Step 3			Full invariance
		Corr	Partial invariance	Mean	Condition	Var	Condition	
PDI	ACC	0.99	N	-0.176	Y	0.384	N	N
	PoG	1.000	Y	-0.053	Y	0.184	Y	Y
	TiG	1.000	Y	0.013	Y	0.269	N	N
MAS	ACC	0.999	N	-0.133	Y	0.340	N	N
	PoG	1.000	Y	0.008	Y	0.088	Y	Y
	TiG	1.000	Y	0.044	Y	0.152	Y	Y
INDV	ACC	1.000	Y	-	N		N	N
	PoG	1.000	Y	-	N		N	N
	TiG	1.000	Y	-	N		N	N
LTO	ACC	1.000	Y	-0.356	N	0.531	N	N
	PoG	1.000	Y	-0.166	Y	0.628	N	N
	TiG	0.999	Y	-0.172	Y	0.654	N	N
UAV	ACC	1.000	Yes	-0.202	N	0.502	N	N
	PoG	1.000	Yes	-0.084	Y	0.566	N	N
	TiG	1.000	Yes	-0.154	N	0.640	N	N
IND	ACC	1.000	Y	0.183	N	-0.478	N	N
	PoG	0.999	Y	0.105	Y	-0.687	N	N
	TiG	0.999	N	0.201	N	-0.765	N	N

ACC – Acceptability of Covid-19 app; PoG – Perception of government handling of the app; TiG – Trust in the government; PDI -Power distance, MAS – Masculinity, INDV – Individualism, LTO – Long-term orientation, UAV – Uncertainty avoidance, IND - Indulgence

Appendix C – the qualitative study

Semi-structured Interview protocol

Post acceptance evaluation of the Covid-19 contact tracing app – a multi-country study

Some of the questions asked during the interview sessions:

Interviewee profile : Can you please tell us a little bit about yourself?					
a) Age?	i) 18-30	ii) 31-40	iii) 41-50	iv) 51-60	v) Older than 60
b) Gender?	i) Male	ii) Female	iii) Other		
c) Country	i) UK	ii) US	iii) Germany	iv) France	v) Italy

Section A: Perception of government's handling of the Covid-19 app

1) What is your opinion or perception about the way the government handled the introduction of the Covid-19 app?
2) Was the Covid-19 app automatically installed on your mobile phone by your mobile phone service provider acting on the instructions of the government?
a. If Yes, how do you feel about that?
b. If No, did you install the app voluntarily? And why?
3) Could you please share your general impression of the Covid-19 app with us?

4) What factors do you consider as important in the implementation of the Covid-19 app? Please, indicate and rank these factors from 1 upwards, where 1 is the most important, and the higher number is the least important.

For example, Security – fear of surveillance; lack of data privacy; lack of control over the app by me; lack of control of my data; lack of involvement in the design of the app; etc	
Reasons for your choice (s)?	

Section B: Acceptability of the Covid-19 app

5) Could you please what you think or feel about the Covid-19 app?
6) Did you install the app voluntarily on your phone?
a) If Yes did you do so for the safety of yourself, friends, or community?
b) If No, do you feel the government forced you to accept the app by automatically installing it on your phone?
c) What would make you install or use the app?

7) Based on your use of the Covid-19 app, how likely would/do you and?:

Covid-19 app	Not at all	Not much	Not sure	Very	Very much	Why? Please explain the reason for your answer
Like it :						
Accept it						
Recommend it to others						

8) What do you see as challenges with the Covid-19 app? Please explain:
9) How do you think the challenges with the Covid-19 app could have been handled?
10) General opinions, and comments/suggestions for governments on the Covid-19 app?:

Table C.1: Summary of the background of the interviewees by country

Age	France	Germany	UK	US	Total
18-30 years	7	11		2	20
31-40 years	2		8	5	15
41-50 years			9	1	10
51-60 years	2			1	3
61 + years	1		1	1	3
<i>Total</i>	<i>12</i>	<i>11</i>	<i>18</i>	<i>10</i>	<i>51</i>
Gender					
Female	6	4	7	5	22
Male	6	4	11	4	25
Non-binary		1			1
Prefer not to say		2		1	3
<i>Total</i>	<i>12</i>	<i>11</i>	<i>18</i>	<i>10</i>	<i>51</i>

Table C.2: Profile of the interviewees and their national cultural orientation classifications

#	Age group								
	Gender	(years)	Country	PDI	INDV	MAS	LTO	UAV	IND
1	Prefer not to say	18-30	Germany	L	M	M	H	M	M
2	Female	18-30	Germany	L	M	M	H	M	M
3	Female	41-50	UK	L	H	M	M	L	M
4	Male	31-40	UK	L	H	M	M	L	M
5	Female	18-30	Germany	L	M	M	H	M	M
6	Male	31-40	US	M	H	M	L	M	M
7	Male	18-30	Germany	L	M	M	H	M	M
8	Male	18-30	Germany	L	M	M	H	M	M
9	Male	61 +	UK	L	H	M	M	L	M
10	Male	31-40	UK	L	H	M	M	L	M

11	Female	31-40	UK	L	H	M	M	L	M
12	Male	41-50	UK	L	H	M	M	L	M
13	Male	31-40	UK	L	H	M	M	L	M
14	Female	41-50	UK	L	H	M	M	L	M
15	Male	41-50	UK	L	H	M	M	L	M
16	Female	41-50	UK	L	H	M	M	L	M
17	Male	31-40	UK	L	H	M	M	L	M
18	Male	31-40	US	M	H	M	L	M	M
19	Female	31-40	UK	L	H	M	M	L	M
20	Female	18-30	Germany	L	M	M	H	M	M
21	Non-binary	18-30	Germany	L	M	M	H	M	M
22	Male	18-30	Germany	L	M	M	H	M	M
23	Male	18-30	Germany	L	M	M	H	M	M
24	Prefer not to say	18-30	Germany	L	M	M	H	M	M
25	Female	18-30	Germany	L	M	M	H	M	M
26	Female	41-50	UK	L	H	M	M	L	M
27	Male	41-50	US	M	H	M	L	M	M
28	Male	31-40	US	M	H	M	L	M	M
29	Male	31-40	UK	L	H	M	M	L	M
30	Female	31-40	US	M	H	M	L	M	M
31	Male	31-40	UK	L	H	M	M	L	M
32	Female	31-40	US	M	H	M	L	M	M
33	Prefer not to say	61+	US	M	H	M	L	M	M
34	Female	18-30	US	M	H	M	L	M	M
35	Male	41-50	UK	L	H	M	M	L	M
36	Female	18-30	US	M	H	M	L	M	M
37	Male	41-50	UK	L	H	M	M	L	M

38	Female	18-30	France	M	H	M	M	H	M
39	Male	18-30	France	M	H	M	M	H	M
40	Male	18-30	France	M	H	M	M	H	M
41	Male	31-40	France	M	H	M	M	H	M
42	Female	31-40	France	M	H	M	M	H	M
43	Male	60 +	France	M	H	M	M	H	M
44	Male	18-30	France	M	H	M	M	H	M
45	Female	51-60	France	M	H	M	M	H	M
46	Female	41-50	UK	L	H	M	M	L	M
47	Male	18-30	France	M	H	M	M	H	M
48	Female	18-30	France	M	H	M	M	H	M
49	Female	18-30	France	M	H	M	M	H	M
50	Female	51-60	France	M	H	M	M	H	M
51	Female	51-60	US	M	H	M	L	M	M

NB: L – Low, M – Medium and H – High

National culture orientations classification into L, M and H were sourced from Hofstede (2001); Hofstede et al. (2010); Hofstede Insights (2021); and Corporate Finance Institute (2021)

NB: Coding scheme – available on request