

Appendix

Table A1. Means, Standard Deviations and Inter-Correlations

var	<i>m</i>	<i>sd</i>	min	max	Age	Education	Political Orientation	Scientific Literacy	Scientific interest	Attention	Proximity to Science	Positivistic attitudes	Scipop	Expertise	Integrity	Benevolence	Non-med. Exp.	Hi-Int Experience	Medium-Int. Exp.	Low-Int. Exp.
Trust	3.60	0.78	1	5.00	-0.05	0.1***	-0.01	0.12***	0.21***	0.22***	0.02	0.44***	-0.2***	0.33***	0.34***	0.33***	0.24***	0.09**	0.21***	0.08*
Age	48.28	17.32	15	92.00		0.15***	0.07*	-0.07*	0.04	0.07*	0.01	-0.01	0.09**	-0.08**	-0.04	-0.03	-0.08**	-0.31***	0	0.24***
Education	0.48	0.50	0	1.00			-0.05	0.23***	0.24***	0.21***	0.17***	0.02	-0.19***	0.07*	0.06	0.05	0.22***	-0.13***	0.19***	-0.04
Political Orientation	3.50	1.33	1	7.00				-0.1**	-0.09**	-0.07*	-0.09**	0	0.17***	-0.08*	-0.04	-0.02	-0.06	0.03	-0.02	0.05
Scientific Literacy	5.18	3.44	-10	10.00					0.22***	0.12***	0.11***	-0.04	-0.21***	0.13***	0.08*	0.06	0.18***	-0.11***	0.12***	-0.12***
Scientific Interest	3.52	1.11	1	5.00						0.49***	0.13***	0.21***	-0.11***	0.14***	0.13***	0.11***	0.44***	0.09**	0.42***	0.06
Attention	3.04	1.06	1	5.00							0.16***	0.22***	-0.05	0.14***	0.13***	0.14***	0.44***	0.12***	0.47***	0.16***
Proximity to Science	1.24	1.04	0	3.00								-0.05	-0.1**	0.03	0.01	0	0.17***	-0.09*	0.05	-0.07*
Positivistic attitudes	2.95	0.76	1	5.00									-0.05	0.23***	0.3***	0.31***	0.20***	0.21***	0.28***	0.12***
SciPop	2.17	0.77	1	5.00										-0.17***	-0.14***	-0.13***	-0.09**	0.08*	-0.05	0.19***
Expertise	3.82	0.77	1	5.00											0.56***	0.52***	0.16***	0.05	0.07	-0.03
Integrity	3.40	0.77	1	5.00												0.69***	0.13***	0.09**	0.12***	-0.04
Benevolence	3.39	0.74	1	5.00													0.11***	0.07*	0.12***	0.03
Non-med. Exp.	2.49	0.68	1	4.83														0.17***	0.47***	0.11**
Hi-Int Experience	2.16	0.90	1	5.00															0.29***	0.06

Medium-Int. Exp. ntMed	2.62	0.90	1	5.00	0.18***
Low-Int.- Experience	2.65	0.87	1	5.00	

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table A2. Item Wording

Overview of variables used in the analyses

Variable	Type	Items	Levels in analyses
Trust in science	Single item (continuous)	How high is your trust in science in general?	1 = very low, 5 = very high
Epistemic trustworthiness perceptions	Mean score (unweighted average)	[Muenster Epistemic Trustworthiness Inventory (METI), see items below]	continuous, higher values indicate higher perceived trustworthiness
Expertise	Mean score (unweighted average)	[semantic differentials, see right column]	1 = incompetent, 5 = competent 1 = inexperienced, 5 = experienced 1 = unqualified, 5 = qualified
Integrity	Mean score (unweighted average)	[semantic differentials, see right column]	1 = insincere, 5 = sincere 1 = dishonest, 5 = honest 1 = unjust, 5 = just
Benevolence	Mean score (unweighted average)	[semantic differentials, see right column]	1 = immoral, 5 = moral 1 = unethical, 5 = ethical 1 = irresponsible, 5 = responsible
Positivistic attitudes toward science	Mean score (unweighted average)	[mean score, see items below]	continuous, higher values indicate more positivistic attitudes
		Science and research can solve any problem.	1 = do not agree at all, 5 = agree completely
		Science and research improve our lives.	1 = do not agree at all, 5 = agree completely
		The benefits of science and research are greater than potential damage.	1 = do not agree at all, 5 = agree completely
		Science should be allowed to explore everything without restriction.	1 = do not agree at all, 5 = agree completely
		One day science will give us a complete picture of how nature and the universe work.	1 = do not agree at all, 5 = agree completely
Science-related populist attitudes	Composite score (Goertz approach)	[SciPop Scale, see items below]	continuous, higher values indicate stronger endorsement of science-related populist attitudes
Conceptions of the ordinary people	Mean score (unweighted average)	What unites the ordinary people is that they trust their common sense in everyday life.	1 = do not agree at all, 5 = agree completely
		Ordinary people are of good and honest character.	1 = do not agree at all, 5 = agree completely

Conceptions of the academic elite	Mean score (unweighted average)	Scientists are only after their own advantage.	1 = do not agree at all, 5 = agree completely
Demands for decision-making sovereignty	Mean score (unweighted average)	Scientists are in cahoots with politics and business.	1 = do not agree at all, 5 = agree completely
		The people should have influence on the work of scientists.	1 = do not agree at all, 5 = agree completely
Demands for truth-speaking sovereignty	Mean score (unweighted average)	People like me should be involved in decisions about the topics scientists research.	1 = do not agree at all, 5 = agree completely
		In case of doubt, one should rather trust the life experience of ordinary people than the estimations of scientists.	1 = do not agree at all, 5 = agree completely
Experiences with science	Mean score (unweighted average)	We should rely more on common sense and less on scientific studies.	1 = do not agree at all, 5 = agree completely
Mass-mediated experiences with science		How often do you come into contact with science and research via the following media?	
High interactive	Mean score (unweighted average)	[mean score, see items below]	continuous, higher values indicate more frequent contact
Medium interactive	Mean score (unweighted average)	Facebook, Twitter or other social media	1 = never, 5 = very frequently
		YouTube or other video platforms	1 = never, 5 = very frequently
		Blogs or online forums	1 = never, 5 = very frequently
		[mean score, see items below]	continuous, higher values indicate more frequent contact
Low interactive	Mean score (unweighted average)	Print science magazines	1 = never, 5 = very frequently
		Websites of scientific institutions	1 = never, 5 = very frequently
		Websites/apps of newspaper/magazines	1 = never, 5 = very frequently
		[mean score, see items below]	continuous, higher values indicate more frequent contact
Non-mass-mediated experiences with science	Mean score (unweighted average)	Radio	1 = never, 5 = very frequently
		TV	1 = never, 5 = very frequently
		TV/radio streams/on-demand-services	1 = never, 5 = very frequently
		How often do you engage in the following activities?	
		[mean score, see items below]	continuous, higher values indicate more frequent contact

		Visit museums and exhibitions on science and research	1 = never, 5 = very frequently
		Visit zoos, aquariums or botanical gardens	1 = never, 5 = very frequently
		Talk to friends and acquaintances about science and research	1 = never, 5 = very frequently
		Talk about science and research in messengers like WhatsApp	1 = never, 5 = very frequently
Age	Single item (continuous)	In which year were you born?	[Age in years]
Gender	Single item (categorical)	[Determined by interviewer]	0 = male, 1 = female
Education	Single item (dummy-coded)	What is your educational background?	1 = compulsory school, 2 = secondary education, 3 = university degree
Interest in science	Single item (continuous)	How interested are you in science and research?	1 = not interested at all, 5 = very strongly interested
Attention to media coverage on science and research	Single item (continuous)	How attentively do you follow media coverage on science and research?	1 = not attentively at all, 5 = very attentively
Scientific literacy	Composite score ^a	The continents on which we live have been moving for millions of years. (correct)	1 = certainly wrong, 2 = rather wrong, 3 = rather true, 4 = certainly true, 98 = don't know
		Electrons are smaller than atoms. (correct)	1 = certainly wrong, 2 = rather wrong, 3 = rather true, 4 = certainly true, 98 = don't know
		Antibiotics kill viruses as well as bacteria. (false)	1 = certainly wrong, 2 = rather wrong, 3 = rather true, 4 = certainly true, 98 = don't know
		The genes of the mother decide if the child will be a boy or a girl. (false)	1 = certainly wrong, 2 = rather wrong, 3 = rather true, 4 = certainly true, 98 = don't know
		Scientific theories never change. (false)	1 = certainly wrong, 2 = rather wrong, 3 = rather true, 4 = certainly true, 98 = don't know
Proximity to science	Composite score ^b	Are you a scientist yourself?	0 = no, 1 = yes
		Do you know a scientist personally?	0 = no, 1 = yes
		Are you professionally involved with science?	0 = no, 1 = yes
		Do you have family members who have studied or are studying?	0 = no, 1 = yes

Note. Original items were in German, French, and Italian, but we translated them into English for this article.

- ^a Respondents were given -2 points for every correct (false) statement they were certain it was wrong (true), -1 point for every correct (false) statement they were rather sure it was wrong (true), 0 points for every item for which they did not know if it was wrong or true, 1 point for every correct (false) statement they were rather sure was true (wrong), and 2 points for every correct (wrong) statement they were certain it was true (wrong). The composite score was calculated by summing up all points.
- ^b Respondents who reported working as scientists were assigned a 4. Respondents were assigned a 3 if they answered “yes” to all three remaining questions; a 2 if they answered “yes” to two of these questions; a 1 if they answered “yes” to one of these questions; a 0 if they answered “yes” to none of these questions. The resulting score thus ranged from 0 (least proximity to science) to 4 (greatest proximity to science).

Table A3. Factor loadings of measured constructs in the measurement and the structural model

Latent construct (second order)	Latent construct (first order)	Observed variable	Measurement model			Structural model		
			β	B	SE	β	B	SE
	Trustworthiness	Expertise	0.65	1.00		0.61	1.00	
		Benevolence	0.81	1.19	0.08	0.78	1.22	0.09
		Integrity	0.85	1.28	0.08	0.82	1.31	0.09
Experiences	Mass-mediated exp.	Mass-mediated	0.95	1.00		1.00	1.00	
		Non-mass-mediated	0.58	1.25	0.26	0.34	0.61	0.15
		Highly interactive	0.35	1.00		0.42	1.00	
		Medium interactive	0.83	2.33	0.32	0.52	1.22	0.20
		Low interactive	0.21	0.56	0.13	0.22	0.51	0.12

Table A4. χ^2 difference tests

Constrained path	χ^2 -statistics df = 28	$\Delta\chi^2$
Trust – trustworthiness	581.63	295.12
Trust – scipop	873.01	736.74
Trust – positivistic attitudes	441.64	293.54
Trust – experiences	623.07	608.88
Trustworthiness – scipop	961.73	721.70
Trustworthiness – positivistic attitudes	625.69	389.60
Trustworthiness – experiences	775.60	717.16
Scipop – positivistic attitudes	749.17	506.32
Scipop – experiences	727.15	520.44
Positivistic attitudes – experiences	570.74	479.29

Note: Original measurement model: $\chi^2 = 108.70$ (df = 27)

Table A5. Model statistics and difference tests

Model name	χ^2	df	$\Delta\chi^2$	Probability
Theoretical	60.25	28		
Null	403.65	38	298.50	<.001
Saturated	220.20	34	137.26	<.001
Next-best constrained	150.90	30	91.63	<.001
Next-best unconstrained	55.30	26	.445	0.10