

Supplemental Materials for “Psychological distance to science affects science evaluations”

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Supplemental Materials A: Distance message frames validation study

Before testing the impact of distance frames on science attitudes, we tested their validity using a series of manipulation checks. We assigned participants (UK, Prolific; final $N = 1173$; described in more detail in the main text) to one of four groups: each group read an advertisement about the science of genetic modification (GM) or nanotechnology in food production that were either framed psychologically close or distant. After, we asked participants about their perceptions of psychological distance (i.e., spatial, temporal, social and hypothetical) from the science presented in the message. We hypothesised that participants presented with close versus distant framing would perceive less distance to science on each distance dimension.

Materials

Science online articles

The length of the articles was kept as constant as possible - all articles contained between 148 and 150 words, and two references per each distance dimension (totalling eight references per message). Complete formatting and wording of the distance frames for both GM and nanotechnology is available here:

https://osf.io/ps5b7?view_only=da758666bf2840519e5c35730073f6ed

Manipulation check items

The order of the items was randomized and participants saw one item per page. All items were answered on a 7-point Likert scale. For spatial, temporal and social distance, response options ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). For hypothetical distance, options ranged from 1 (*extremely unlikely/very uncertain*) to 7 (*extremely likely/very certain*).

All items were recoded so that a higher score reflects higher distance perceptions. Exact wording for all items is shown in Supplemental Table 1.

Supplemental Table 1.

Manipulation checks item wording

Distance dimension	Variable name	Text
Spatial	Spt1	This information refers to something happening nearby (R)
	Spt2	The research on GM/nanotechnology in food mostly happens in regions far away from me
Temporal	Temp1	This information refers to something happening in the present (R)
	Temp2	It will only be in the distant future that GM/nanotech will be applied in food production
Social	Soc1	The article refers to people like me (R)
	Soc2	I feel that people like me can engage in the discussion about GM foods /nanotechnology (R)
Hypothetical	Hyp1	To what extent are the scientists certain that genetic modification/nanotechnology can be used to alter characteristics of food crops? (R)
	Hyp2	To what extent do you feel it is certain that genetic modification/nanotechnology can be used for altering characteristics of food crops? (R)

Results

An independent samples *t*-test was performed for each item separately. Analyses were performed separately for GM and nanotechnology. A Bonferroni-adjusted significance level was used ($0.05/8 = .006$) for both sets of tests. The results are summarized in Supplemental Table 2 and Supplemental Figure 1.

Among participants assigned to the nanotechnology domain, those in the distant condition consistently reported higher perceived distance to science all four dimensions ($ps < .001$, Cohen’s *ds* range from .39 to 1.56). Therefore, the manipulation reliably alters distance perception in the expected direction and was thus deemed valid.

As for GM, participants in the distant condition consistently reported higher perceived distance to science on the spatial, social and temporal dimension ($ps < .001$, Cohen's d s range from .39 to 1.60). As for hypothetical distance, albeit the mean differences were in the hypothesized direction for both items, one was not significant ($p = .169$), while the second one was ($d = .29, p = .002$). Therefore, albeit with smaller effect sizes, our manipulations altered perceptions of hypothetical distance.

Supplemental Table 2

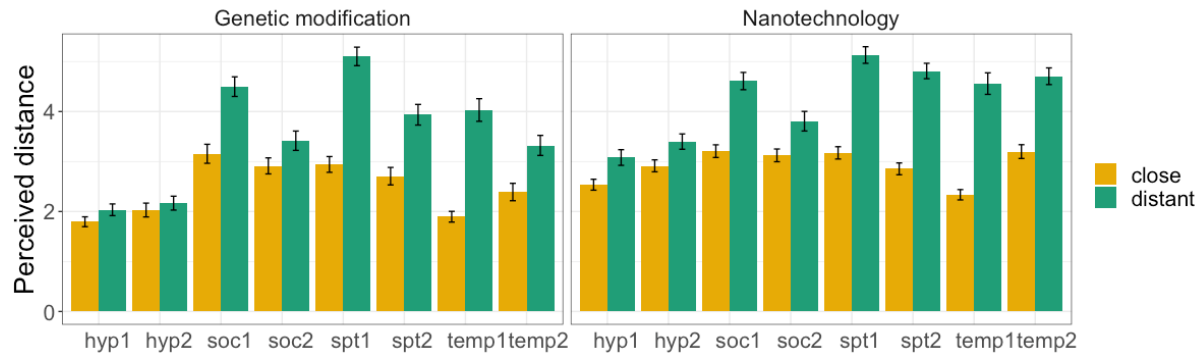
Independent samples t-tests for each manipulation check item, per domain.

Variable	Genetic modification $n_{\text{close}} = 239; n_{\text{distant}} = 233$				Nanotechnology $n_{\text{close}} = 463^1; n_{\text{distant}} = 238$			
	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
Hyp1	3.08	455	0.002	0.28	5.60	466	<.001	0.45
Hyp2	1.38	470	0.169	0.13	4.90	514	<.001	0.39
Soc1	9.62	469	<.001	0.89	12.82	488	<.001	1.02
Soc2	3.94	452	<.001	0.36	5.73	439	<.001	0.46
Spt1	17.40	457	<.001	1.60	18.59	494	<.001	1.47
Spt2	8.89	455	<.001	0.82	19.80	506	<.001	1.56
Temp1	16.69	333	<.001	1.54	18.23	349	<.001	1.54
Temp2	6.89	459	<.001	0.64	13.65	540	<.001	1.07

Note. ¹Due to an error in condition randomization, all participants in the nanotechnology domain were assigned to the close condition. We subsequently collected additional participants for the distant condition.

Supplemental Figure 1

Distance condition differences in perceived distance.



Supplemental Materials B. Descriptives and correlations, Study 1

Supplemental Table 3

Means, standard deviations, and correlations with confidence intervals, Study 1, GM

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. GM skept (pre)	3.79	1.29								
2. GM skept (post)	3.71	1.20	.85*** [.82, .87]							
3. GM support (pre)	4.13	1.61	-.86*** [-.88, -.83]	-.77*** [-.81, -.73]						
4. GM support (post)	4.44	1.52	-.79*** [-.82, -.75]	-.88*** [-.90, -.86]	.79*** [.75, .82]					
5. Attitude valence	4.71	1.28	-.59*** [-.64, -.52]	-.68*** [-.72, -.63]	.55*** [.48, .61]	.72*** [.67, .76]				
6. Credibility	4.87	1.21	-.52*** [-.58, -.45]	-.61*** [-.66, -.55]	.50*** [.43, .56]	.62*** [.56, .67]	.77*** [.73, .80]			
7. Spirituality	2.68	1.69	.36*** [.29, .44]	.34*** [.26, .41]	-.37*** [-.44, -.29]	-.30*** [-.38, -.21]	-.22*** [-.30, -.13]	-.18*** [-.26, -.09]		
8. Trust in scientists	3.70	0.72	-.48*** [-.55, -.41]	-.46*** [-.53, -.39]	.41*** [.33, .48]	.40*** [.32, .47]	.33*** [.25, .41]	.33*** [.24, .40]	-.20*** [-.29, -.12]	
9. Science knowledge	9.90	2.16	-.35*** [-.43, -.27]	-.33*** [-.41, -.25]	.36*** [.28, .43]	.34*** [.26, .42]	.22*** [.14, .31]	.29*** [.20, .37]	-.23*** [-.31, -.14]	.21*** [.13, .30]

Note. GM = genetic modification; skept = skepticism.

Values in square brackets indicate the 95% confidence interval for each correlation. *** indicates $p < .001$

Supplemental Table 4

Means, standard deviations, and correlations with confidence interval, Study 1, nanotechnology

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
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1. Nano skept (pre)	3.96	0.98									
2. Nano skept (post)	3.92	1.04	.75 ^{***}								
			[.71, .78]								
3. Nano support (pre)	4.63	1.33	-.72 ^{***}	-.55 ^{***}							
			[-.75, -.67]	[-.60, -.49]							
4. Nano support (post)	4.62	1.35	-.60 ^{***}	-.79 ^{***}	.55 ^{***}						
			[-.65, -.55]	[-.82, -.76]	[.49, .61]						
5. Attitude valence	4.97	1.31	-.41 ^{***}	-.63 ^{***}	.31 ^{***}	.68 ^{***}					
			[-.48, -.34]	[-.68, -.58]	[.23, .39]	[.63, .72]					
6. Credibility	4.71	1.17	-.36 ^{***}	-.53 ^{***}	.27 ^{***}	.57 ^{***}	.69 ^{***}				
			[-.43, -.28]	[-.58, -.46]	[.19, .34]	[.51, .62]	[.65, .74]				
7. Spirituality	2.75	1.69	.21 ^{***}	.21 ^{***}	-.22 ^{***}	-.19 ^{***}	-.15 ^{***}	-.10 [*]			
			[.13, .29]	[.13, .29]	[-.30, -.14]	[-.27, -.11]	[-.23, -.06]	[-.18, -.02]			
8. Trust in scientists	3.72	0.72	-.46 ^{***}	-.45 ^{***}	.40 ^{***}	.39 ^{***}	.29 ^{***}	.25 ^{***}	-.19 ^{***}		
			[-.52, -.39]	[-.51, -.38]	[.32, .46]	[.32, .46]	[.21, .36]	[.17, .33]	[-.27, -.11]		
9. Science knowledge	10.03	2.18	-.18 ^{***}	-.17 ^{***}	.27 ^{***}	.21 ^{***}	.07	.05	-.22 ^{***}	.27 ^{***}	
			[-.26, -.10]	[-.25, -.09]	[.19, .35]	[.13, .29]	[-.01, .16]	[-.03, .13]	[-.30, -.14]	[.19, .34]	

Note. Nano = nanotechnology; skept = skepticism.

Values in square brackets indicate the 95% confidence interval for each correlation.

* indicates $p < .05$. *** indicates $p < .001$

**Supplemental Materials C. trust in scientists, science knowledge, and spirituality as
potential moderators, Study 1**

We tested general science knowledge, trust in scientists, and spirituality as potential moderators of the PSYDISC effects on science attitudes. We found no significant interactions in the domain of nanotechnology. As for GM, the PSYDISC frames interacted with general trust in scientists ($\beta = -.10$, $t(478) = -1.98$, $p = .048$), such that they decreased skepticism at average ($\beta = -.11$, $t(478) = -2.34$, $p = .020$) and below average (i.e., -1SD; $\beta = -.21$, $t(478) = -3.07$, $p = .002$), but not at above-average (i.e., +1SD; $\beta = -.01$, $t(478) = -0.22$, $p = .824$) levels of general trust in scientists. This would suggest the possibility that people who are generally wary of scientists might rely more on contextual proximity cues in science communication in forming and revisiting their science attitudes. However, this exploratory (and not well-powered) result should be interpreted with caution. Detailed results of all moderation analyses are available in Supplemental Tables 5-32.

Genetic modification

Supplemental Table 5

Condition x Trust in Science interaction, GM attitude valence

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.11	.06	1.84	.067
Condition (distant = 1)	-0.23	.09	-2.63	.009

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Trust in scientists	0.33	.06	6.02	.000
Condition × trust in scientists	0.01	.09	0.09	.929

Supplemental Table 6

Condition x Science knowledge, GM attitude valence

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.09	.06	1.44	.151
Condition (distant = 1)	-0.18	.09	-2.00	.046
Science knowledge	0.16	.07	2.42	.016
Condition × science knowledge	0.12	.09	1.33	.186

Supplemental Table 7

Condition x Spirituality, GM attitude valence

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.10	.06	1.60	.109
Condition (distant = 1)	-0.20	.09	-2.30	.022
Spirituality	-0.20	.06	-3.24	.001
Condition × spirituality	-0.04	.09	-0.47	.639

Supplemental Table 8

Condition x Trust in Scientists, GM credibility

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.13	.06	2.23	.027
Condition (distant = 1)	-0.27	.09	-3.19	.002
Trust in scientists	0.33	.06	5.90	.000
Condition × trust in scientists	0.02	.09	0.22	.825

Supplemental Table 9

Condition x Knowledge, GM credibility

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.11	.06	1.79	.074
Condition (distant = 1)	-0.22	.09	-2.53	.012
Science knowledge	0.26	.06	4.03	.000
Condition × science knowledge	0.05	.09	0.59	.557

Supplemental Table 10

Condition x Spirituality, GM credibility

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.12	.06	1.96	.050
Condition (distant = 1)	-0.25	.09	-2.80	.005
Spirituality	-0.19	.06	-3.00	.003
Condition × spirituality	0.01	.09	0.15	.884

Supplemental Table 11*Condition x Trust, GM skepticism, controlling for pre-test skepticism*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.05	.03	-1.61	.109
Condition (distant = 1)	0.12	.05	2.38	.017
Trust in scientists	-0.04	.03	-1.01	.311
Skepticism (pre-test)	0.82	.03	29.68	.000
Condition × trust in scientists	-0.05	.03	-1.98	.048

Supplemental Table 12*Condition x Trust, GM skepticism, means*

Trust in scientists	Condition	<i>M</i>	<i>SE</i>	<i>df</i>	95% CI [LL, UL]
3.00	close	-0.02	.05	478	[-0.11, 0.07]
3.72	close	-0.06	.03	478	[-0.12, 0.01]
4.44	close	-0.09	.05	478	[-0.19, 0.01]
3.00	distant	0.19	.05	478	[0.09, 0.29]
3.72	distant	0.06	.03	478	[-0.01, 0.13]
4.44	distant	-0.07	.05	478	[-0.18, 0.03]

Supplemental Table 13*Condition x Trust, GM skepticism, contrasts*

contrast	Trust in scientists	<i>B</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
close - distant	3.00	-0.21	.07	478	-3.07	.002

contrast	Trust in scientists	<i>B</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
close - distant	3.72	-0.11	.05	478	-2.34	.020
close - distant	4.44	-0.02	.07	478	-0.22	.824

Supplemental Table 14

Condition x Knowledge, GM skepticism, controlling for pre-test skepticism

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.05	.03	-1.59	.113
Condition (distant = 1)	0.11	.05	2.19	.029
Science knowledge	0.01	.04	0.30	.764
Skepticism (pre-test)	0.84	.03	32.27	.000
Condition × science knowledge	-0.09	.05	-1.75	.081

Supplemental Table 15

Condition x Spirituality, GM skepticism, controlling for pre-test skepticism

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.05	.03	-1.58	.115
Condition (distant = 1)	0.11	.05	2.28	.023
Spirituality	0.01	.04	0.30	.767
Skepticism (pre-test)	0.84	.03	32.06	.000
Condition × spirituality	0.05	.05	0.99	.322

Supplemental Table 16*Condition x Trust, GM support, controlling for pre-test skepticism*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.04	.04	1.02	.307
Condition (distant = 1)	-0.09	.06	-1.54	.123
Trust in scientists	0.06	.04	1.53	.127
Support (pre-test)	0.75	.03	24.52	.000
Condition × trust in scientists	0.10	.06	1.74	.082

Supplemental Table 17*Condition x Trust, GM support, means*

Trust in scientists	Condition	<i>M</i>	<i>SE</i>	<i>df</i>	95% CI [LL, UL]
3.00	close	-0.02	.05	478	[-0.12, 0.09]
3.72	close	0.04	.04	478	[-0.04, 0.12]
4.44	close	0.10	.06	478	[-0.01, 0.20]
3.00	distant	-0.20	.06	478	[-0.32, -0.08]
3.72	distant	-0.04	.04	478	[-0.12, 0.04]
4.44	distant	0.12	.06	478	[0.00, 0.23]

Supplemental Table 18

Condition x Trust, GM support, contrasts

contrast	Trust in scientists	<i>B</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
close - distant	3.00	0.18	.08	478	2.31	.021
close - distant	3.72	0.08	.06	478	1.51	.133
close - distant	4.44	-0.02	.08	478	-0.19	.848

Supplemental Table 19

Condition x Knowledge, GM support, controlling for pre-test support

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.04	.04	0.89	.373
Condition (distant = 1)	-0.07	.06	-1.27	.206
Science knowledge	0.07	.04	1.52	.130
Support (pre-test)	0.76	.03	25.30	.000
Condition × science knowledge	0.01	.06	0.16	.871

Supplemental Table 20

Condition x Knowledge, GM support, controlling for pre-test support

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.04	.04	0.96	.337
Condition (distant = 1)	-0.08	.06	-1.39	.167
Spirituality	0.00	.04	0.07	.948
Support (pre-test)	0.78	.03	25.78	.000
Condition × spirituality	-0.03	.06	-0.56	.573

Nanotechnology

Supplemental Table 21

Condition x Trust, Nano attitude valence, controlling for pre-test attitude valence

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.03	.06	0.54	.588
Condition (distant = 1)	-0.06	.08	-0.76	.446
Trust in scientists	0.27	.06	4.59	.000
Condition × trust in scientists	0.04	.08	0.45	.654

Supplemental Table 22

Condition x Knowledge, Nano attitude valence, controlling for pre-test attitude valence

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.03	.06	0.42	.673
Condition (distant = 1)	-0.05	.09	-0.58	.563
Science knowledge	0.11	.06	1.81	.070
Condition × science knowledge	-0.07	.09	-0.84	.399

Supplemental Table 23

Condition x Spirituality, Nano attitude valence, controlling for pre-test attitude valence

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.03	.06	0.42	.672
Condition (distant = 1)	-0.05	.09	-0.57	.567
Spirituality	-0.16	.06	-2.67	.008

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Condition × spirituality	0.02	.09	0.24	.811

Supplemental Table 24

Condition x Trust, Nano credibility, controlling for pre-test credibility

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.08	.06	1.31	.192
Condition (distant = 1)	-0.15	.08	-1.81	.070
Trust in scientists	0.26	.06	4.38	.000
Condition × trust in scientists	0.00	.08	-0.05	.961

Supplemental Table 25

Condition x Knowledge, Nano credibility, controlling for pre-test credibility

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.07	.06	1.17	.242
Condition (distant = 1)	-0.14	.09	-1.62	.107
Science knowledge	0.10	.06	1.64	.102
Condition × science knowledge	-0.09	.09	-1.08	.279

Supplemental Table 26

Condition x Spirituality, Nano credibility, controlling for pre-test credibility

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
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	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.07	.06	1.14	.255
Condition (distant = 1)	-0.14	.09	-1.59	.112
Spirituality	-0.13	.06	-2.23	.026
Condition × spirituality	0.06	.09	0.75	.456

Supplemental Table 27

Condition x Trust, Nano skepticism, controlling for pre-test skepticism

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.07	.04	-1.60	.110
Condition (distant = 1)	0.12	.06	2.19	.029
Trust in scientists	-0.16	.04	-3.89	.000
Skepticism (pre-test)	0.69	.03	21.96	.000
Condition × trust in scientists	0.07	.06	1.18	.239

Supplemental Table 28

Condition x Knowlegde, Nano skepticism, controlling for pre-test skepticism

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.06	.04	-1.56	.120
Condition (distant = 1)	0.12	.06	2.16	.032
Science knowledge	-0.06	.04	-1.36	.174
Skepticism (pre-test)	0.74	.03	25.73	.000
Condition × science knowledge	0.03	.06	0.55	.584

Supplemental Table 29*Condition x Spirituality, Nano skepticism, controlling for pre-test skepticism*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.06	.04	-1.54	.123
Condition (distant = 1)	0.12	.06	2.14	.033
Spirituality	0.06	.04	1.48	.141
Skepticism (pre-test)	0.74	.03	25.40	.000
Condition × spirituality	-0.01	.06	-0.09	.925

Supplemental Table 30*Condition x Trust, Nano support, controlling for pre-test support*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.00	.05	0.02	.985
Condition (distant = 1)	0.00	.07	-0.03	.973
Trust in scientists	0.20	.05	3.80	.000
Support (pre-test)	0.47	.04	12.47	.000
Condition × trust in scientists	0.02	.07	0.32	.746

Supplemental Table 31*Condition x Knowledge, Nano support, controlling for pre-test support*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.00	.05	-0.05	.963

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Condition (distant = 1)	0.01	.07	0.07	.947
Science knowledge	0.07	.05	1.37	.172
Support (pre-test)	0.54	.04	14.49	.000
Condition × science knowledge	-0.01	.07	-0.17	.865

Supplemental Table 32

Condition x Spirituality, Nano support, controlling for pre-test support

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	0.00	.05	-0.04	.967
Condition (distant = 1)	0.01	.07	0.07	.942
Spirituality	-0.05	.05	-1.01	.313
Support (pre-test)	0.54	.04	14.74	.000
Condition × spirituality	-0.04	.07	-0.58	.562

Supplemental Materials D. Descriptives and correlations, Study 2

Supplemental Table 33

Means, standard deviations, and correlations with confidence intervals, Study 2

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Attitude valence (pre)	3.78	1.60								
2. Attitud valence (post)	4.34	1.36	.62***							
			[.58, .65]							
3. Credibility (pre)	4.15	1.55	.87***	.59***						
			[.86, .88]	[.56, .63]						
4. Credibility (post)	4.68	1.32	.49***	.77***	.52***					
			[.44, .53]	[.75, .80]	[.48, .56]					
5. GM skept. (pre)	3.89	1.28	-.84***	-.61***	-.82***	-.53***				
			[-.86, -.83]	[-.65, -.58]	[-.83, -.80]	[-.56, -.48]				
6. GM skept (post)	3.79	1.22	-.76***	-.71***	-.74***	-.62***	.86***			
			[-.79, -.74]	[-.74, -.69]	[-.76, -.71]	[-.65, -.58]	[.85, .88]			
7. Spirituality	2.67	1.69	-.16***	-.12***	-.16***	-.10***	.19***	.20***		
			[-.21, -.10]	[-.18, -.07]	[-.21, -.11]	[-.16, -.05]	[.14, .25]	[.15, .25]		
8. Trust in scientists	3.70	0.78	.46***	.47***	.50***	.46***	-.53***	-.54***	-.20***	
			[.42, .51]	[.42, .51]	[.46, .54]	[.42, .51]	[-.57, -.49]	[-.58, -.50]	[-.25, -.15]	
9. Science knowledge	9.97	2.25	.31***	.23***	.33***	.22***	-.31***	-.30***	-.18***	.29***
			[.26, .36]	[.18, .28]	[.28, .38]	[.17, .27]	[-.36, -.26]	[-.35, -.25]	[-.23, -.12]	[.24, .34]

Note. GM = genetic modification; skept = skepticism. Values in square brackets indicate the 95% confidence interval for each correlation. *** indicates $p < .01$.

Supplemental Materials E: trust in scientists, science knowledge, and spirituality as potential mediators, Study 2

As in Study 1, we tested science knowledge, general trust in scientists, and spirituality as potential moderators of the effect of distance on attitude valence and skepticism. To do so, we employed an ANCOVA for each of the dependent variables, controlling for pre-test DV, the main effect of the potential moderator and condition, as well as their interaction term. None of the tested interactions were significant (all $ps > .302$). Combined with weak evidence for moderation effects from Study 1, these results reinforce support for the notion that the psychological distance framing is equally effective for people with various levels of science knowledge, trust in scientists and spirituality. Detailed results of all moderation analyses are available below in Supplemental Tables 34–42.

Supplemental Table 34

Condition x Trust in Science interaction, GM attitude valence

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.06	.03	-2.09	.037
Condition (distant = 1)	0.12	.04	2.95	.003
Trust in scientists	0.22	.03	7.09	.000
Attitude valence (pre-test)	0.52	.02	21.71	.000
Condition × trust in scientists	0.01	.04	0.19	.853

Supplemental Table 35*Condition x Science knowledge, GM attitude valence, controlling for pre-test valence*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.07	.03	-2.40	.017
Condition (distant = 1)	0.14	.04	3.39	.001
Science knowledge	0.18	.03	5.85	.000
Attitude valence (pre-test)	0.58	.02	26.59	.000
Condition × science knowledge	0.00	.04	-0.04	.971

Supplemental Table 36*Condition x Spirituality, GM attitude valence, controlling for pre-test valence*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.07	.03	-2.20	.028
Condition (distant = 1)	0.14	.04	3.13	.002
Spirituality	-0.09	.03	-2.76	.006
Attitude valence (pre-test)	0.61	.02	28.03	.000
Condition × spirituality	0.01	.04	0.21	.832

Supplemental Table 37*Condition x Trust in Scientists, GM credibility, controlling for pre-test credibility*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.02	.03	-0.57	.570
Condition (distant = 1)	0.04	.04	0.80	.422

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Trust in scientists	0.35	.03	10.63	.000
Credibility (pre-test)	0.37	.03	14.83	.000
Condition × trust in scientists	-0.03	.04	-0.72	.475

Supplemental Table 38

Condition x Knowledge, GM credibility, controlling for pre-test credibility

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.03	.03	-0.87	.385
Condition (distant = 1)	0.05	.05	1.20	.231
Science knowledge	0.25	.03	7.54	.000
Credibility (pre-test)	0.47	.02	20.23	.000
Condition × science knowledge	-0.05	.05	-1.03	.302

Supplemental Table 39

Condition x Spirituality, GM credibility, controlling for pre-test credibility

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.02	.03	-0.59	.554
Condition (distant = 1)	0.04	.05	0.87	.383
Spirituality	-0.13	.03	-3.76	.000
Credibility (pre-test)	0.51	.02	21.83	.000
Condition × spirituality	0.04	.05	0.88	.380

Supplemental Table 40*Condition x Trust, GM skepticism, controlling for pre-test skepticism*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.05	.02	-2.32	.020
Condition (distant = 1)	0.09	.03	3.29	.001
Trust in scientists	-0.11	.02	-5.19	.000
Skepticism (pre-test)	0.80	.02	49.75	.000
Condition × trust in scientists	-0.02	.03	-0.55	.583

Supplemental Table 41*Condition x Knowledge, GM skepticism, controlling for pre-test skepticism*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.05	.02	-2.30	.022
Condition (distant = 1)	0.09	.03	3.26	.001
Science knowledge	-0.04	.02	-1.91	.056
Skepticism (pre-test)	0.85	.02	58.16	.000
Condition × science knowledge	0.01	.03	0.24	.810

Supplemental Table 42*Condition x Spirituality, GM skepticism, controlling for pre-test skepticism*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.05	.02	-2.41	.016
Condition (distant = 1)	0.09	.03	3.38	.001

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Spirituality	0.04	.02	2.13	.033
Skepticism (pre-test)	0.86	.01	60.38	.000
Condition × spirituality	-0.01	.03	-0.42	.674

Supplemental Materials F. Descriptives and correlations, Study 3

Supplemental Table 43

Means, standard deviations, and correlations with confidence intervals, Study 3

Variable	<i>M</i>	<i>SD</i>	1	2	3
1. Concreteness (pre)	4.25	1.17	-		
2. Concreteness (post)	4.48	1.07	.29*** [.23, .35]		
3. Personal relevance (pre)	4.28	1.31	.27*** [.21, .33]	.10** [.03, .16]	
4. Personal relevance (post)	4.78	1.32	.19*** [.13, .25]	.18*** [.12, .24]	.56*** [.52, .60]

Note. Values in square brackets indicate the 95% confidence interval for each correlation.

** indicates $p < .01$. *** indicates $p < .001$.

Supplemental Materials G. Descriptives and correlations, Study 4

Supplemental Table 44

Means, standard deviations, and correlations with confidence intervals, Study 4

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. Relevance (pre)	4.09	1.34										
2. Relevance (pre)	4.83	1.23	.54*** [.50, .58]									
3. GM skept. (pre)	3.82	1.23	-.18*** [-.23, -.12]	-.12*** [-.18, -.07]								
4. GM skept. (post)	3.66	1.16	-.15*** [-.21, -.09]	-.15*** [-.20, -.09]	.83*** [.81, .85]							
5. Attitude valence (pre)	3.81	1.58	.22*** [.16, .27]	.14*** [.08, .19]	-.84*** [-.85, -.82]	-.73*** [-.75, -.70]						
6. Attitude valence (post)	4.35	1.39	.19*** [.14, .25]	.18*** [.12, .23]	-.73*** [-.75, -.70]	-.84*** [-.86, -.82]	.71*** [.68, .74]					
7. Credibility (pre)	4.14	1.52	.23*** [.17, .28]	.16** [.10, .21]	-.79*** [-.81, -.77]	-.70*** [-.73, -.67]	.87*** [.86, .89]	.66*** [.63, .69]				
8. Credibility (post)	4.68	1.23	.17***	.17***	-.63***	-.74***	.59***	.82***	.62*v*			

9. Spirituality	2.63	1.64	.07*	.07*	.20***	.21***	-.16***	-.17***	-.15***	-.13***		
			[.01, .13]	[.02, .13]	[.14, .25]	[.15, .26]	[-.22, -.11]	[-.22, -.11]	[-.21, -.09]	[-.19, -.07]		
10. Trust in scientists	3.65	0.83	.13***	.14***	-.57***	-.56***	.50***	.49***	.53***	.48***	-.17***	
			[.08, .19]	[.08, .19]	[-.60, -.53]	[-.60, -.52]	[.46, .54]	[.45, .53]	[.49, .57]	[.44, .53]	[-.23, -.12]	
11. GM knowledge	3.88	1.88	.21***	.11***	-.28***	-.28***	.28***	.25***	.31***	.24***	-.17***	.25***
			[.15, .26]	[.05, .17]	[-.33, -.23]	[-.33, -.23]	[.23, .33]	[.19, .30]	[.26, .36]	[.18, .29]	[-.22, -.11]	[.19, .30]

Note. GM = genetic modification of food. skept = skepticism.

Values in square brackets indicate the 95% confidence interval for each correlation.

* indicates $p < .05$. *** indicates $p < .01$.

Supplemental Materials H. Mediation models results, Study 4

Supplemental Table 45

Parameter Bs for skepticism mediation

		label	<i>B</i> [95% CI]	<i>SE</i>	<i>z</i>	<i>p</i>
Regression of personal relevance (post-test)						
~	Condition	a	-0.31 [-0.44, 0.20]	0.06	-5.26	.000
~	Relevance (pre)		0.49 [0.45, 0.54]	0.02	20.42	.000
Regression of GM skepticism (post-test)						
~	Condition	c	0.04 [-0.04, .11]	0.04	0.99	.321
~	Relevance (post)	b	-0.05 [-0.10, -0.01]	0.02	-2.44	.015
~	Skepticism (pre)		0.78 [0.75, 0.81]	0.02	48.49	.000
~	Relevance (pre)		0.03 [-0.01, 0.07]	0.02	1.26	.209
Covariances						
Relevance (pre-test)	~	Skepticism (pre)	-0.30 [-0.41, -0.19]	0.06	-5.29	.000
Variiances						
		Relevance (post)	1.05 [0.97, 1.15]	0.05	22.98	.000
		Skepticism (post)	0.41 [0.36, 0.47]	0.03	16.08	.000
		Relevance (pre)	1.80 [1.68, 1.93]	0.06	28.14	.000
		Skepticism (pre)	1.52 [1.41, 1.64]	0.06	25.96	.000
Mediation model paths						
	a*b	ab	0.02 [0.00, 0.03]	0.01	2.30	.021
	c+(a*b)	total	0.06 [-0.02, 0.13]	0.04	1.46	.144

Supplemental Table 46

Parameter Bs for attitude valence mediation

		label	<i>B</i> [95% CI]	<i>SE</i>	<i>z</i>	<i>p</i>
Regression of personal relevance (post-test)						
~	Condition	a	-0.32 [-0.44, -0.20]	0.06	-5.26	.000
~	Relevance (pre)		0.50 [0.45, 0.54]	0.02	20.42	.000
Regression of valence (post-test)						
~	Condition	c	-0.05 [-0.16, 0.07]	0.06	-0.81	.417
~	Relevance (post)	b	0.09 [0.02, 0.15]	0.03	2.54	.011
~	Valence (pre)		0.62 [0.58, 0.66]	0.02	29.85	.000
~	Relevance (pre)		-0.00 [-0.06, 0.06]	0.03	-0.07	.946
Covariances						
Relevance (pre)	Valence (pre)	~~	0.47 [0.33, 0.60]	0.07	6.70	.000
Variances						
	Relevance (post)	~~	1.05 [0.97, 1.15]	0.05	22.98	.000
	Valence (post)	~~	0.94 [0.85, 1.03]	0.05	20.46	.000
	Relevance (pre)	~~	1.80 [1.68, 1.93]	0.06	28.14	.000
	Valence (pre)	~~	2.51 [2.35, 2.67]	0.08	30.85	.000
Mediation model paths						
	a*b	ab	-0.03 [-0.05, -0.01]	0.01	-2.33	.020
	c+(a*b)	total	-0.07 [-0.18, 0.04]	0.06	-1.33	.185

Supplemental Table 47

Parameter Bs for credibility mediation

		label	B	SE	z	p
Regression of personal relevance (post-test)						
~	Condition	a	-0.32 [-0.44, -0.20]	0.06	-5.26	.000
~	Relevance (pre)		0.49 [0.45, 0.54]	0.02	20.42	.000
Regression of credibility (post-test)						
~	Condition	c	-0.03 [-0.14, 0.09]	0.06	-0.49	.627
~	Relevance (post)	b	0.09 [0.02, 0.15]	0.03	2.57	.010
~	Credibility (pre)		0.50 [0.45, 0.54]	0.02	22.24	.000
~	Relevance (pre)		-0.02 [-0.08, 0.04]	0.03	-0.64	.521
Covariances						
Relevance (pre)	~~	Credibility (pre)	0.47 [0.34, 0.61]	0.07	6.78	.000
Variances						
~~	Relevance (post)		1.05 [0.97, 1.15]	0.05	22.98	.000
~~	Credibility (post)		0.91 [0.83, 1.00]	0.04	20.78	.000
~~	Relevance (pre)		1.80 [1.68, 1.93]	0.06	28.14	.000
~~	Credibility (pre)		2.32 [2.16, 2.48]	0.08	28.40	.000
Mediation model paths						
a*b		ab	-0.03 [-0.05, -0.01]	0.01	-2.36	.018
c+(a*b)		total	-0.06 [-0.16, 0.06]	0.06	-0.99	.321

**Supplemental Materials I. trust in scientists, science knowledge, and spirituality as
potential moderators, Study 4**

We tested GM-specific knowledge, general trust in scientists, and spirituality as potential moderators of the effect of distance on attitude valence and skepticism. To do so, like in Study 2, we employed an ANCOVA for each of the DVs, controlling for pre-test DV, the main effect of the potential moderator and condition, as well as their interaction term. None of the tested interactions were significant (all $ps > .087$). Detailed results of all moderation analyses are available in Supplemental Materials I (Supplemental Table 48-56).

Combined with very limited evidence for moderation effects from Study 1 and no detected effects in Study 2, these results again support the notion that the PSYDISC messages we used affect people with various levels of science knowledge, trust in scientists and spirituality equally.

Supplemental Table 48

Condition x Trust in Science interaction, GM attitude valence

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.02	.03	-0.76	.449
Condition (distant = 1)	0.04	.04	1.07	.285
Trust in scientists	0.19	.03	6.17	.000
Attitude valence (pre-test)	0.62	.02	27.30	.000
Condition × trust in scientists	0.02	.04	0.54	.590

Supplemental Table 49*Condition x GM knowledge, GM attitude valence, controlling for pre-test valence*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.02	0.03	-0.86	.391
Condition (distant = 1)	0.05	0.04	1.21	.228
GM food knowledge	0.12	0.03	4.14	.000
Attitude valence (pre-test)	0.69	0.02	33.10	.000
Condition × GM food knowledge	-0.01	0.04	-0.31	.754

Supplemental Table 50*Condition x Spirituality, GM attitude valence, controlling for pre-test valence*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.02	.03	-0.68	.494
Condition (distant = 1)	0.04	.04	1.03	.305
Spirituality	-0.08	.03	-2.70	.007
Attitude valence (pre-test)	0.71	.02	34.31	.000
Condition × spirituality	0.07	.04	1.71	.087

Supplemental Table 51*Condition x Trust in Scientists, GM credibility, controlling for pre-test credibility*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.01	.03	-0.32	.753

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Condition (distant = 1)	0.02	.04	0.45	.653
Trust in scientists	0.27	.03	8.13	.000
Credibility (pre-test)	0.48	.02	19.69	.000
Condition × trust in scientists	0.06	.04	1.35	.178

Supplemental Table 52

Condition x GM Knowledge, GM credibility, controlling for pre-test credibility

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.01	.03	-0.45	.656
Condition (distant = 1)	0.03	.04	0.66	.508
GM food knowledge	0.14	.03	4.30	.000
Credibility (pre-test)	0.59	.02	25.68	.000
Condition × GM food knowledge	0.07	.04	1.63	.103

Supplemental Table 53

Condition x Spirituality, GM credibility, controlling for pre-test credibility

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.01	.03	-0.27	.786
Condition (distant = 1)	0.02	.05	0.41	.680
Spirituality	-0.09	.03	-2.79	.005
Credibility (pre-test)	0.62	.02	27.00	.000
Condition × spirituality	0.04	.05	0.81	.420

Supplemental Table 54*Condition x Trust, GM skepticism, controlling for pre-test skepticism*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.02	.02	-0.97	.333
Condition (distant = 1)	0.04	.03	1.37	.172
Trust in scientists	-0.13	.03	-5.42	.000
Skepticism (pre-test)	0.76	.02	39.71	.000
Condition × trust in scientists	0.00	.03	0.12	.903

Supplemental Table 55*Condition x GM Knowledge, GM skepticism, controlling for pre-test skepticism*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.02	.02	-0.97	.333
Condition (distant = 1)	0.04	.03	1.39	.166
GM food knowledge	-0.07	.02	-2.85	.004
Skepticism (pre-test)	0.82	.02	49.07	.000
Condition × GM food knowledge	0.03	.03	0.94	.350

Supplemental Table 56*Condition x Spirituality, GM skepticism, controlling for pre-test skepticism*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	-0.03	.02	-1.12	.263
Condition (distant = 1)	0.05	.03	1.57	.118

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Spirituality	0.05	.02	2.41	.016
Skepticism (pre-test)	0.82	.02	50.43	.000
Condition × spirituality	-0.01	.03	-0.38	.705
