Supplementary Materials: Simulated Data

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Author Note

All procedures performed in studies involving human participants were approved by the Institutional Research Ethics Committee and conducted in accordance with the Code of Professional Ethics of the Psychological Society of Ireland and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study. The authors declare that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Abstract

Moral dumbfounding occurs when people maintain a moral judgment in the absence of supporting reasons. Drawing on dual-process approaches to moral judgment, one possible explanation for moral dumbfounding proposes that it occurs as a result of a conflict between intuitive and deliberative processes. Consistent with this explanation, previous research has shown that under manipulations designed to lead to more intuitive thinking rather than deliberative thinking (such as increased cognitive load), people are less likely to provide reasons for their judgments, and more likely to provide dumbfounded responses in a moral dumbfounding task. Building on this work the present research examines if dumbfounded responding can be reduced through experimental manipulations designed to facilitate deliberative thinking (over intuitive thinking). Drawing on construal-level theory, and the finding that distancing facilitates deliberative thinking, we predict that including a distancing manipulation in a moral dumbfounding task will increase reason-giving, and reduce dumbfounded responding. We propose a pre-registered study to test this prediction.

Keywords: moral dumbfounding, distancing, construal-level theory, dual-processes, reasons, intuitions

Supplementary Materials: Simulated Data

Analysis of Simulated Data

The following is a sample analysis using a simulated data set. This simulated data set contains $N = 4800$ participants. This sample size was chosen in order for at least 400 participants at each level of the temporal distance IV when analysing the scenarios separately (i.e., aiming for $n = 1200$ per scenario). This sample size will also allow for the detection of a medium effect in the combined analysis on the entire sample.

```
       control future now
other      800    800 800
self       800    800 800
```

Temporal Distancing and Dumbfounding

Overview of Judgments. A total of 3408 participants (71%) rated the behavior of Julie and Mark as wrong initially, and 3218 participants (67.04%) rated the behavior as wrong at the end of the task. There was a significant difference between initial ratings ($M = 3.3$, $SD = 1.3$) and revised ratings ($M = 3.4$, $SD = 1.4$), $t(4799) =$ -4.04, $p < .001$, $d = 0.06$.

Distancing and Judgments Made. There was no difference in initial judgement depending on distance manipulation: $F(2, 4797) = 1.34$, $p = .263$ ${\eta_p}^2 = 0.001$, ($M_{\text{increased}} = 3.3$, $SD_{\text{increased}} = 1.3$, $M_{\text{decreased}} = 3.3$, $SD_{\text{decreased}} = 1.3$, $M_{\text{control}} = 3.2$, $SD_{\text{control}} = 1.3$). There was no difference in revised judgement depending on distance manipulation: $F(2, 4797) = 2.34$, $p = .096$, ${\eta_p}^2 = 0.001$, ($M_{\text{increased}} = 3.4$, $SD_{\text{increased}} = 1.4$, $M_{\text{decreased}} = 3.4$, $SD_{\text{decreased}} = 1.4$, $M_{\text{control}} = 3.3$, $SD_{\text{control}} = 1.4$).

Distancing and Reason-Giving/Dumbfounding. There was a significant association between temporal distance condition and response to the critical slide, $\chi^2(4, N = 4800) = 109.171$, $p < .001$, $V = 0.15$, the observed power was 1. The responses to the critical slide for the increased distance group ($N = 1600$) the decreased distance group ($N = 1600$), and the control group ($N = 1600$) are displayed in Figure 1.

Figure 1

Simulated Data: Responses to critical slide depending on temporal distance for the increased temporal distance group (future, N = 1,600), for the decreased temporal distance group (today, N = 1,600), and for the control group (N = 1,600) (error bars represent standard error of the proportion)

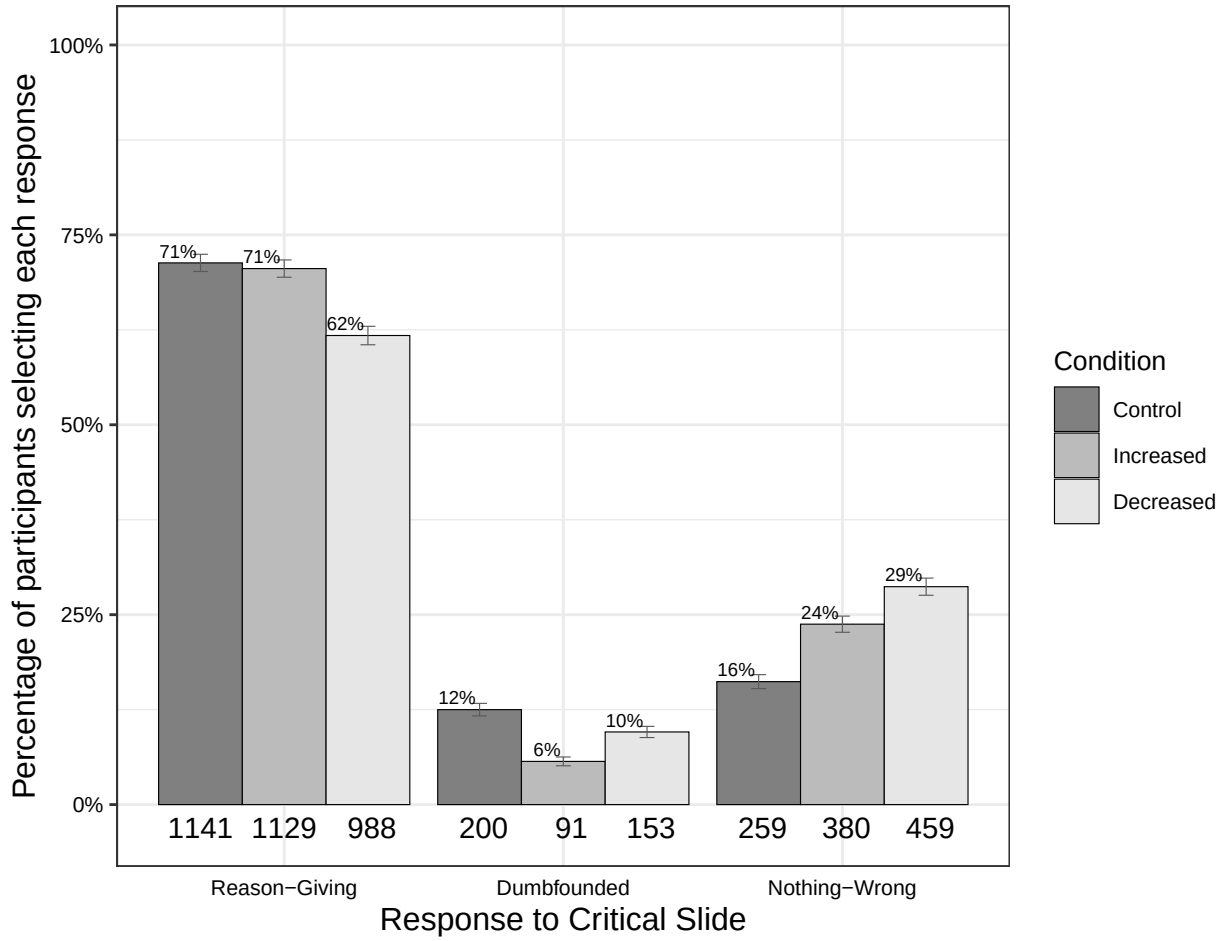


Table 1

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on temporal distancing

		Control	Increased	Decreased
Observed count	Reasons	1141	1129	988
	Dumbfounded	200	91	153
	Nothing Wrong	259	380	459
Expected count	Reasons	1086	1086	1086
	Dumbfounded	148	148	148
	Nothing Wrong	366	366	366
Standardised residuals	Reasons	3.61**	2.82*	-6.43**
	Dumbfounded	5.5**	-6.02**	0.53
	Nothing Wrong	-7.8**	1.02	6.78**

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$

Social Distancing and Dumbfounding

Overview of Judgments. A total of 3408 participants (71%) rated the behavior of Julie and Mark as wrong initially, and 3218 participants (67.04%) rated the behavior as wrong at the end of the task. There was a significant difference between initial ratings ($M = 3.3$, $SD = 1.3$) and revised ratings ($M = 3.4$, $SD = 1.4$), $t(4799) =$ -4.04, $p < .001$, $d = 0.06$.

Distancing and Judgments Made. There was no difference in initial judgement depending on distance manipulation: $t(4797.95) = 1.29$, $p = .198$, $d = 0.04$, ($M_{\text{increased}} = 3.3$, $SD_{\text{increased}} = 1.3$, $M_{\text{decreased}} = 3.3$, $SD_{\text{decreased}} = 1.3$). There was no difference in revised judgement depending on distance manipulation: $t(4797.95) =$ -0.56, $p = .577$, $d = 0.02$, ($M_{\text{increased}} = 3.4$, $SD_{\text{increased}} = 1.4$, $M_{\text{decreased}} = 3.4$, $SD_{\text{decreased}} = 1.4$).

Distancing and Reason-Giving/Dumbfounding. There was a significant association between temporal distance condition and response to the critical slide, $\chi^2(2, N = 4800) = 22.444$, $p < .001$, $V = 0.07$, the observed power was 0.99. The responses to the critical slide for the increased distance group ($N = 2400$) and the decreased distance group ($N = 2400$) are displayed in Figure 2.

Figure 2

Simulated Data: Responses to critical slide depending on social distance for the increased social distance group (future, N = 2,400), and for the decreased social distance group (today, N = 2,400), (error bars represent standard error of the proportion)

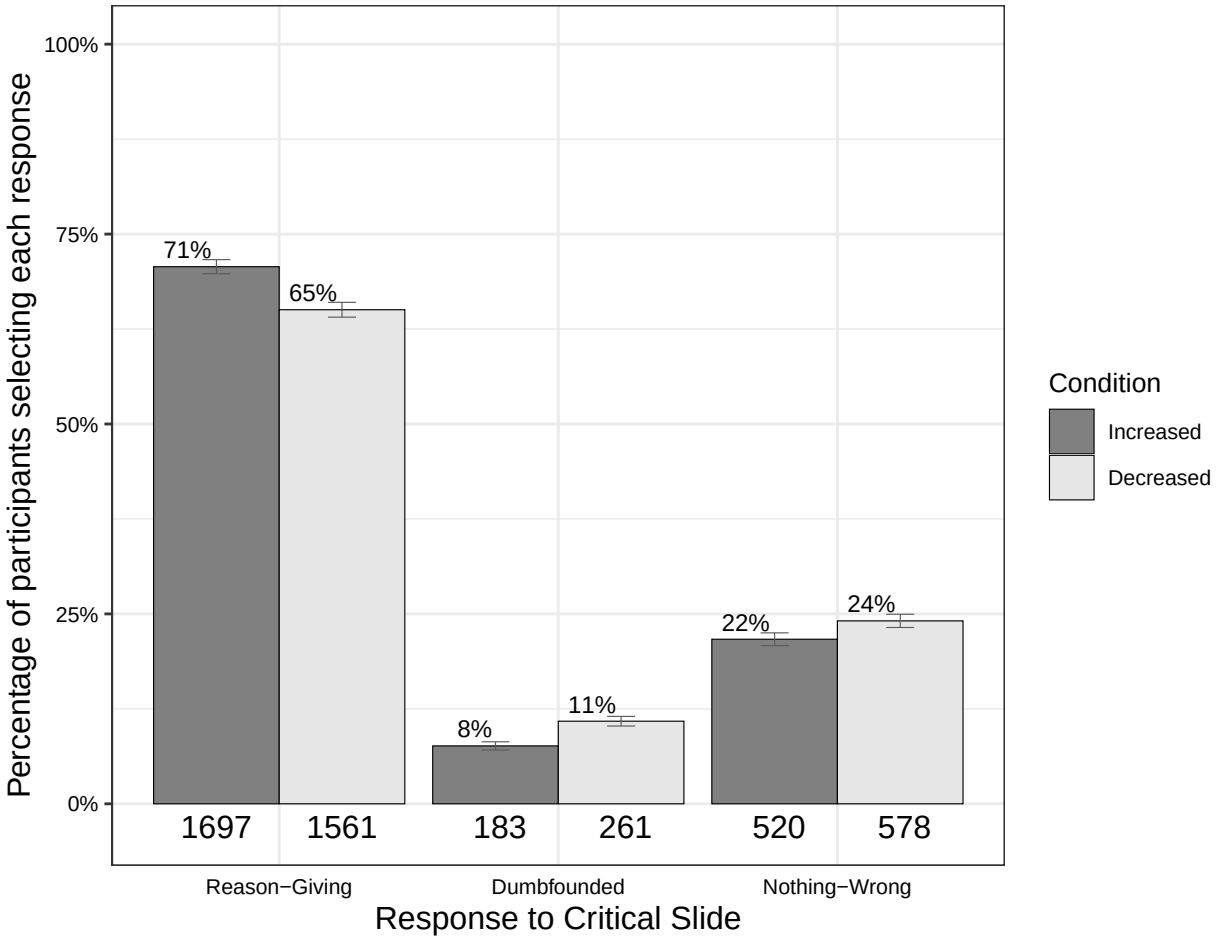


Table 2

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on social distancing

		Increased	Decreased
Observed count	Reasons	1697	1561
	Dumbfounded	183	261
	Nothing Wrong	520	578
Expected count	Reasons	1629	1629
	Dumbfounded	222	222
	Nothing Wrong	549	549
Standardised residuals	Reasons	4.2**	-4.2**
	Dumbfounded	-3.89**	3.89**
	Nothing Wrong	-1.99*	1.99*

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$

Distancing and Dumbfounding

Without Scenario

Overall the model significantly predicted responses to the critical slide $\chi^2(10, N = 4800) = 150.29$, $p < .001$, The observed power was 1. The model explained between 1.04% (Cox and Snell R square) and 2.46% (Nadelkerke R squared) of the variance in responses to the critical slide. For scenarios in the future, participants were more likely to provide reasons than to present as dumbfounded Wald = -7.56, $p < .001$, odds ratio = 0.45, 95% CI [0.3, 0.68].

Table 3

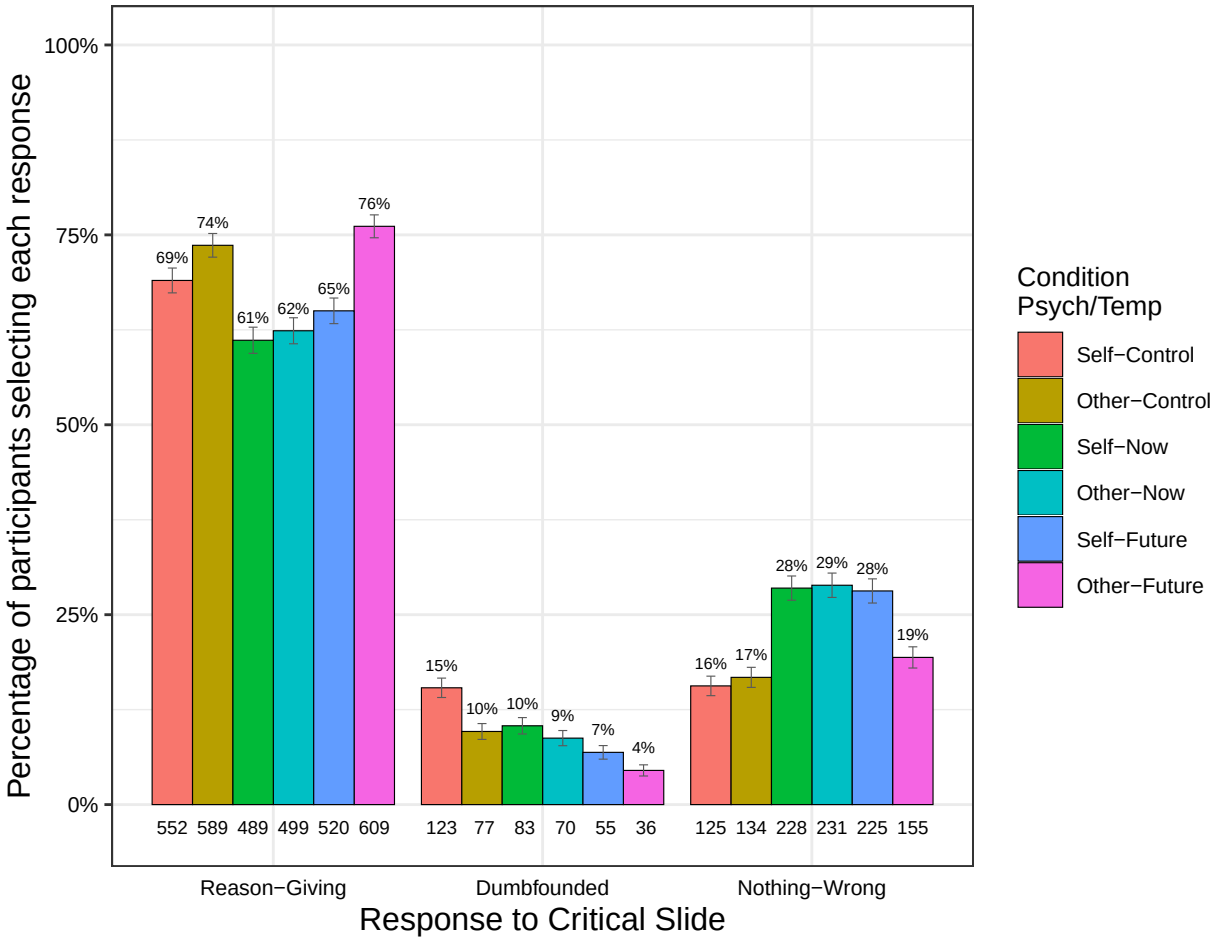
Predictors of each response with reason-giving as the reference response

Response	Term	*b*	*S.E.*	*z*	Wald	*p*	*O.R.*	Lower	Upper
D	(Intercept)	-2.03	0.12	-16.79	-33.58	< .001**	0.13	0.10	0.17
D	Soc-Self	0.53	0.16	3.40	6.80	< .001**	1.70	1.25	2.32
D	Temp-Future	-0.79	0.21	-3.78	-7.56	< .001**	0.45	0.30	0.68
D	Temp-Now	0.07	0.18	0.40	0.80	0.689	1.07	0.76	1.52
D	Soc-Self × Temp-Future	0.05	0.27	0.18	0.36	0.858	1.05	0.62	1.79
D	Soc-Self × Temp-Now	-0.34	0.23	-1.46	-2.92	0.144	0.71	0.45	1.12
NW	(Intercept)	-1.48	0.10	-15.47	-30.94	< .001**	0.23	0.19	0.27
NW	Soc-Self	0.00	0.14	-0.03	-0.07	0.973	1.00	0.76	1.30
NW	Temp-Future	0.11	0.13	0.85	1.71	0.393	1.12	0.86	1.45
NW	Temp-Now	0.71	0.12	5.71	11.41	< .001**	2.03	1.59	2.60
NW	Soc-Self × Temp-Future	0.54	0.18	2.93	5.86	.003*	1.71	1.19	2.44
NW	Soc-Self × Temp-Now	0.01	0.18	0.07	0.13	0.947	1.01	0.71	1.43

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$; D = dumbfounded, NW = nothing-wrong

Figure 3

Simulated Data: Responses to critical slide depending on both manipulations. Sample sizes as follows: Self-Control, N = 800, Other-Control, N = 800, Self-Now, N = 800, Other-Now, N = 800, Self-Future, N = 800, Other-Future, N = 800, (error bars represent standard error of the proportion)



Including Scenario

Overall the model significantly predicted responses to the critical slide $\chi^2(16, N = 4800) = 201.07$, $p < .001$, The observed power was 1. The model explained between 1.39% (Cox and Snell R square) and 3.29% (Nadelkerke R squared) of the variance in responses to the critical slide. For scenarios in the future, participants were more likely to provide reasons than to present as dumbfounded Wald = -7.62, $p < .001$, odds ratio = 0.45, 95% CI [0.3, 0.68].

Table 4

Predictors of each response with reason-giving as the reference response

Response	Term	*b*	*S.E.*	*z*	Wald	*p*	*O.R.*	Lower	Upper
D	(Intercept)	-1.93	0.15	-12.88	-25.76	< .001**	0.15	0.11	0.20
D	Soc-Self	0.53	0.16	3.38	6.77	< .001**	1.70	1.25	2.32
D	Temp-Future	-0.80	0.21	-3.81	-7.62	< .001**	0.45	0.30	0.68
D	Temp-Now	0.05	0.18	0.27	0.54	0.788	1.05	0.74	1.48
D	Scenario-Jennifer	-0.24	0.14	-1.65	-3.30	0.099	0.79	0.60	1.05
D	Scenario-Julie and Mark	0.20	0.14	1.47	2.95	0.141	1.22	0.94	1.59
D	Scenario-Trolley	-0.47	0.16	-2.99	-5.97	.003*	0.62	0.46	0.85
D	Soc-Self × Temp-Future	0.05	0.27	0.17	0.35	0.862	1.05	0.61	1.79
D	Soc-Self × Temp-Now	-0.32	0.24	-1.35	-2.69	0.178	0.73	0.46	1.16
NW	(Intercept)	-1.35	0.11	-11.93	-23.86	< .001**	0.26	0.21	0.32
NW	Soc-Self	-0.01	0.14	-0.08	-0.17	0.933	0.99	0.75	1.30
NW	Temp-Future	0.11	0.13	0.82	1.63	0.415	1.11	0.86	1.44
NW	Temp-Now	0.72	0.12	5.73	11.46	< .001**	2.05	1.60	2.61
NW	Scenario-Jennifer	-0.43	0.10	-4.17	-8.34	< .001**	0.65	0.54	0.80
NW	Scenario-Julie and Mark	-0.14	0.10	-1.36	-2.72	0.175	0.87	0.72	1.06
NW	Scenario-Trolley	0.04	0.10	0.39	0.77	0.7	1.04	0.86	1.26
NW	Soc-Self × Temp-Future	0.54	0.18	2.95	5.90	.003*	1.72	1.20	2.46
NW	Soc-Self × Temp-Now	0.01	0.18	0.05	0.10	0.96	1.01	0.71	1.43

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$; D = dumbfounded, NW = nothing-wrong

Results for Each Scenario

Julie and Mark

Temporal Distancing and Dumbfounding.

Overview of Judgments. A total of 840 participants (70%) rated the behavior of Julie and Mark as wrong initially, and 792 participants (66%) rated the behavior as wrong at the end of the task. There was a significant difference between initial ratings (M = 3.3, SD = 1.3) and revised ratings (M = 3.4, SD = 1.4), $t(1199)$ = -2.13, p = .034, d = 0.06.

Distancing and Judgments Made. There was no difference in initial judgement depending on distance manipulation: $F(2, 1197) = 0.89$, p = .410 ${\eta_p}^2$ = 0.001, ($M_{\text{increased}}$ = 3.3, $SD_{\text{increased}}$ = 1.4, $M_{\text{decreased}}$ = 3.3, $SD_{\text{decreased}}$ = 1.3, M_{control} = 3.2, SD_{control} = 1.2). There was no difference in revised judgement depending on distance manipulation: $F(2, 1197) = 0.98$, p = .375, ${\eta_p}^2$ = 0.002, ($M_{\text{increased}}$ = 3.5, $SD_{\text{increased}}$ = 1.4, $M_{\text{decreased}}$ = 3.4, $SD_{\text{decreased}}$ = 1.3, M_{control} = 3.3, SD_{control} = 1.4).

Distancing and Reason-Giving/Dumbfounding. There was a significant association between temporal distance condition and response to the critical slide, $\chi^2(4, N = 1200) = 13.825$, p = .008, V = 0.11, the observed power was 0.89. The responses to the critical slide for the increased distance group (N = 402) the decreased distance group (N = 413), and the control group (N = 385) are displayed in Figure 4.

Table 5

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on temporal distancing

		Control	Increased	Decreased
Observed count	Reasons	269	274.00	247
	Dumbfounded	49	40.00	55
	Nothing Wrong	67	88.00	111
Expected count	Reasons	253.46	264.65	271.89
	Dumbfounded	46.2	48.24	49.56
	Nothing Wrong	85.34	89.11	91.55
Standardised residuals	Reasons	2.03*	1.21	-3.19*
	Dumbfounded	0.53	-1.55	1.02
	Nothing Wrong	-2.73*	-0.16	2.85*

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$

Social Distancing and Dumbfounding.

Overview of Judgments. A total of 840 participants (70%) rated the behavior of Julie and Mark as wrong initially, and 792 participants (66%) rated the behavior as wrong at the end of the task. There was a significant difference between initial ratings (M = 3.3, SD = 1.3) and revised ratings (M = 3.4, SD = 1.4), $t(1199)$ = -2.13, p = .034, d = 0.06.

Distancing and Judgments Made. There was no difference in initial judgement depending on distance manipulation: $t(1196.23)$ = -0.2, p = .844, d = 0.01, ($M_{\text{increased}}$ = 3.3, $SD_{\text{increased}}$ = 1.3, $M_{\text{decreased}}$ = 3.3, $SD_{\text{decreased}}$ = 1.3). There was no difference in revised judgement depending on distance manipulation: $t(1193.87)$ = -0.28, p = .781, d = 0.02, ($M_{\text{increased}}$ = 3.4, $SD_{\text{increased}}$ = 1.4, $M_{\text{decreased}}$ = 3.4, $SD_{\text{decreased}}$ = 1.4).

Distancing and Reason-Giving/Dumbfounding. There was a significant association between temporal distance condition and response to the critical slide, $\chi^2(2, N = 1200) = 4.857$, p = .088, V = 0.06, the observed power was 0.43. The responses to the critical slide for the increased distance group (N = 616) and the decreased distance group (N = 584) are displayed in Figure 5.

Table 6

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on social distancing

		Increased	Decreased
Observed count	Reasons	423	367
	Dumbfounded	65	79
	Nothing Wrong	128	138
Expected count	Reasons	405.53	384.47
	Dumbfounded	73.92	70.08
	Nothing Wrong	136.55	129.45
Standardised residuals	Reasons	2.13*	-2.13*
	Dumbfounded	-1.59	1.59
	Nothing Wrong	-1.19	1.19

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$

Combined Effects of both Distance Manipulations

A multinomial logistic regression was conducted to examine the combined effects of both temporal and social distance on responses to the critical slide. Overall the model significantly predicted responses to the critical slide $\chi^2(10, N = 1200) = 28.17$, $p = .002$, The observed power was 0.98. The model explained between 0.78% (Cox and Snell R square) and 1.78% (Nadelkerke R squared) of the variance in responses to the critical slide. For scenarios in the future, participants were more likely to provide reasons than to present as dumbfounded Wald = 0.05, $p = .979$, odds ratio = 1.01, 95% CI [0.5, 2.04].

Table 7

Predictors of each response with reason-giving as the reference response

Response	Term	*b*	*S.E.*	*z*	Wald	*p*	*O.R.*	Lower	Upper
D	(Intercept)	-2.14	0.26	-8.33	-16.66	< .001**	0.12	0.07	0.20
D	Soc-Self	0.77	0.32	2.39	4.78	.017*	2.17	1.15	4.09
D	Temp-Future	0.01	0.36	0.03	0.05	0.979	1.01	0.50	2.04
D	Temp-Now	0.69	0.33	2.10	4.19	.036*	1.99	1.05	3.77
D	Soc-Self × Temp-Future	-0.37	0.47	-0.78	-1.57	0.433	0.69	0.28	1.74
D	Soc-Self × Temp-Now	-0.88	0.44	-2.00	-4.01	.045*	0.41	0.17	0.98
NW	(Intercept)	-1.47	0.19	-7.63	-15.27	< .001**	0.23	0.16	0.33
NW	Soc-Self	0.17	0.27	0.63	1.25	0.531	1.19	0.69	2.03
NW	Temp-Future	-0.02	0.27	-0.06	-0.13	0.948	0.98	0.58	1.67
NW	Temp-Now	0.73	0.25	2.95	5.91	.003*	2.08	1.28	3.38
NW	Soc-Self × Temp-Future	0.50	0.37	1.34	2.68	0.18	1.64	0.79	3.40
NW	Soc-Self × Temp-Now	-0.30	0.36	-0.83	-1.67	0.405	0.74	0.37	1.49

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$; D = dumbfounded, NW = nothing-wrong

Jennifer

Temporal Distancing and Dumbfounding.

Overview of Judgments. A total of 908 participants (72.7%) rated the behavior of Julie and Mark as wrong initially, and 826 participants (66.13%) rated the behavior as wrong at the end of the task. There was a significant difference between initial ratings (M = 3.2, SD = 1.3) and revised ratings (M = 3.4, SD = 1.4), $t(1248)$ = -4.11, $p < .001$, d = 0.12.

Distancing and Judgments Made. There was no difference in initial judgement depending on distance manipulation: $F(2, 1246) = 0.87$, $p = .419$ ${\eta_p}^2 = 0.001$, ($M_{\text{increased}} = 3.2$, $SD_{\text{increased}} = 1.3$, $M_{\text{decreased}} = 3.3$, $SD_{\text{decreased}} = 1.3$, $M_{\text{control}} = 3.2$, $SD_{\text{control}} = 1.3$). There was no difference in revised judgement depending on distance manipulation: $F(2, 1246) = 0.35$, $p = .704$, ${\eta_p}^2 = 0.001$, ($M_{\text{increased}} = 3.4$, $SD_{\text{increased}} = 1.5$, $M_{\text{decreased}} = 3.5$, $SD_{\text{decreased}} = 1.4$, $M_{\text{control}} = 3.4$, $SD_{\text{control}} = 1.4$).

Distancing and Reason-Giving/Dumbfounding. There was a significant association between temporal distance condition and response to the critical slide, $\chi^2(4, N = 1249) = 25.303$, $p < .001$, $V = 0.14$, the observed power was 0.99. The responses to the critical slide for the increased distance group (N = 405) the decreased distance group (N = 416), and the control group (N = 428) are displayed in Figure 4.

Table 8

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on temporal distancing

		Control	Increased	Decreased
Observed count	Reasons	331	300	281
	Dumbfounded	47	26	36
	Nothing Wrong	50	79	99
Expected count	Reasons	312.52	295.72	303.76
	Dumbfounded	37.35	35.34	36.3
	Nothing Wrong	78.13	73.93	75.94
Standardised residuals	Reasons	2.48*	0.58	-3.08*
	Dumbfounded	2.04*	-2*	-0.06
	Nothing Wrong	-4.34**	0.79	3.58**

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$

Social Distancing and Dumbfounding.

Overview of Judgments. A total of 908 participants (72.7%) rated the behavior of Julie and Mark as wrong initially, and 826 participants (66.13%) rated the behavior as wrong at the end of the task. There was a significant difference between initial ratings ($M = 3.2$, $SD = 1.3$) and revised ratings ($M = 3.4$, $SD = 1.4$), $t(1248) =$ -4.11, $p < .001$, $d = 0.12$.

Distancing and Judgments Made. There was no difference in initial judgement depending on distance manipulation: $t(1246.82) = 0.49$, $p = .627$, $d = 0.03$, ($M_{\text{increased}} = 3.2$, $SD_{\text{increased}} = 1.3$, $M_{\text{decreased}} = 3.2$, $SD_{\text{decreased}} = 1.3$). There was no difference in revised judgement depending on distance manipulation: $t(1246.54) =$ -0.62, $p = .534$, $d = 0.04$, ($M_{\text{increased}} = 3.4$, $SD_{\text{increased}} = 1.4$, $M_{\text{decreased}} = 3.5$, $SD_{\text{decreased}} = 1.4$).

Distancing and Reason-Giving/Dumbfounding. There was a significant association between temporal distance condition and response to the critical slide, $\chi^2(2, N = 1249) = 4.936$, $p = .085$, $V = 0.06$, the observed power was 0.44. The responses to the critical slide for the increased distance group ($N = 637$) and the decreased distance group ($N = 612$) are displayed in Figure 5.

Table 9

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on social distancing

		Increased	Decreased
Observed count	Reasons	478	434
	Dumbfounded	45	64
	Nothing Wrong	114	114
Expected count	Reasons	465.13	446.87
	Dumbfounded	55.59	53.41
	Nothing Wrong	116.28	111.72
Standardised residuals	Reasons	1.64	-1.64
	Dumbfounded	-2.12*	2.12*
	Nothing Wrong	-0.33	0.33

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$

Combined Effects of both Distance Manipulations

A multinomial logistic regression was conducted to examine the combined effects of both temporal and social distance on responses to the critical slide. Overall the model significantly predicted responses to the critical slide $\chi^2(10, N = 1249) = 38.57$, $p < .001$, The observed power was 1. The model explained between 1.02% (Cox and Snell R square) and 2.6% (Nadelkerke R squared) of the variance in responses to the critical slide. For scenarios in the future, participants were more likely to provide reasons than to present as dumbfounded Wald = -3.21, $p = .108$, odds ratio = 0.52, 95% CI [0.24, 1.15].

Table 10

Predictors of each response with reason-giving as the reference response

Response	Term	*b*	*S.E.*	*z*	Wald	*p*	*O.R.*	Lower	Upper
D	(Intercept)	-2.16	0.24	-9.14	-18.27	< .001**	0.12	0.07	0.18
D	Soc-Self	0.39	0.31	1.24	2.48	0.214	1.48	0.80	2.74
D	Temp-Future	-0.65	0.40	-1.61	-3.21	0.108	0.52	0.24	1.15
D	Temp-Now	-0.08	0.36	-0.21	-0.42	0.833	0.93	0.46	1.88
D	Soc-Self × Temp-Future	0.28	0.52	0.53	1.07	0.594	1.32	0.47	3.70
D	Soc-Self × Temp-Now	-0.06	0.48	-0.13	-0.26	0.897	0.94	0.37	2.40
NW	(Intercept)	-1.86	0.21	-8.98	-17.95	< .001**	0.16	0.10	0.23
NW	Soc-Self	-0.07	0.30	-0.23	-0.46	0.819	0.93	0.51	1.69
NW	Temp-Future	0.19	0.28	0.65	1.30	0.515	1.20	0.69	2.10
NW	Temp-Now	0.94	0.26	3.61	7.23	< .001**	2.56	1.54	4.27
NW	Soc-Self × Temp-Future	0.71	0.40	1.77	3.55	0.076	2.03	0.93	4.43
NW	Soc-Self × Temp-Now	-0.20	0.38	-0.52	-1.05	0.6	0.82	0.38	1.74

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$; D = dumbfounded, NW = nothing-wrong

Trolley

Temporal Distancing and Dumbfounding.

Overview of Judgments. A total of 848 participants (71.93%) rated the behavior of Julie and Mark as wrong initially, and 793 participants (67.26%) rated the behavior as wrong at the end of the task. There was a significant difference between initial ratings (M = 3.3, SD = 1.3) and revised ratings (M = 3.3, SD = 1.4), $t(1178)$ = -0.72, p = .471, d = 0.02.

Distancing and Judgments Made. There was no difference in initial judgement depending on distance manipulation: $F(2, 1176) = 2.25$, p = .106 ${\eta_p}^2$ = 0.004, ($M_{\text{increased}}$ = 3.2, $SD_{\text{increased}}$ = 1.3, $M_{\text{decreased}}$ = 3.4, $SD_{\text{decreased}}$ = 1.3, M_{control} = 3.3, SD_{control} = 1.3). There was no difference in revised judgement depending on distance manipulation: $F(2, 1176) = 2.1$, p = .123, ${\eta_p}^2$ = 0.004, ($M_{\text{increased}}$ = 3.4, $SD_{\text{increased}}$ = 1.4, $M_{\text{decreased}}$ = 3.2, $SD_{\text{decreased}}$ = 1.4, M_{control} = 3.3, SD_{control} = 1.4).

Distancing and Reason-Giving/Dumbfounding. There was a significant association between temporal distance condition and response to the critical slide, $\chi^2(4, N = 1179) = 46.87$, $p < .001$, V = 0.2, the observed power was 1. The responses to the critical slide for the increased distance group (N = 400) the decreased distance group (N = 385), and the control group (N = 394) are displayed in Figure 4.

Table 11

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on temporal distancing

		Control	Increased	Decreased
Observed count	Reasons	279	282	231
	Dumbfounded	42	6	27
	Nothing Wrong	73	112	127
Expected count	Reasons	264.67	268.7	258.63
	Dumbfounded	25.06	25.45	24.49
	Nothing Wrong	104.26	105.85	101.88
Standardised residuals	Reasons	1.88	1.74	-3.65**
	Dumbfounded	4.28**	-4.9**	0.64
	Nothing Wrong	-4.38**	0.86	3.54**

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$

Social Distancing and Dumbfounding.

Overview of Judgments. A total of 848 participants (71.93%) rated the behavior of Julie and Mark as wrong initially, and 793 participants (67.26%) rated the behavior as wrong at the end of the task. There was a significant difference between initial ratings ($M = 3.3$, $SD = 1.3$) and revised ratings ($M = 3.3$, $SD = 1.4$), $t(1178) =$ -0.72, $p = .471$, $d = 0.02$.

Distancing and Judgments Made. There was no difference in initial judgement depending on distance manipulation: $t(1175.62) = 1.08$, $p = .278$, $d = 0.06$, ($M_{\text{increased}} = 3.3$, $SD_{\text{increased}} = 1.3$, $M_{\text{decreased}} = 3.3$, $SD_{\text{decreased}} = 1.3$). There was no difference in revised judgement depending on distance manipulation: $t(1168.74) = 0.24$, $p = .812$, $d = 0.01$, ($M_{\text{increased}} = 3.4$, $SD_{\text{increased}} = 1.4$, $M_{\text{decreased}} = 3.3$, $SD_{\text{decreased}} =$ 1.4).

Distancing and Reason-Giving/Dumbfounding. There was a significant association between temporal distance condition and response to the critical slide, $\chi^2(2, N = 1179) = 13.537$, $p = .001$, $V = 0.11$, the observed power was 0.88. The responses to the critical slide for the increased distance group ($N = 574$) and the decreased distance group ($N = 605$) are displayed in Figure 5.

Table 12

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on social distancing

		Increased	Decreased
Observed count	Reasons	478	434
	Dumbfounded	45	64
	Nothing Wrong	114	114
Expected count	Reasons	465.13	446.87
	Dumbfounded	55.59	53.41
	Nothing Wrong	116.28	111.72
Standardised residuals	Reasons	1.64	-1.64
	Dumbfounded	-2.12*	2.12*
	Nothing Wrong	-0.33	0.33

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$

Combined Effects of both Distance Manipulations

A multinomial logistic regression was conducted to examine the combined effects of both temporal and social distance on responses to the critical slide. Overall the model significantly predicted responses to the critical slide $\chi^2(10, N = 1179) = 72.19$, $p < .001$, The observed power was 1. The model explained between 2.02% (Cox and Snell R square) and 4.91% (Nadelkerke R squared) of the variance in responses to the critical slide. For scenarios in the future, participants were more likely to provide reasons than to present as dumbfounded Wald = -5.81, $p = .004$, odds ratio = 0.05, 95% CI [0.01, 0.38].

Table 13

Predictors of each response with reason-giving as the reference response

Response	Term	*b*	*S.E.*	*z*	Wald	*p*	*O.R.*	Lower	Upper
D	(Intercept)	-2.07	0.25	-8.29	-16.57	< .001**	0.13	0.08	0.21
D	Soc-Self	0.34	0.33	1.01	2.02	0.312	1.40	0.73	2.70
D	Temp-Future	-3.00	1.03	-2.90	-5.81	.004*	0.05	0.01	0.38
D	Temp-Now	-0.34	0.41	-0.83	-1.66	0.407	0.71	0.32	1.60
D	Soc-Self × Temp-Future	1.54	1.15	1.34	2.68	0.18	4.68	0.49	44.70
D	Soc-Self × Temp-Now	0.13	0.54	0.25	0.49	0.805	1.14	0.40	3.27
NW	(Intercept)	-1.35	0.18	-7.33	-14.66	< .001**	0.26	0.18	0.37
NW	Soc-Self	0.02	0.26	0.09	0.17	0.931	1.02	0.61	1.71
NW	Temp-Future	-0.01	0.25	-0.04	-0.08	0.969	0.99	0.60	1.63
NW	Temp-Now	0.58	0.25	2.34	4.69	.019*	1.79	1.10	2.93
NW	Soc-Self × Temp-Future	0.80	0.35	2.28	4.57	.022*	2.22	1.12	4.40
NW	Soc-Self × Temp-Now	0.28	0.35	0.82	1.64	0.412	1.33	0.67	2.61

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$; D = dumbfounded, NW = nothing-wrong

Heinz

Temporal Distancing and Dumbfounding.

Overview of Judgments. A total of 812 participants (69.28%) rated the behavior of Julie and Mark as wrong initially, and 807 participants (68.86%) rated the behavior as wrong at the end of the task. There was a significant difference between initial ratings (M = 3.3, SD = 1.3) and revised ratings (M = 3.4, SD = 1.4), $t(1171)$ = -1, p = .319, d = 0.03.

Distancing and Judgments Made. There was no difference in initial judgement depending on distance manipulation: $F(2, 1169) = 1.04$, p = .355 ${\eta_p}^2$ = 0.002, ($M_{\text{increased}}$ = 3.4, $SD_{\text{increased}}$ = 1.3, $M_{\text{decreased}}$ = 3.2, $SD_{\text{decreased}}$ = 1.4, M_{control} = 3.3, SD_{control} = 1.3). There was no difference in revised judgement depending on distance manipulation: $F(2, 1169) = 3.18$, p = .042, ${\eta_p}^2 = 0.005$, ($M_{\text{increased}}$ = 3.5, $SD_{\text{increased}}$ = 1.4, $M_{\text{decreased}}$ = 3.4, $SD_{\text{decreased}}$ = 1.4, M_{control} = 3.2, SD_{control} = 1.4).

Distancing and Reason-Giving/Dumbfounding. There was a significant association between temporal distance condition and response to the critical slide, $\chi^2(4, N = 1172) = 43.011$, $p < .001$, $V = 0.19$, the observed power was 1. The responses to the critical slide for the increased distance group (N = 393) the decreased distance group (N = 386), and the control group (N = 393) are displayed in Figure 4.

Table 14

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on temporal distancing

		Control	Increased	Decreased
Observed count	Reasons	279	282	231
	Dumbfounded	42	6	27
	Nothing Wrong	73	112	127
Expected count	Reasons	264.67	268.7	258.63
	Dumbfounded	25.06	25.45	24.49
	Nothing Wrong	104.26	105.85	101.88
Standardised residuals	Reasons	1.88	1.74	-3.65**
	Dumbfounded	4.28**	-4.9**	0.64
	Nothing Wrong	-4.38**	0.86	3.54**

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$

Social Distancing and Dumbfounding.

Overview of Judgments. A total of 812 participants (69.28%) rated the behavior of Julie and Mark as wrong initially, and 807 participants (68.86%) rated the behavior as wrong at the end of the task. There was a significant difference between initial ratings ($M = 3.3$, $SD = 1.3$) and revised ratings ($M = 3.4$, $SD = 1.4$), $t(1171) =$ -1, $p = .319$, $d = 0.03$.

Distancing and Judgments Made. There was no difference in initial judgement depending on distance manipulation: $t(1169.95) = 1.28$, $p = .201$, $d = 0.07$, ($M_{\text{increased}} = 3.4$, $SD_{\text{increased}} = 1.3$, $M_{\text{decreased}} = 3.3$, $SD_{\text{decreased}} = 1.4$). There was no difference in revised judgement depending on distance manipulation: $t(1169.93) =$ -0.52, $p = .602$, $d = 0.03$, ($M_{\text{increased}} = 3.4$, $SD_{\text{increased}} = 1.4$, $M_{\text{decreased}} = 3.4$, $SD_{\text{decreased}} = 1.4$).

Distancing and Reason-Giving/Dumbfounding. There was a significant association between temporal distance condition and response to the critical slide, $\chi^2(2, N = 1172) = 6.245$, $p = .044$, $V = 0.07$, the observed power was 0.54. The responses to the critical slide for the increased distance group ($N = 573$) and the decreased distance group ($N = 599$) are displayed in Figure 5.

Table 15

Observed counts, expected counts, and standardised residuals for each response to the critical slide depending on social distancing

		Increased	Decreased
Observed count	Reasons	478	434
	Dumbfounded	45	64
	Nothing Wrong	114	114
Expected count	Reasons	465.13	446.87
	Dumbfounded	55.59	53.41
	Nothing Wrong	116.28	111.72
Standardised residuals	Reasons	1.64	-1.64
	Dumbfounded	-2.12*	2.12*
	Nothing Wrong	-0.33	0.33

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$

Combined Effects of both Distance Manipulations

A multinomial logistic regression was conducted to examine the combined effects of both temporal and social distance on responses to the critical slide. Overall the model significantly predicted responses to the critical slide $\chi^2(10, N = 1172) = 50.8$, $p < .001$, The observed power was 1. The model explained between 1.43% (Cox and Snell R square) and 3.3% (Nadelkerke R squared) of the variance in responses to the critical slide. For scenarios in the future, participants were more likely to provide reasons than to present as dumbfounded Wald = -5.21, $p = .009$, odds ratio = 0.31, 95% CI [0.13, 0.75].

Table 16

Predictors of each response with reason-giving as the reference response

Response	Term	*b*	*S.E.*	*z*	Wald	*p*	*O.R.*	Lower	Upper
D	(Intercept)	-1.77	0.23	-7.67	-15.34	< .001**	0.17	0.11	0.27
D	Soc-Self	0.57	0.29	1.94	3.88	0.053	1.76	0.99	3.13
D	Temp-Future	-1.18	0.45	-2.61	-5.21	.009*	0.31	0.13	0.75
D	Temp-Now	-0.30	0.36	-0.84	-1.69	0.399	0.74	0.37	1.49
D	Soc-Self × Temp-Future	-0.08	0.57	-0.14	-0.28	0.889	0.92	0.30	2.83
D	Soc-Self × Temp-Now	-0.20	0.47	-0.43	-0.86	0.668	0.82	0.33	2.05
NW	(Intercept)	-1.25	0.19	-6.70	-13.39	< .001**	0.29	0.20	0.41
NW	Soc-Self	-0.18	0.27	-0.65	-1.30	0.517	0.84	0.49	1.43
NW	Temp-Future	0.25	0.25	1.00	2.00	0.317	1.28	0.79	2.10
NW	Temp-Now	0.60	0.24	2.45	4.90	.014*	1.82	1.13	2.93
NW	Soc-Self × Temp-Future	0.18	0.36	0.51	1.03	0.607	1.20	0.60	2.42
NW	Soc-Self × Temp-Now	0.22	0.35	0.63	1.26	0.529	1.25	0.63	2.49

Note. * = sig. at $p < .05$; ** = sig. at $p < .001$; D = dumbfounded, NW = nothing-wrong

Plots: All Scenarios

Figure 4

Temporal distance and reason-giving for each Scenario

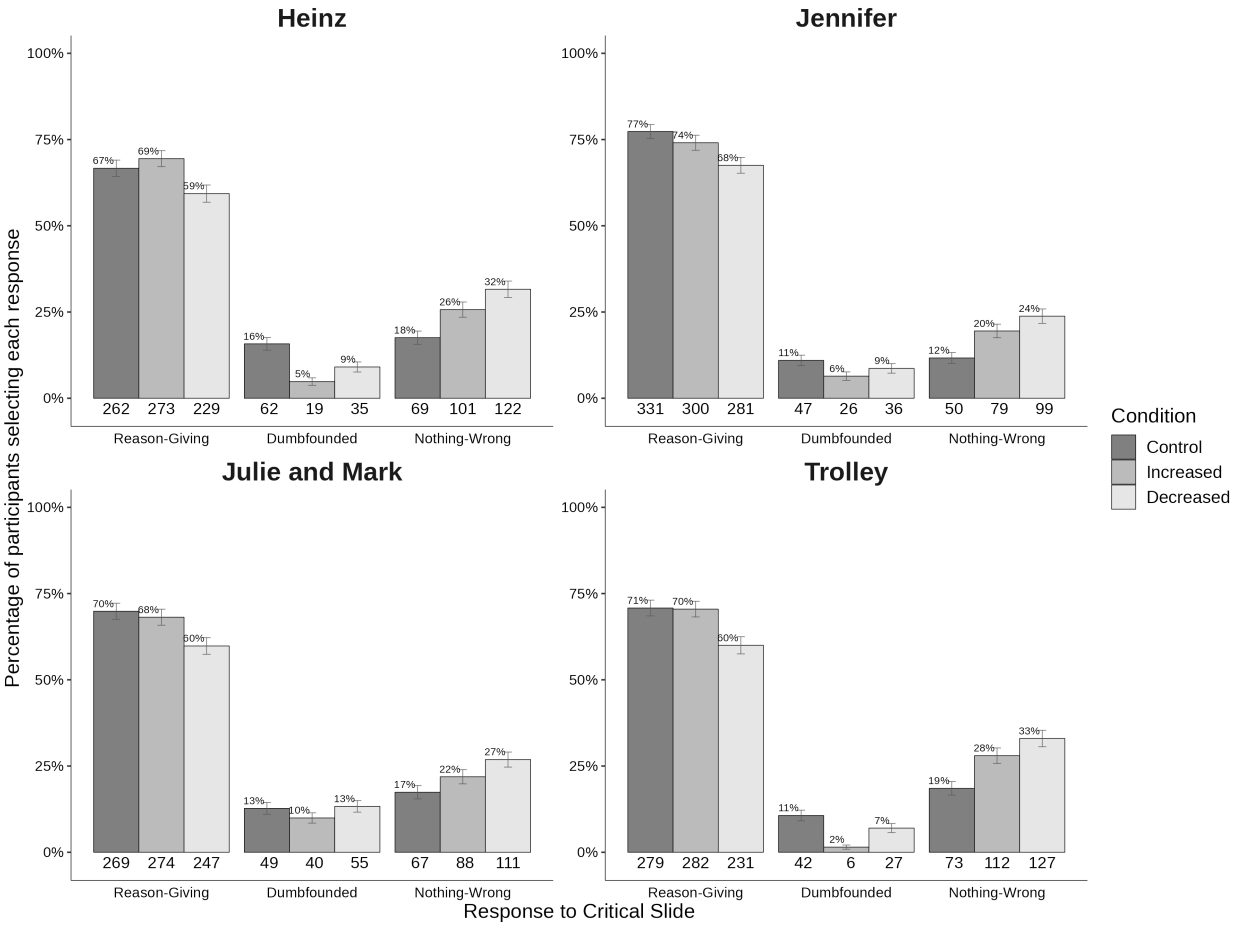


Figure 5

Social distance and reason-giving for each Scenario

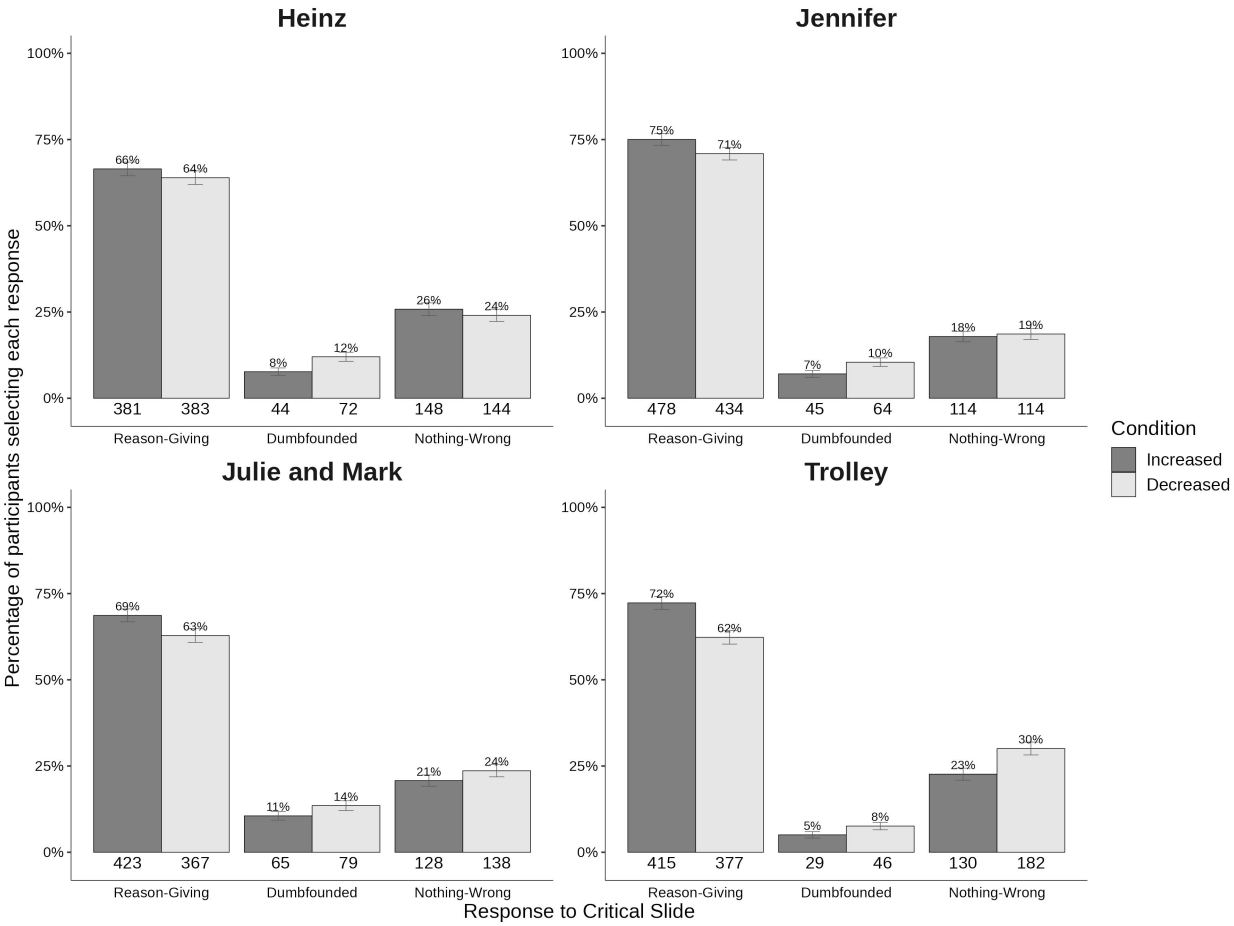


Figure 6

Both distance manipulations and reason-giving for each Scenario