8 Appendix

8.1 Deviations from the pre-analysis plan (PAP)

The analysis in the paper differs from the PAP in the following ways (all mentioned in the main body of the paper):

- Unlike in the PAP, we standardize outcome variables. This allows for simpler presentation.
- In seeking to adjust our hypothesis tests of treatment effect heterogeneity in the paper, we focus on the null hypothesis that **all interactions** between the moderator (pre-treatment pessimism) and the treatment (number of good news items) are zero. In the PAP, the null hypothesis only relates to interactions involving the indicator for "highest tercile of pre-treatment pessimism". Given that interactions involving the middle category are also of interest (and our theoretical expectations allow for non-monotonic relationships between pre-treatment pessimism and the effect of good news on beliefs), this seemed more appropriate.
- In our PAP, we said that analysis of individual information treatments would include two treatments that are not well described as "good news" – one information treatment about the US gas tax relative to OECD counterparts, and one question order treatment (whether the IRA is described before or after other outcome questions). The null results produced by this analysis are fully reported in the appendix, though these treatments are not included in the reported adjustments for multiple comparisons). We thought it was better to not include these treatments in the main body of the paper to keep the description of the design simple.

8.2 Attention check and analysis omitting respondents who fail

The attention check appeared in the middle of the section in which we measured outcomes. (If an attention check is used to exclude inattentive respondents, it is better for it to appear before treatments are applied. This placement is better for assessing how attentive

respondents are when outcomes are measured.) The question states, "Some people argue that the risks from climate change have been widely exaggerated. Also, some researchers believe that the responses that come from surveys like this one are not reliable. To show skeptics that respondents to this survey do pay attention, could you please answer both 'Strongly disagree' and 'Neither agree nor disagree' below?" Response options provided were "Strongly disagree", "Somewhat disagree", "Neither agree nor disagree", "Somewhat agree", "Strongly agree".

Figure 3 reproduces Figure 1 without the respondents who failed the attention check. Table 4 presents the underlying analysis in table form, to complement Table 6.

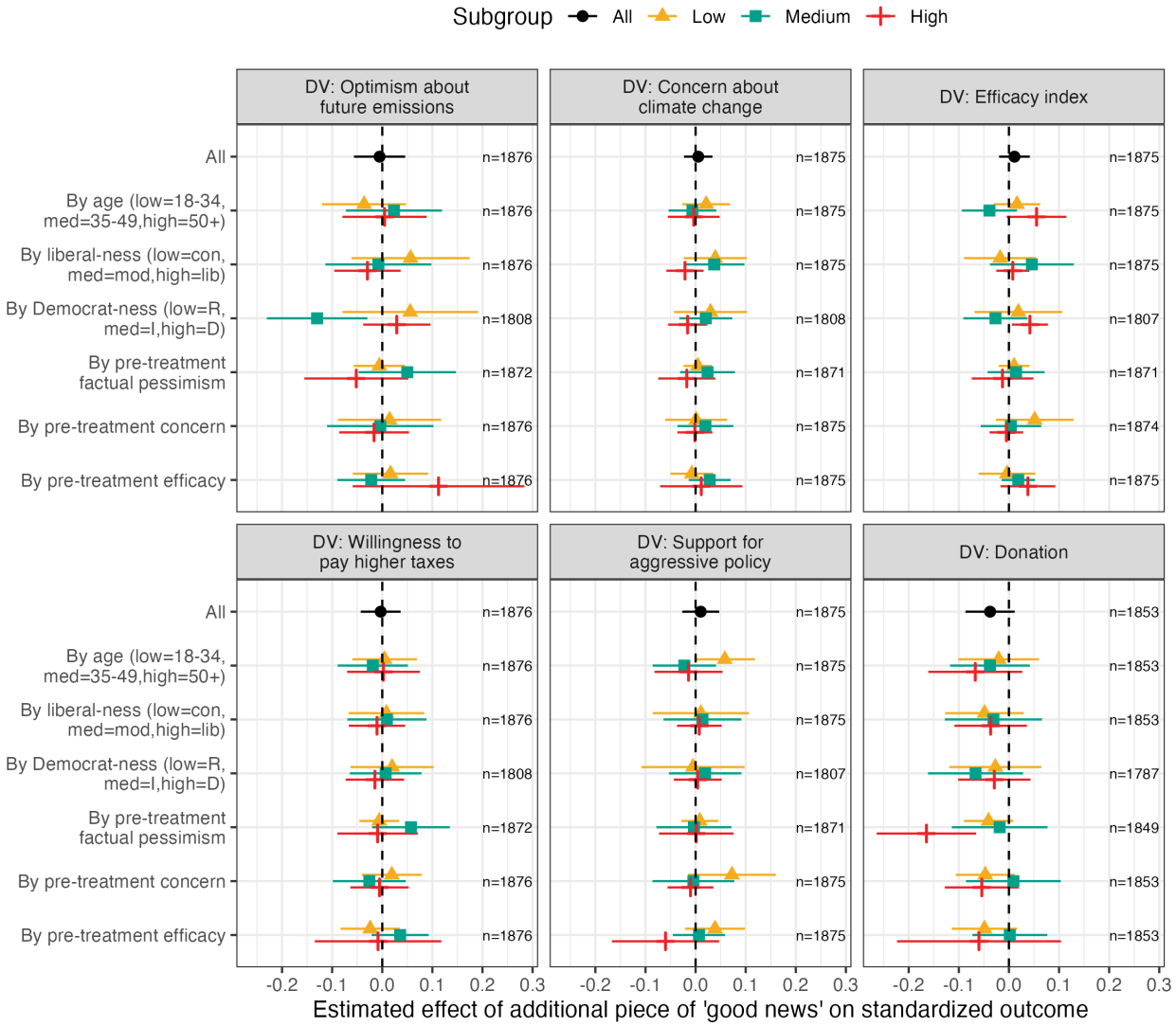

Figure 3: Effect of 'good news' on six outcomes, on average and across subgroups (excluding respondents who fail the attention check)

Table 4: Average effect of additional pieces of good news (excluding respondents who failed the attention check)

	A: Attitudes/beliefs			B: Policy preferences		
	Optimism about future emissions	Concern	Efficacy	Willingness to pay higher taxes	Support for more aggressive policy	Donation
Intercept	2.967***	2.638***	3.144***	1.391***	1.829***	0.885***
	(0.102)	(0.056)	(0.054)	(0.075)	(0.075)	(0.086)
Good news items provided	−0.005	0.005	0.011	−0.003	0.010	−0.038
	(0.026)	(0.014)	(0.016)	(0.020)	(0.019)	(0.025)
Pre-treatment climate concern	0.244***	0.861***		0.563***	0.545***	0.357***
	(0.032)	(0.017)		(0.023)	(0.024)	(0.025)
Pre-treatment self-efficacy			0.973***			
			(0.019)			
Pre-treatment liberal-ness	−0.072**	0.142***	0.170***	0.216***	0.310***	0.008
	(0.026)	(0.014)	(0.013)	(0.020)	(0.019)	(0.023)
Household income category				0.075***		0.047*
				(0.016)		(0.021)
Household income missing				−0.349*		−0.201
				(0.152)		(0.199)
Num.Obs.	1876	1875	1875	1876	1875	1853
R2	0.035	0.731	0.673	0.439	0.528	0.110

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

8.3 Full set of knowledge quiz questions

Table 5: All questions on our knowledge survey

Question	Correct answer	Other answer options
What does CO2 stand for?	Carbon dioxide	Carbon monoxide; Greenhouse effect; Climate change
Which of the following phenomena is the main cause of global warming over the last 20 years?	Increased emissions of greenhouse gasses (the so-called greenhouse effect)	Reduction of the ozone layer (the so-called ozone hole); Changes in ocean currents, e.g., 'el Niño'; Changes in the tilt of earth's axis
Which phenomenon is not caused by global warming?	Earthquakes	Glacial melting; Sea level rise; Changes in ocean currents
Which of the following do scientists believe would help limit global warming?	All of the above	Making buildings more energy efficient, Increasing the use of electric vehicles, Generating more electricity from solar energy, Reducing the consumption of meat
Which of the following is a form of renewable energy?	Wind	Clean coal; Petroleum; Natural gas
Which of the following is part of environmental legislation passed by the Biden administration?	Tax credits for people who purchase electric vehicles made in the US	New taxes on the consumption of gasoline and other fossil fuels; A nationwide cap-and-trade system to limit carbon emissions; Federal funding for the construction of large hydropower dams
Taxes on gasoline are found in all OECD countries. (The OECD is an organization of relatively wealthy countries such as the US, Canada, France, Germany, Australia and Japan.) These taxes are considered an important way to convince people to drive less and use more efficient vehicles. How many of the 37 other OECD countries do you think have lower gasoline taxes than the US?	0	14; 26, 27
About 120,000 Americans currently work in the coal industry. How many Americans work in the solar and wind power industries?	Around 480,000, or four times as many	Around 30,000, or one-fourth as many; Around 60,000, or half as many; Around 120,000, or the same number; Around 240,000, or twice as many
In 2007, the US emitted about 6 billion tons of carbon dioxide from fossil fuels. How has that number changed since then?	It went down by about 15%, to 5 billion tons	It went down by about 30%, to 4 billion tons; It stayed about the same (6 billion tons); It went up by about 15%, to 7 billion tons; It went up by about 30%, to 8 billion tons
In the US and elsewhere, large solar power plants are built to convert sunlight into electricity for the grid. How has the cost of building such projects changed over the last 10 years?	The cost has gone down by around 80%	The cost has gone down by about 40%; The cost has stayed about the same; The cost has gone up by about 40%; The cost has gone up by about 80%

8.4 Power analysis

Figure 4 and Figure 5 show power curves for individual outcomes and collections of outcomes (respectively) for the analysis of average effects in Figure 1. To produce the figure, we repeat the following procedure 500 times for each value of $\beta \in \{0, .02, .04, .06, .08, .1\}$:

- reshuffle the assignment of number of pieces of good news, $D_i \in \{0, 1, 2, 3\}$
- replace each observed outcome Y_i^{obs} with $Y_i = Y_i^{\text{obs}} + \beta D_i$
- run the pre-specified analysis measuring the effect of D_i on Y_i

In Figure 4 we report, for each of the outcome variables, the proportion of the 500 iterations in which we reject the null that the slope coefficient on D_i is zero (using a p-value threshold of .05). Power varies across outcome variables, but if the effect of a single piece of good news on each outcome (β) is .075 standard deviations of the outcome (i.e. providing all three pieces vs. 0 would change the outcome by .225 standard deviations), then power for all six outcomes would be above .8.

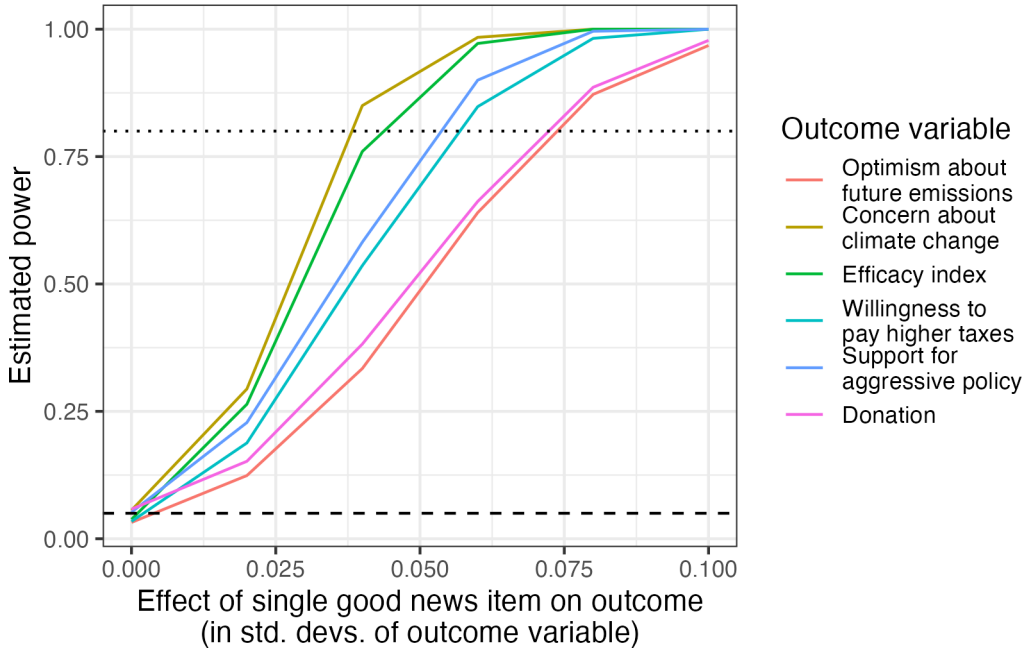

Figure 4: Power curve for coefficient on good news items, by outcome variable

In Figure 5 we report, for each family of outcome variables, the proportion of the 500 iterations in which we reject the null that all of the slope coefficients in the family are zero (using the p-value threshold we determined would achieve a FWER no greater than .05,

which is 0.0175 for hypothesis family A and 0.0144 for hypothesis family B). If the effect of a single piece of good news on each outcome (β) were .05 standard deviations of the outcome (i.e. providing all three pieces vs. 0 would change the outcome by .15 standard deviations), then power for both families would be .8. Note that power when $\beta = 0$ is around .05, as intended.

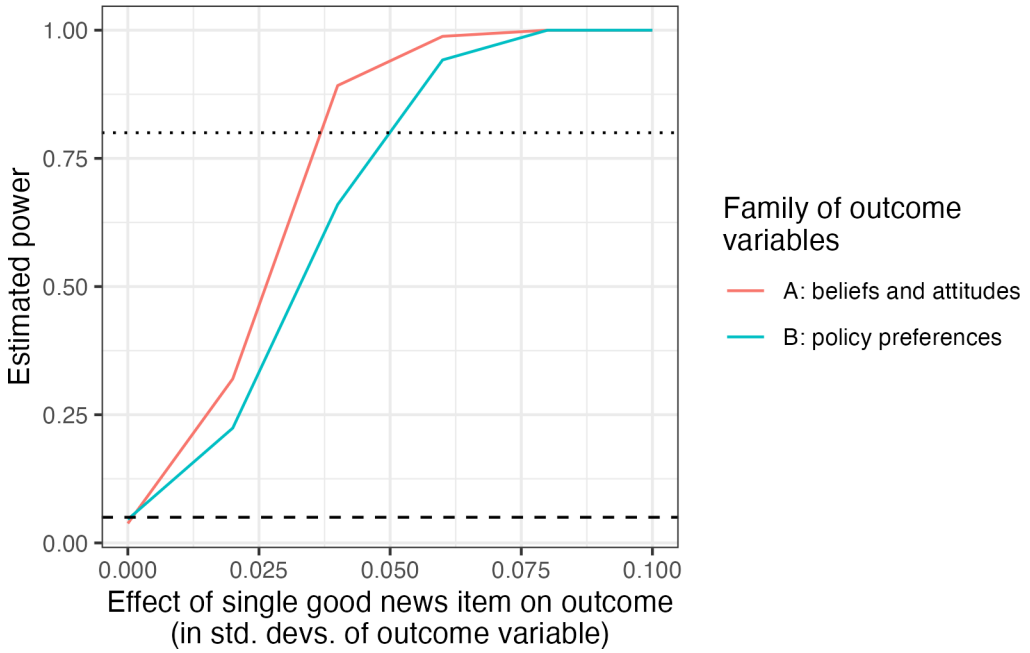

Figure 5: Power curve for coefficient on good news items, by family of outcome variables

Figure 6 and Figure 7 show power curves for individual outcomes and collections of outcomes (respectively) for the analysis of heterogeneity in the effect of additional pieces of "good news" by pre-treatment factual pessimism (reported in Figure 1). To produce the figure, we repeat the following procedure 500 times for each value of $x \in \{0, .02, .04, .06, .08, .1\}$:

- reshuffle the assignment of number of pieces of good news, $D_i \in \{0, 1, 2, 3\}$
- replace each observed outcome Y_i^{obs} with $Y_i = Y_i^{\text{obs}} + \beta_i D_i$, where β_i is $-x/2$ for respondents in the lowest pessimism tercile, 0 for respondents in the middle pessimism tercile, and $x/2$ for respondents in the highest pessimism tercile (so that x is the difference in the effect of D_i between respondents in the highest and lowest tercile)
- run the pre-specified analysis measuring the effect of D_i interacted with pessimism tercile on Y_i

In Figure 6 we report, for each of the outcome variables, the proportion of the 500 iterations in which we reject the null that the slope coefficient on D_i is zero (using a p-value threshold of .05). Across all outcomes, if the effect of a single piece of good news varies by .1 standard deviation between high- and low-pessimism respondents, we obtain a power of around .5.

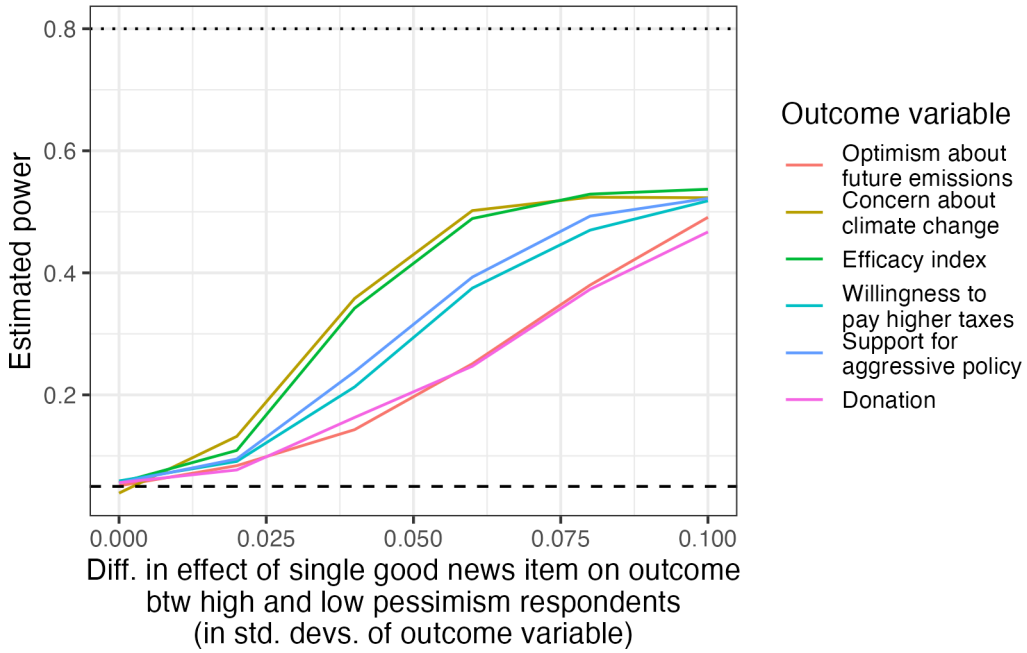

Figure 6: Power curve for interactions with pessimism tercile, by outcome variable

In Figure 7 we report, for each family of outcome variables, the proportion of the 500 iterations in which we reject the null that all of the interaction coefficients in the family are zero (using the p-value threshold we determined would achieve a FWER no greater than .05, which is 0.0071 for hypothesis family A and 0.0071 for hypothesis family B). Here the horizontal axis denotes x, the difference in the effect between high- and low-pessimism terciles. Note again that power when $x = 0$ is around .05, as intended.

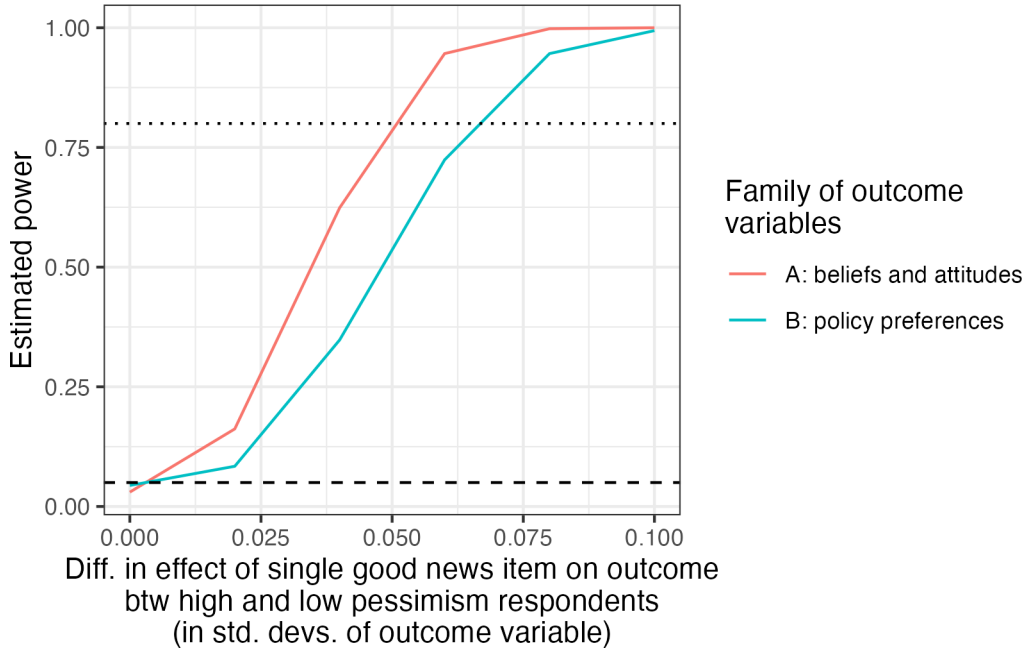

Figure 7: Power curve for interactions with pessimism tercile, by family of outcome variables

8.5 Regression tables supporting figures in paper

- Table 6 supports estimates of average effects in Figure 1
- Table 7 supports estimates of heterogeneity by age group in Figure 1
- Table 8 supports estimates of heterogeneity by political ideology group in Figure 1
- Table 9 supports estimates of heterogeneity by party ID group in Figure 1
- Table 10 supports estimates of heterogeneity by pre-treatment factual pessimism group in Figure 1
- Table 11 supports estimates of heterogeneity by pre-treatment concern group in Figure 1
- Table 12 supports estimates of heterogeneity by pre-treatment efficacy group in Figure 1

Table 6: Average effect of additional pieces of good news

	A: Attitudes/beliefs			B: Policy preferences		
	Optimism about future emissions	Concern	Efficacy	Willingness to pay higher taxes	Support for more aggressive policy	Donation
Intercept	2.947***	2.642***	3.123***	1.386***	1.855***	0.843***
	(0.099)	(0.054)	(0.053)	(0.073)	(0.073)	(0.085)
Good news items provided	0.002	0.005	0.015	0.001	0.001	−0.021
	(0.025)	(0.014)	(0.015)	(0.020)	(0.018)	(0.024)
Pre-treatment climate concern	0.234***	0.861***		0.563***	0.539***	0.353***
	(0.031)	(0.016)		(0.022)	(0.024)	(0.025)
Pre-treatment self-efficacy			0.971***			
			(0.018)			
Pre-treatment liberal-ness	−0.067**	0.143***	0.173***	0.216***	0.308***	0.017
	(0.025)	(0.014)	(0.012)	(0.019)	(0.019)	(0.023)
Household income category				0.074***		0.050*
				(0.015)		(0.020)
Household income missing				−0.392**		−0.249
				(0.148)		(0.189)
Num.Obs.	1980	1979	1978	1980	1979	1956
R2	0.032	0.728	0.668	0.437	0.519	0.107

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 7: Interactions between good news provision and age group

	A: Attitudes/beliefs			B: Policy preferences		
	Optimism about future emissions	Concern	Efficacy	Willingness to pay higher taxes	Support for aggressive US policy	Donation
Intercept	3.136***	2.670***	3.130***	1.462***	1.830***	0.788***
	(0.120)	(0.068)	(0.063)	(0.089)	(0.083)	(0.105)
Good news items provided	−0.033	0.024	0.021	0.007	0.048	−0.018
	(0.042)	(0.024)	(0.023)	(0.032)	(0.030)	(0.040)
Age 35-49	−0.222*	−0.014	0.056	−0.063	0.086	−0.067
	(0.108)	(0.058)	(0.060)	(0.079)	(0.071)	(0.096)
Age 50+	−0.251*	−0.031	−0.070	−0.119	0.040	0.164
	(0.105)	(0.060)	(0.067)	(0.082)	(0.075)	(0.109)
Good news X Age 35-49	0.075	−0.036	−0.051	−0.028	−0.069	0.004
	(0.063)	(0.033)	(0.036)	(0.047)	(0.043)	(0.056)
Good news X Age 50+	0.037	−0.026	0.035	0.008	−0.077+	−0.021
	(0.059)	(0.035)	(0.038)	(0.048)	(0.045)	(0.062)
Covariates included	Y	Y	Y	Y	Y	Y
Num.Obs.	1980	1979	1978	1980	1979	1956
R2	0.039	0.729	0.669	0.440	0.521	0.113

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 8: Interactions between good news provision and ideology

	A: Attitudes/beliefs			B: Policy preferences		
	Optimism about future emissions	Concern	Efficacy	Willingness to pay higher taxes	Support for aggressive US policy	Donation
Intercept	3.136***	2.667***	3.369***	1.446***	1.985***	0.989***
	(0.150)	(0.074)	(0.080)	(0.102)	(0.106)	(0.121)
Good news items provided	0.062	0.046	−0.014	0.013	0.020	−0.025
	(0.058)	(0.031)	(0.036)	(0.037)	(0.047)	(0.039)
Moderate	0.492**	0.115	0.092	−0.097	0.284**	0.160
	(0.151)	(0.081)	(0.099)	(0.104)	(0.109)	(0.128)
Liberal	0.792***	0.290**	0.364***	0.065	0.447***	0.309+
	(0.185)	(0.097)	(0.099)	(0.138)	(0.129)	(0.170)
Good news X Moderate	−0.063	−0.011	0.059	0.003	−0.017	0.006
	(0.078)	(0.043)	(0.055)	(0.054)	(0.060)	(0.061)
Good news X Liberal	−0.083	−0.069+	0.028	−0.023	−0.027	0.005
	(0.067)	(0.036)	(0.040)	(0.047)	(0.052)	(0.053)
Covariates included	Y	Y	Y	Y	Y	Y
Num.Obs.	1980	1979	1978	1980	1979	1956
R2	0.042	0.730	0.671	0.439	0.523	0.109

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 9: Interactions between good news provision and party ID

	A: Attitudes/beliefs			B: Policy preferences		
	Optimism about future emissions	Concern	Efficacy	Willingness to pay higher taxes	Support for aggressive US policy	Donation
Intercept	2.868***	2.617***	3.184***	1.386***	1.834***	0.839***
	(0.137)	(0.073)	(0.080)	(0.088)	(0.097)	(0.099)
Good news items provided	0.071	0.044	0.014	0.034	0.012	−0.003
	(0.067)	(0.036)	(0.044)	(0.041)	(0.051)	(0.046)
Independent	0.433**	0.082	0.040	0.040	0.175+	0.123
	(0.147)	(0.076)	(0.097)	(0.091)	(0.104)	(0.113)
Democrat	0.271+	0.243**	0.075	0.121	0.235*	0.153
	(0.147)	(0.077)	(0.094)	(0.097)	(0.102)	(0.110)
Good news X Independent	−0.206*	−0.027	−0.031	−0.034	−0.009	−0.058
	(0.083)	(0.044)	(0.054)	(0.054)	(0.062)	(0.065)
Good news X Democrat	−0.029	−0.063	0.031	−0.041	−0.020	−0.004
	(0.075)	(0.040)	(0.048)	(0.050)	(0.056)	(0.058)
Covariates included	Y	Y	Y	Y	Y	Y
Num.Obs.	1910	1910	1908	1910	1909	1888
R2	0.042	0.731	0.674	0.431	0.517	0.109

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 10: Interactions between good news provision and pre-treatment pessimism

	A: Attitudes/beliefs			B: Policy preferences		
	Optimism about future emissions	Concern	Efficacy	Willingness to pay higher taxes	Support for aggressive US policy	Donation
Intercept	2.953***	2.643***	3.123***	1.394***	1.858***	0.856***
	(0.099)	(0.054)	(0.053)	(0.074)	(0.073)	(0.085)
Good news items provided	0.001	0.004	0.015	−0.001	−0.001	−0.024
	(0.025)	(0.014)	(0.015)	(0.020)	(0.018)	(0.025)
Medium pessimism	−0.159*	−0.051	−0.004	−0.169**	−0.054	−0.112
	(0.078)	(0.042)	(0.045)	(0.059)	(0.054)	(0.077)
High pessimism	−0.023	0.060	0.010	−0.013	0.018	0.166*
	(0.075)	(0.042)	(0.046)	(0.055)	(0.051)	(0.070)
Good news X medium pessimism	0.056	0.018	0.003	0.056	−0.008	0.019
	(0.045)	(0.024)	(0.026)	(0.035)	(0.032)	(0.043)
Good news X high pessimism	−0.038	−0.022	−0.009	0.011	−0.006	−0.109**
	(0.043)	(0.024)	(0.027)	(0.033)	(0.031)	(0.042)
Covariates included	Y	Y	Y	Y	Y	Y
Num.Obs.	1976	1975	1974	1976	1975	1952
R2	0.037	0.729	0.667	0.440	0.521	0.114

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 11: Interactions between good news provision and pre-treatment concern

	A: Attitudes/beliefs			B: Policy preferences		
	Optimism about future emissions	Concern	Efficacy	Willingness to pay higher taxes	Support for aggressive US policy	Donation
Intercept	2.573***	2.383***	2.947***	1.222***	1.523***	0.698***
	(0.134)	(0.071)	(0.071)	(0.090)	(0.099)	(0.113)
Good news items provided	0.002	0.000	0.047	0.020	0.062	−0.052+
	(0.051)	(0.031)	(0.039)	(0.030)	(0.044)	(0.029)
Moderately concerned	0.447**	0.111	0.516***	0.065	0.393***	0.033
	(0.147)	(0.077)	(0.087)	(0.095)	(0.106)	(0.119)
Very or extremely concerned	0.544***	0.641***	0.657***	0.432***	0.505***	0.370**
	(0.142)	(0.075)	(0.077)	(0.098)	(0.102)	(0.126)
Good news X Moderately concerned	0.032	0.021	−0.033	−0.037	−0.074	0.078
	(0.073)	(0.041)	(0.049)	(0.046)	(0.059)	(0.054)
Good news X Very or extremely concerned	−0.016	−0.003	−0.048	−0.022	−0.081+	0.021
	(0.062)	(0.035)	(0.042)	(0.041)	(0.049)	(0.047)
Covariates included	Y	Y	Y	Y	Y	Y
Num.Obs.	1980	1979	1977	1980	1979	1956
R2	0.045	0.760	0.704	0.456	0.526	0.118

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 12: Interactions between good news provision and pre-treatment efficacy

	A: Attitudes/beliefs			B: Policy preferences		
	Optimism about future emissions	Concern	Efficacy	Willingness to pay higher taxes	Support for aggressive US policy	Donation
Intercept	2.493***	2.525***	2.810***	1.217***	1.816***	0.613***
	(0.112)	(0.060)	(0.067)	(0.081)	(0.083)	(0.093)
Good news items provided	0.019	−0.003	0.006	−0.008	0.024	−0.035
	(0.037)	(0.021)	(0.028)	(0.029)	(0.030)	(0.033)
Medium efficacy	0.602***	0.112*	0.611***	0.149*	0.045	0.242**
	(0.091)	(0.052)	(0.061)	(0.071)	(0.068)	(0.089)
High efficacy	0.774***	0.297***	0.453***	0.485***	0.162+	0.576***
	(0.155)	(0.076)	(0.085)	(0.111)	(0.095)	(0.150)
Good news X Medium efficacy	−0.030	0.024	0.010	0.039	−0.022	0.051
	(0.050)	(0.029)	(0.033)	(0.040)	(0.039)	(0.049)
Good news X High efficacy	0.082	0.014	0.035	−0.017	−0.096	−0.001
	(0.094)	(0.046)	(0.039)	(0.070)	(0.061)	(0.089)
Covariates included	Y	Y	Y	Y	Y	Y
Num.Obs.	1980	1979	1978	1980	1979	1956
R2	0.120	0.738	0.723	0.457	0.520	0.141

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

8.6 Results for all information treatments

Figure 8 is a version of Figure 2 presenting results for all information treatments discussed in our PAP including the gas tax treatment (informing respondents that the US's gas tax is the lowest in the OECD) and the IRA treatment (informing respondents about the Inflation Reduction Act before asking about emissions optimism, climate concern, efficacy, and willingness to pay taxes vs after). Our PAP did not include these in the "good news" items that were analyzed in Figure 1, but it said we would analyze their effects along with other information treatments. We omitted this from the main body of the paper for presentational reasons: describing these treatments and discussing their effects requires space and makes the paper less focused on the effect of good news about climate mitigation.

Telling respondents about the IRA is estimated to reduce respondents' sense of efficacy by 0.056 standard deviations; the associated p-value (0.031) is above the threshold we calculated *without* these extra information treatments (0.007), so we do not reject the null hypothesis. None of the interactions between pre-treatment pessimism and either the gas

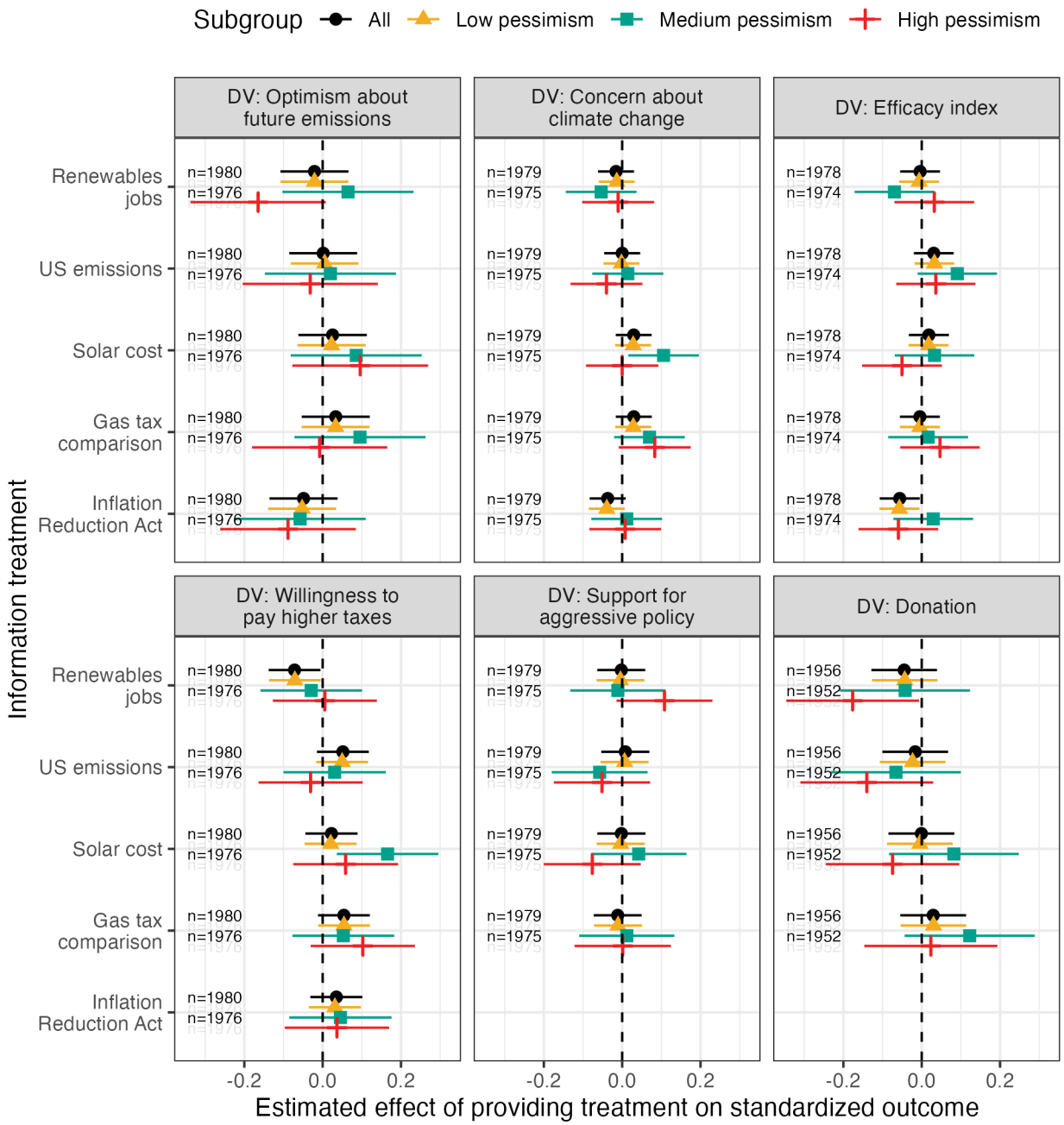

Figure 8: Effect of each information treatment, on average and by respondent pre-treatment factual pessimism

tax information treatment or the IRA treatment is significant at .05 even before adjustment for multiple testing.

8.7 Results using number of 'good news corrections'

Following our PAP, the analysis in the main paper focuses on the marginal effect of providing a correct answer to the quiz questions on our survey dealing with the cost of solar power, the size of the renewable jobs sector in the US, and the trajectory of US emissions. In Figure 9 we show the same analysis as Figure 1, but here the treatment is not the number of correct answers provided but the number of "good news corrections". A respondent receives a "good news correction" when (i) she is provided with a correct answer to one of the three quiz questions, and (ii) her own answer to that question was less optimistic than the correct answer. (Thus this measure of the treatment recognizes that if someone already knew the right answer to a question, then providing the correct answer to that question does not constitute "good news" for that person and should have no effect.) The analysis underlying Figure 9 is the same as the analysis underlying Figure 1 with one exception: because assignment to treatment in this case is random only conditional on the number of "good news corrections" that the respondent could have received, we add a fixed effect for this number. (The number of possible good news corrections is 0 in 0.7% of cases, 1 in 3.3%, 2 in 30.4%, and 3 in 2 in 65.6%.)

The results are highly similar to those in Figure 1, with no significant average effects and significant effects in the same subgroups.

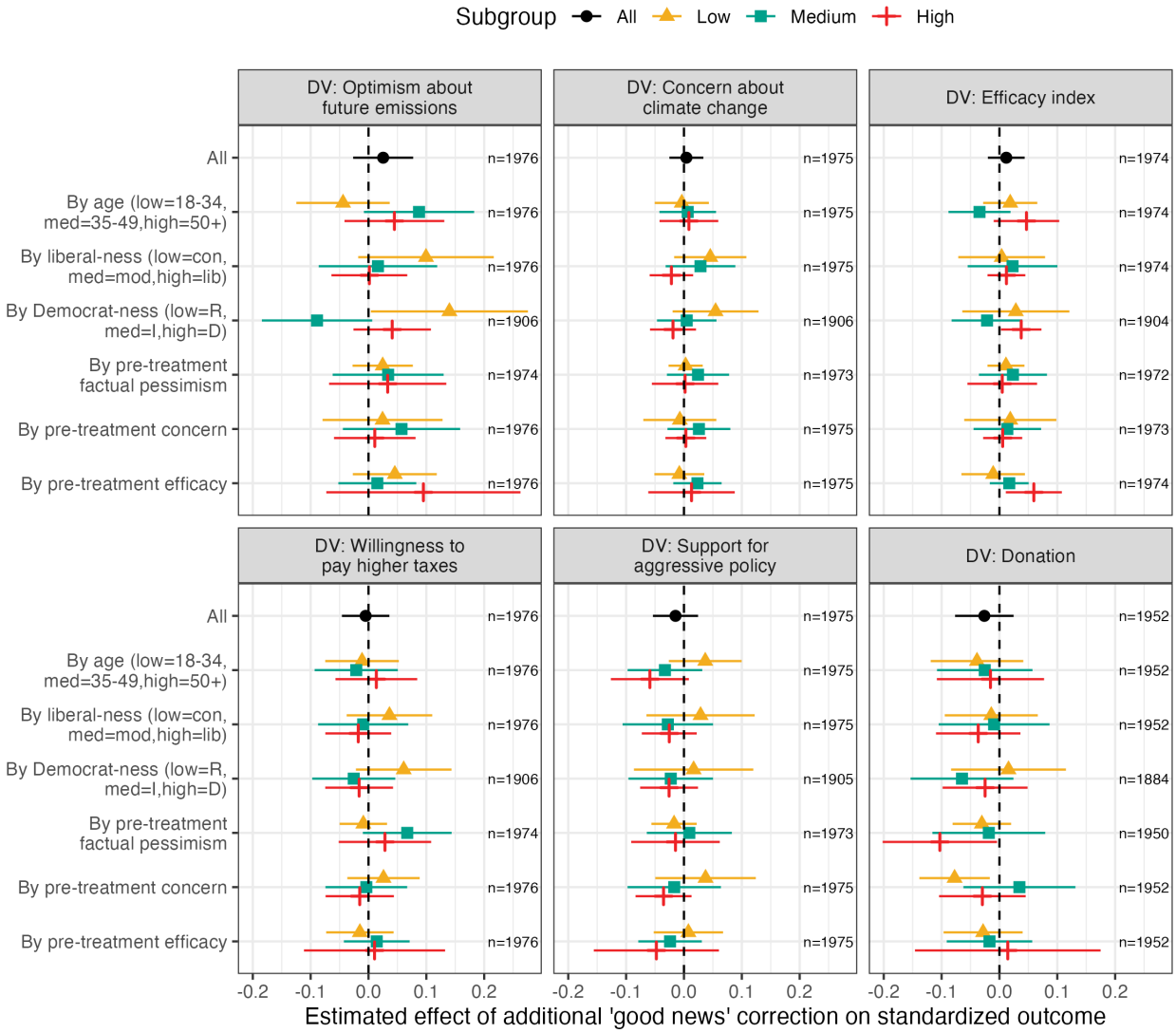

Figure 9: Effect of 'good news corrections' on six outcomes, on average and across subgroups

8.8 Testing for non-monotonic effects of additional pieces of 'good news"

An anonymous reviewer's comment raised the possibility that increasing the number of correct answers provided could have a non-monotonic effect on respondents' optimism about climate change mitigation. Specifically, the reviewer suggested that a respondent who is provided a single correct answer might infer that her (pessimistic) responses to the other questions are correct, making her more pessimistic than another respondent who is not provided any correct answers. To assess this possibility of non-monotonic effects, we regress each of our outcome variables on indicators for each possible number of correct answers (1, 2, and 3) and the same control variables as in the main analysis. The results, presented in Figure 10, show no evidence of non-monotonicity.

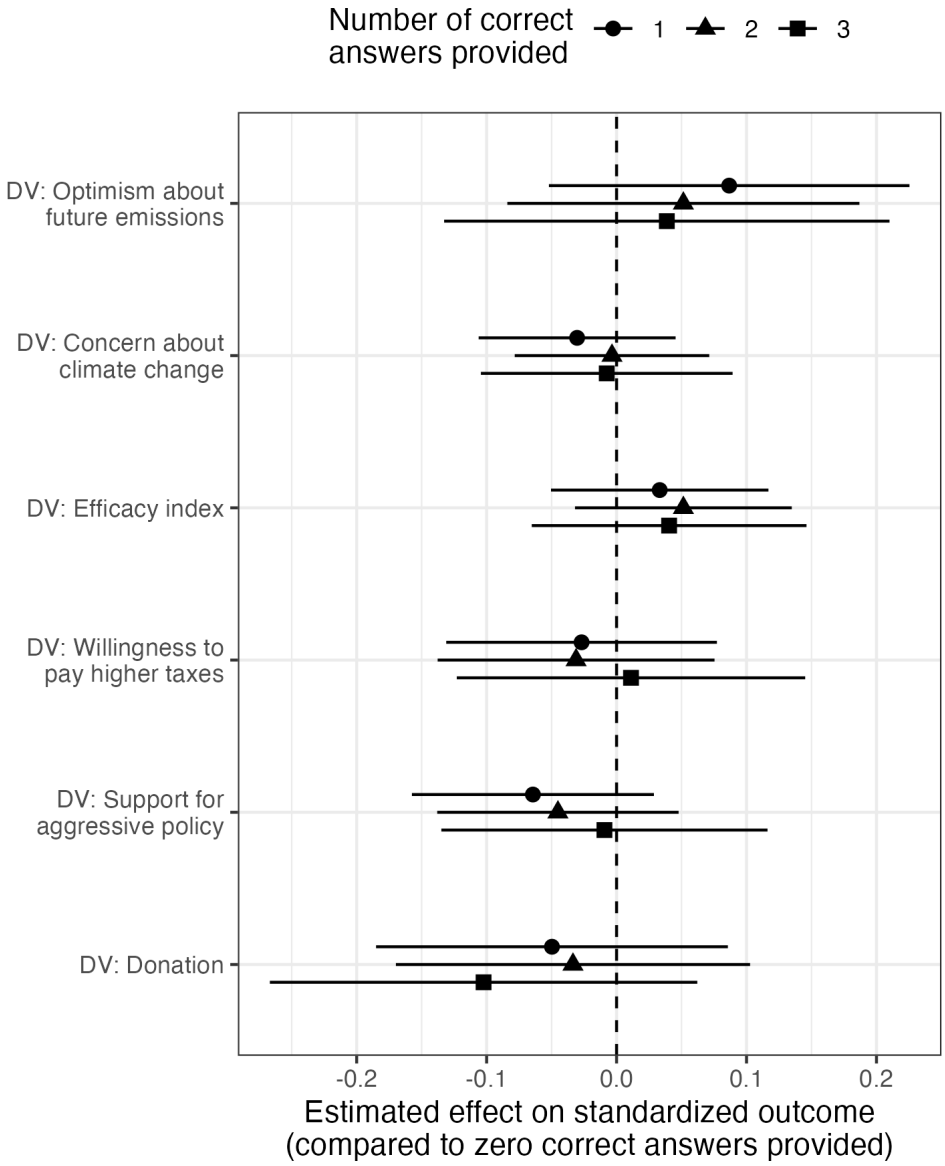

Figure 10: No evidence of non-monotonic effects of additional information on our outcome variables