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Framing climate change as a generational issue: Experimental effects on youth worry, motivation and belief in collective action

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Abstract

Generations differ in their contribution to climate change and susceptibility to its effects. Framing climate change as an intergenerational issue may therefore alter public engagement. We report a pre-registered, online experiment with a youth sample ($N = 500$, aged 16-24 years) that tested whether framing climate change information in generational terms affects (i) worry about climate change, (ii) perception of others' worry, (iii) belief in collective action and (iv) pro-environmental intentions. We also tested the effect of correcting misperceptions about how concerned older people are. Generational framing amplified worry about climate change, with limited effects on other measures. Providing accurate information on older people's worry boosted belief in collective action, particularly for the majority who initially underestimated it. The results have implications for communications with young people about climate change.

Keywords: climate change; young people; generations; social identity; framing; perception of others

Policy Highlights

- Highlighting generational differences in the causes and effects of climate change increases worry among young people but does not motivate action
- Most young people underestimate how worried older people are about climate change
- Perceptions of older people's worry correlates with belief in collective climate action
- Correcting misperceptions of older peoples' worry among those who underestimate it leads to stronger belief in collective action

1. Introduction

"We live in a strange world where children must sacrifice their own education in order to protest against the destruction of their future. Where the people who have contributed the least to this crisis are the ones who are going to be affected the most."

– Greta Thunberg

Older generations have contributed the most to the climate crisis, but younger ones will face far more of the consequences (Thiery et al., 2021). In recent years, social movements such as Fridays for Future have highlighted this generational unfairness to motivate young people to engage with environmental issues. At the same time, psychologists and medics are becoming increasingly concerned about "eco-anxiety" among young people, with recent medical papers calling for urgent research on improving understanding of it (Wu, Snell & Samji, 2020). Our aim was to provide the first experimental test of how framing climate change communications along generational lines affects young people's motivations.

Most straightforwardly, we tested whether intergenerational framing increases worry among young people (H1). Importantly, our aim was not to attribute eco-anxiety to generational framing alone. Worry may result from awareness of the real effects of climate change if action is not taken (Hagedorn et al., 2019) and engendering worry is not necessarily negative. Worry can be an important motivator for mitigation (Goldberg et al., 2020; Van der Linden, 2015; Verplanken, Marks & Dobromir, 2020), although the evidence is mixed and mostly correlational (Bouman et al., 2020; Brosch, 2021). From a social identity theory perspective, generational framing could motivate climate action by strengthening youth ingroup identity and signalling the norm that their generation is environmentally engaged (Gonzalez, Reynolds-Tylus & Skurka, 2021; Ross & Rouse, 2020). Hence, we hypothesised that such framing could motivate environmentalism (H2), which we measured through future intentions and support for climate policy.

However, it is also possible that this generational narrative could amplify worry without simultaneously boosting motivation to act. For example, highlighting generational differences in contributions to climate change could lead young people to believe older people are less worried than they are and hence less likely to support mitigation. This misperception could in turn lead to intergenerational conflict and demotivate young people from acting themselves (Masson & Fritsche, 2021). Hence, we tested whether generational framing not only increases self-reported worry about climate change among young people, but also whether it

alters how worried they perceive other young people and older people to be. We specifically hypothesised that generational framing would lead young people to perceive older people to be less worried about climate change (H3).

If generational framing induces intergenerational conflict, there is reason to suspect that it could demotivate action. The climate crisis is a collective action problem and requires all individuals – young and old – to change their day-to-day behaviour and to support systemic change (Fielding & Hornsey, 2016; Ostrom, 2010). A robust literature from behavioural economics identifies factors that boost cooperation in collective action problems, with evidence from both the lab and field (Fehr & Schurtenberger, 2018). One such factor is expectation that others will cooperate (e.g., Runge, 1984). Hence, since generational framing could reduce belief that older people will play their part, we hypothesised that generational framing could reduce belief in collective climate action (H4).

Note that such a finding would not imply a need to downplay the generational narrative. The science does suggest that younger and future generations will be adversely affected. However, if young people underestimate how worried older people actually are, collective climate action may be undermined. Indeed, people are rarely accurate when judging how others feel (Klein, 2018). Across age groups, more than three-quarters of the population in Europe report that climate change is a "very serious problem" (European Commission, 2021, p.25). Concern is particularly high in Ireland (Leiserowitz et al., 2021; Timmons & Lunn, 2022), where the current study was undertaken. Combining these statistics with the common media narrative of generational differences, it is likely that younger people underestimate worry among older people. Thus, we tested whether confronting young people with their misperception, by showing how their beliefs compare to accurate statistical information, further alters their belief in collective action. Providing people with accurate descriptions of others pro-environmental behaviours and norms can promote pro-environmental behaviour (Andre, Boneva, Chopra & Falk, 2021). It can also generate more positive out-group stereotypes and consequently strengthen belief in across-group cooperation by reframing climate change as a joint goal held by all generations (Fielding & Hornsey, 2016). We hypothesised that confronting younger people with accurate information on older people's worry would boost belief in collective action (H5a) and, specifically, belief that older people would play their part in the fight against climate change (H5b). We further hypothesised that this information would boost intentions to act pro-environmentally (H6) and that the effects

would be stronger among young people who initially underestimated how worried older people are (H7).

2. Method

The online study was programmed in Gorilla Experiment Builder (Anwyl-Irvine et al., 2020) and proceeded over multiple stages. Here we report findings from the first stages, which contained the study's primary experimental manipulations and measured worry about climate change, belief in collective action and pro-environmental intentions. Results from other stages, which measured knowledge of climate mitigation actions, views on the future and engagement with local outdoor amenities, are reported in Andersson, Timmons and Lunn (2022). The study received approval from the institutional Research Ethics Committee on 15th March 2020 and was pre-registered (https://osf.io/kmeh3/).

2.1 Participants

The sample consisted of 500 young people, aged 16 to 24 years (i.e. a "youth" sample), who were recruited by two market research and polling agencies.[1] Unlike most research on youth perceptions of environmental issues, there was no reliance on participant (or their school's) engagement in climate-rated activities to provide a convenience sample (see Lee, Gjersoe, O' Neill & Barnett, 2020). Our sample frame was the existing participants in two online survey panels designed to be representative of Ireland's general population. The agencies sent an email containing a link to the study to 18-24 year olds and parents of 16- and 17- year olds[2] on these panels. After clicking the link, respondents were informed on the first page that the study was about their views on the environment. Attrition rates at this point were very low (n = 5 exited the study once informed of the topic, with n = 7 exiting after this point). Participants were paid €3 for completing the study, which took 13 minutes on average.

Given the above approach to sampling, the study is unlikely to be biased towards highly-engaged youth. That said, comparing the socio-demographic characteristics of the sample against population data from Ireland's Central Statistics Office reveals that, in the end, women and people in education and training were overrepresented. The results we report control for socio-demographic characteristics and exploratory analyses found no interactions between gender or working status and our experimental manipulations. .

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[1] RED-C Research (www.redcresearch.ie) and Behaviour & Attitudes (www.banda.ie)
[2] Parents/guardians of 16- and 17-year olds were first required to consent to their child's participation in the study, before assent and participation was sought from the young person.

Table 1. Sample Socio-Demographics

		n	%	Population %[a]
Gender	Men	181	36.2	51.0
	Women	314	62.8	49.0
	Non-Binary/Other	5	1.0	
Age	16-19 years	234	46.8	46.8
	20-24 years	266	53.2	53.2
Working Status	In Education or Training	267	53.4	43.4
	Employed	206	41.2	47.9
	NEET[b]	27	5.4	8.7
Socio-Economic Status	Maternal Education: Degree or above	234	46.8	53.0[c]
	Maternal Education: Below Degree	266	53.2	47.0
Living Area	Urban	305	61.0	64.0
	Rural	195	39.0	36.0

[a] Population estimates are based on 2021 Central Statistics Office (CSO) data where possible and 2016 Census data otherwise.
[b.] Not-in-Employment-Education-or-Training
[c.] Population estimates for maternal education are estimated based on educational attainment of women in Ireland aged 45-54 years because the average age of maternity in 1998-2006 was between 30.1 and 31.1 years.

2.2 Materials, Design and Procedure

In the stages of the study relevant for this paper, participants were first asked questions about their own environment-related behaviour (e.g. diet, use of transport). Responses were used to personalise intention-based questions later in the study. Next, they were asked to select from a list of reasons why they thought it was important to protect nature (adapted from Gustafson, Pace, Singh & Goldberg, 2022). They were then informed that the focus of the study was climate change. All participants read the same definition of climate change and equivalent information about the scientific consensus that climate change is happening and that the effects include extreme weather events such as storms, droughts and flooding. However, half the sample (*n* = 250) were randomly assigned to read this information framed in a way to highlight generational differences, inspired by recent media activity.[3] They were told that

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[3] For example, https://fridaysforfuture.org/what-we-do/activist-speeches/

scientists have agreed for more than 30 years that climate change is happening but "older generations did not do enough to stop it." They also read that "future generations are more likely to experience the worst effects" of climate change and that "young people around the world have started to criticise older people and governments for not taking climate change seriously enough." The control condition ($n = 250$) read the same information but without reference to different generations. Online Supplementary Material contains the full text.

All participants were then asked how worried they themselves are about climate change and how worried they think (1) older generations (aged 40 and over),[4] (2) other people their own age in general, and (3) their close friends are. Responses were elicited on slider scales that ranged from 1 (not at all worried) to 7 (extremely worried) and allowed responses up to two decimal points. Hence this part of the design was between-groups, with just two groups.
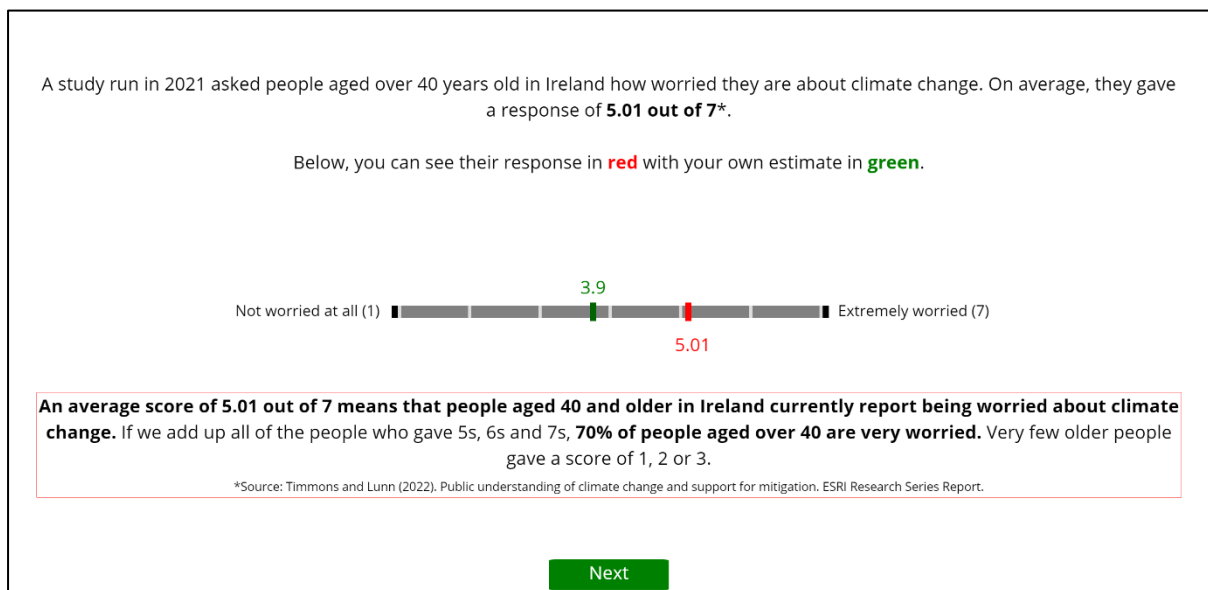

Figure 1. *Example screen showing participant's guess and accurate OG worry information.*

After making their guess, approximately half of participants ($n = 257$) were randomly assigned to receive feedback on the actual level of worry among older generations. They were informed that data collected in 2021 showed that people aged over 40 in Ireland on average gave a response of 5.01 out of 7 on the same scale they had just rated. They were reminded of their own guess and shown how it compared to this "correct" answer (Figure 1).

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[4] We initially considered separating older generations into those aged 40-59 and those aged 60+, but data from Timmons and Lunn (2022) showed no differences in the level of worry between these generations in Ireland.

To encourage participants to reflect on the information, they were asked how surprised they were by the findings before proceeding with the study. The control condition ($n = 243$) proceeded with the study without seeing this information. Hence the design for subsequent measures was a 2 (generational frame, no frame) x 2 (older generation ("OG") worry information, no information) between-groups design and there was a minimum of 116 participants per cell.

Participants were then informed that they were starting a new stage of the study which was about ways to tackle climate change. They were asked three questions about their belief in collective action to mitigate climate change. The first asked to what extent they agreed with the statement that "it's likely that most people in Ireland will play their part in the joint effort to address climate change." The other two questions specifically asked about young people and older people playing their part. All responses were recorded on 1 (completely disagree) to 7 (completely agree) rating scales.[5]

Table 2. List of Pro-environmental Intentions and Policies

Intentions	Policies
Eat less meat	Higher taxes on petrol and diesel to fund more public transport.
Eat no meat (i.e. vegetarian or plant-based/ vegan)	Ban on domestic flights (e.g. Dublin to Shannon) unless to provide an essential service.
Buy more locally-produced food (or try to convince those you live with to)	Ban on cars in certain parts of towns and city centres (e.g., implement car-free zones).
Buy fewer new things (e.g. buy second hand or re-use old things, such as clothes)	A limit on the number of flights any person can take in a year.
Buy energy efficient lightbulbs (or try to convince those you live with to)	Ban use of environmentally harmful subsidies in production and import of goods even if it leads to everyday products becoming more expensive.
Avoid single-use plastics	Lower taxes for imported goods that are carbon neutral (with higher taxes for ones that are not).
Walk, cycle or use public transport most journeys instead of getting a lift/going by car	Higher taxes on meat, with money collected going to invest in ways to make farming more environmentally friendly
Take fewer flights (or try to convince those you live with to)	Making renewable energy sources, such as wind or solar, mandatory even if they cost more.
Use a separate bin for food waste (or try to convince those you live with to)	Higher taxes on homes that are not energy efficient, with money collected going towards grants for retrofitting homes (i.e. to pay some of the cost of making homes more energy efficient)

[5] At the end of the study, participants in the OG Worry condition were asked how accurate they thought the worry estimate from Timmons and Lunn (2022) was. A majority (83.4%) gave a response at the midpoint or above on the scale. Controlling for this response does not alter the results.

Use a separate bin for recycling (or try to convince those you live with to)	Fines for businesses that have emissions above a certain level

Participants later saw a series of pro-environmental behaviours related to their diet, use of transport and consumption habits. They were asked how likely they would be to do each one in the near future (on a rating scale from 1 "not at all likely" to 7 "extremely likely"). These questions were tailored to the participant (e.g. only those who reported eating meat were asked about their willingness to reduce their meat consumption). They also rated the extent to which they would like to see a list of climate policies enacted in the future, on a scale from 1 "not at all" to 7 "a great deal." The individual items are shown in Table 2. Full details on responses are available in the Supplementary Material.

3. Results

Figure 2 shows the distribution of primary motivations to protect nature. "For the sake of future generations" was the most commonly selected reason, chosen by almost half of respondents. Hence many young people are more motivated by protecting future generations than, for example, preventing natural disasters in the near future (binomial test of proportions, $Z = 25.87$, $p < .001$).

The rest of this section presents the effect of generational framing on self-reported worry and estimates of others' worry, followed by the effects of framing and seeing OG worry estimates on belief in collective action and pro-environmental intentions. As specified in the pre-registration, all models included socio-demographic controls for gender, age, working status, mother's educational attainment (as a proxy for socio-economic status) and living area. As responses were elicited on rating scales, we used ordinal regression models. Where necessary to meet assumptions for proportional odds (e.g. if cell sizes were small, $n < 20$), we re-categorised outcome variables.[6]

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[6] Where responses are missing from individuals, they are excluded from those specific models. Robustness checks showed that none of the below findings were sensitive to category definitions (which were decided prior to any inferential statistics). The results were the same using OLS models, with bias accelerated CIs to account for skew where necessary. Further robustness checks excluding respondents who failed an attention check or were within the fastest 5% to complete the study showed similar results.
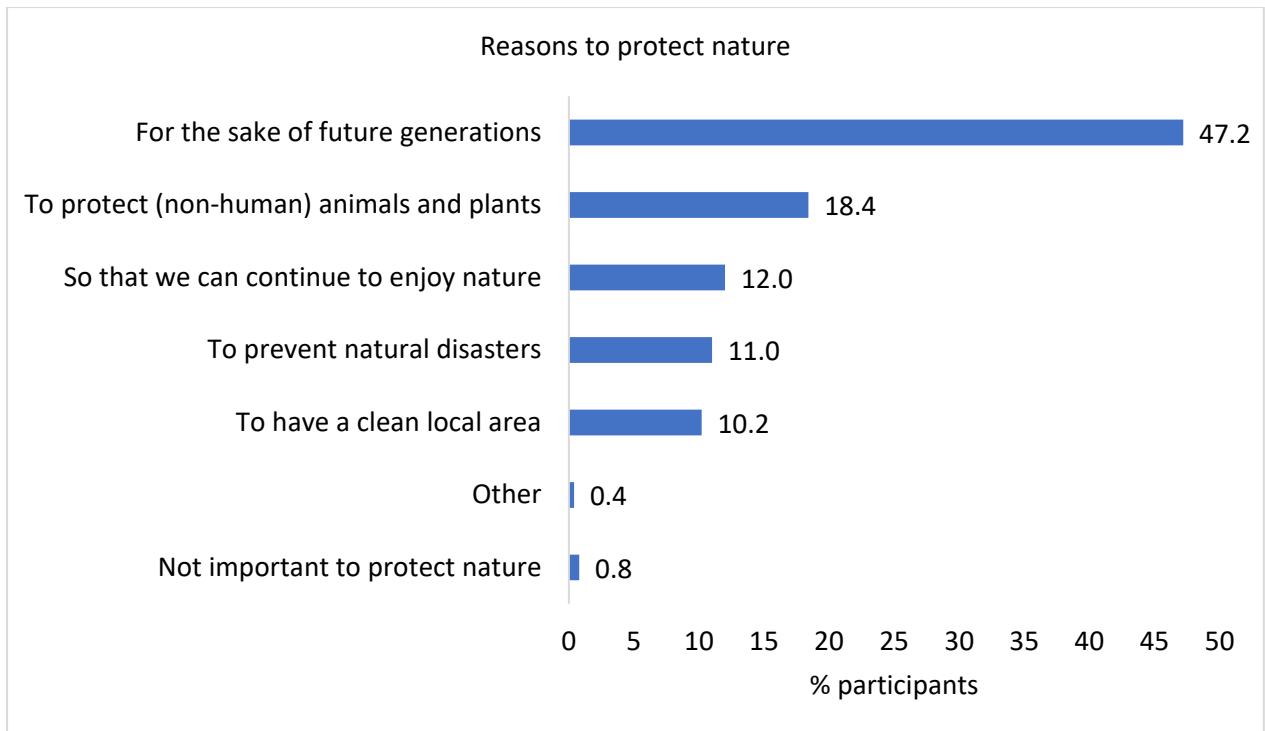
Figure 2. Percentage of participants who selected each reason for protecting nature.

3.1 Worry

Participants reported that they themselves were very worried about climate change, with responses showing a strong negative skew ($M = 5.59$, $SD = 1.33$; Figure 3). Model 1 in Table 3 shows that participants in the generational frame condition reported being more worried about climate change than those in the control condition ($M = 5.76$, $SD = 1.18$ vs. $M = 5.42$, $SD = 1.45$, respectively, $d = 0.25$). Figure 4 shows that 29.2% of those in the control condition rated their worry as less than 5 on the scale, compared to 18.8% of those in the generational frame condition. This represents a change in response of one-in-three of those who otherwise would have reported relatively low levels.
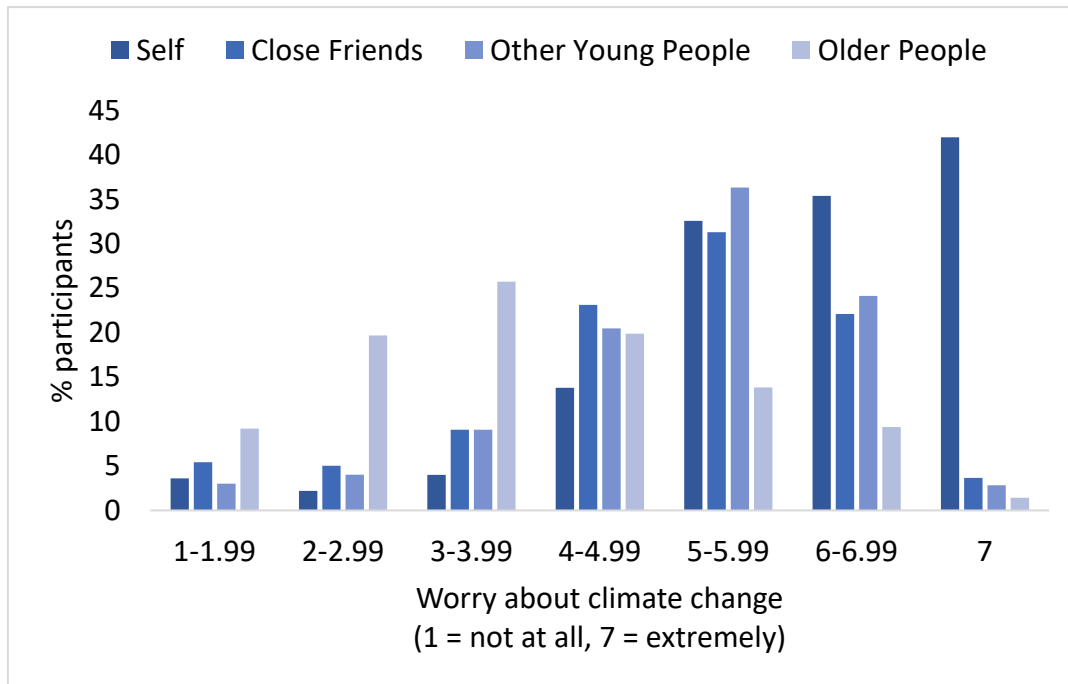
Figure 3. Distribution of responses to the four questions about climate change worry.

Wilcoxon Signed Rank tests showed that participants rated themselves as more worried about climate change than their close friends ($M = 4.99$, $SD = 1.41$; $Z = 10.25$, $p < .001$, $r = .46$) and other young people ($M = 5.17$, $SD = 1.28$; $Z = 7.19$, $p < .001$, $r = .32$). They rated other young people to be more worried than their close friends ($Z = 3.27$, $p = .001$, $r = .15$). Model 2 in Table 3 shows that participants who read about climate change in the generational frame estimated their close friends to be more worried than those in the control condition ($M = 5.14$, $SD = 1.32$ vs. $M = 4.85$, $SD = 1.48$, respectively, $d = 0.21$). The effect on estimates of peer worry was non-significant but in the same direction and of similar magnitude (Model 3; $M = 5.28$, $SD = 1.19$ vs. $M = 5.03$, $SD = 1.19$, respectively, $d = 0.19$).

Table 3. Ordinal Logistic Regression Models Predicting Worry Estimates

	1 Self		2 Close Friends		3 Other Young People		4 Older People	
	Coefficient [95% CI]	*p*-value	Coefficient [95% CI]	*p-value*	Coefficient [95% CI]	*p*-value	Coefficient [95% CI]	*p*-value
Generational Frame *(Ref: No Frame)*	0.36* [0.03, 0.69]	.017[a]	0.37* [0.04, 0.70]	.029	0.22 [-0.11, 0.56]	.191	0.29 [-0.05, 0.62]	.955 [a]
Socio-demographic Controls	Yes		Yes		Yes		Yes	
Participants	500		500		500		500	

*$p < .05$. [a] One-tailed, given pre-registered directional hypothesis.

Estimates of how worried older people are showed a slight positive skew and were much lower than the other worry estimates ($M = 3.9$, $SD = 1.50$).[7] A majority (74%) gave a response below the "correct" estimate of 5.01 and hence could be considered "underestimators". Model 4 shows no evidence for the hypothesised effect that generational framing would elicit lower estimates of older generations' worry. In fact, the difference, although non-significant, is in the opposite direction to our prediction and shows a pattern similar to the effect on self-worry (Figure 4).
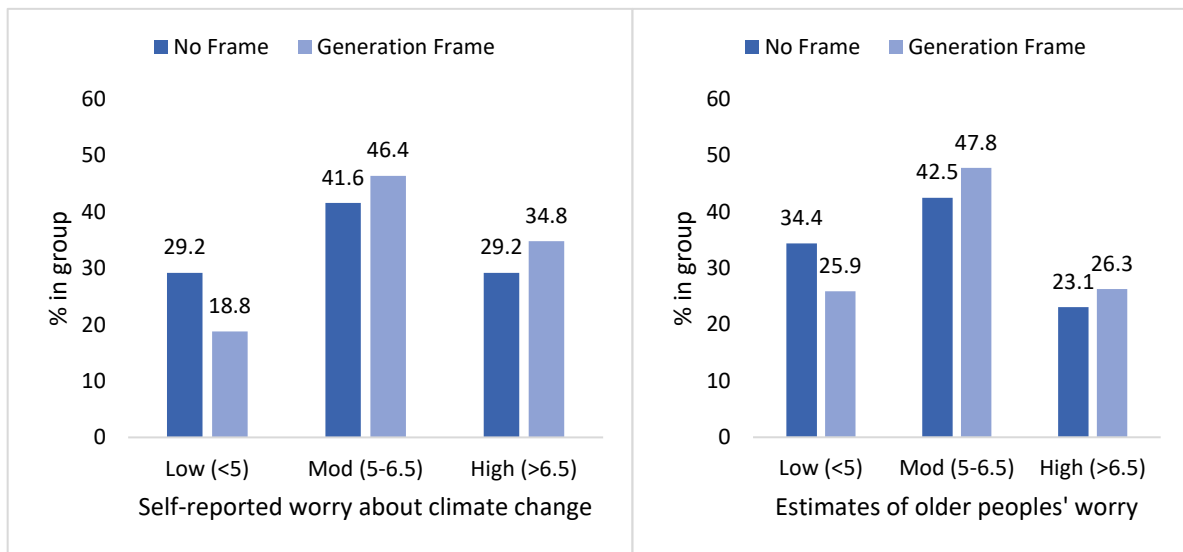

Figure 4. Self (left) and older people (right) worry ratings by frame condition.

Table 4. Ordinal Logistic Regression Models Predicting Belief in Collective Action

	1		2	
	Coefficient [95% CI]	*p*-value	Coefficient [95% CI]	*p*-value
Generational Frame (*Ref: No Frame*)	0.19 [-0.14, 0.52]	.867 [a]	0.19 [-0.15, 0.53]	.860 [a]
Shown OG Worry (*Ref: Not Shown*)	.15 [-0.18, 0.49]	.181 [a]	-0.78* [-1.47, -0.10]	.024
Underestimated OG Worry (*Ref: Not Underestimated*)			-1.63*** [-2.19, -1.08]	<.001
Underestimated + Shown OG Worry			1.34** [0.55, 2.13]	.001
Socio-Demographic Controls	Yes		Yes	
Participants	499		499	

*$p < .05$; **$p < .01$; ***$p < .001$. [a] One-tailed, given pre-registered directional hypothesis.

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[7] A Wilcoxon Signed-Rank test against the next lowest group (close friends) was highly significant, $Z = 12.02$, $p < .001$.
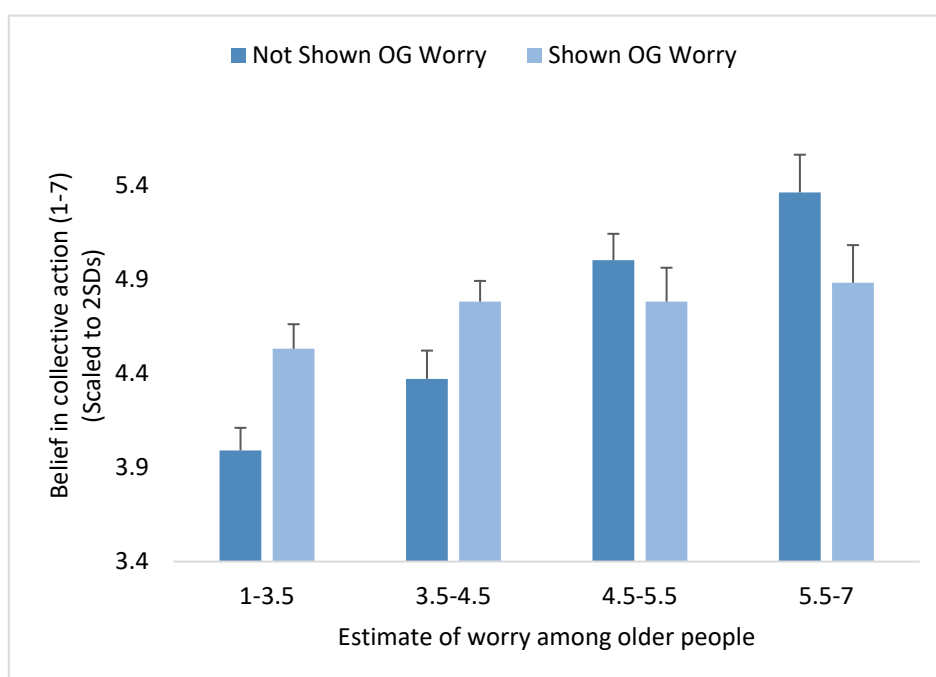
Figure 5. Belief in collective action by older generation worry estimate and whether accurate information was seen.

3.2 Belief in Collective Action

Belief in collective action was concentrated slightly above the midpoint of the scale ($M = 4.61$, $SD = 1.23$) and, as hypothesised, was significantly correlated with perceptions of older generations' worry, $r = .32$, $p < .001$. Model 1 in Table 4 shows that there was no overall effect of frame or seeing OG worry information on belief in collective action. Model 2 includes an interaction term between whether the participant saw the OG worry information and had underestimated OG worry when asked. The model shows that seeing information on OG worry amplified beliefs in collective action among those who underestimated how worried older generations are and weakened beliefs among the minority who had overestimated it (i.e. "overestimators"). Figure 5 shows that the OG worry information diminished the relationship between participants' worry estimate and belief in collective action. There was no main effect of generational frame[8] nor was there an interaction between it and seeing OG worry.

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[8] The lack of effect of generational frame is supported by an equivalence test showing that the difference between the groups is not statistically different from zero, $t(498) = 0.52$, $p = .300$.

Table 5. Ordinal Logistic Regression Models Predicting Specific Collective Action Beliefs

|	1 Younger People		2a Older People		2b Older People	
	Coefficient [95% CI]	*p*-value	Coefficient [95% CI]	*p*-value	Coefficient [95% CI]	*p*-value
Generational Frame (*Ref: No Frame*)	-0.11 [-0.43, 0.22]	.742 [a]	-0.05 [-0.36, 0.27]	.282 [a]	-0.11 [-0.43, 0.21]	.243 [a]
Shown OG Worry (*Ref: Not Shown*)	-0.13 [-0.45, 0.20]	.445	0.56*** [0.24, 0.88]	<.001 [a]	-0.64 [-1.28, 0.01]	.053
Underestimated OG Worry (*Ref: Not Underestimated*)					-2.52*** [-3.08, -1.97]	<.001
Underestimated + Shown OG Worry					1.75*** [1.00, 2.50]	<.001
Socio-Demographic Controls	Yes		Yes			
Participants	499		498		498	

***$p < .001$. [a] One-tailed, given pre-registered directional hypothesis.

Looking at differences in perceptions of different generations, a Wilcoxon Signed Rank test showed that participants believed young people are more likely to play their part than older people ($M = 5.37$, $SD = 1.23$ vs. $M = 4.17$, $SD = 1.40$; $Z = 13.11$, $p < .001$, $r = .59$). Model 1 in Table 5 shows that there was no effect of framing or seeing OG Worry information on perceptions of younger people, but seeing the OG Worry information boosted beliefs that older people would play their part (Model 2a, Table 5). (There was no interaction effect between frame and seeing OG Worry.) An exploratory analysis testing for an interaction between seeing accurate worry information and previously underestimating worry showed that the effect on perceptions that older people would play their part was driven by those who had previously underestimated worry, whereas the minority who had not underestimated expressed marginally weaker beliefs in collective action after seeing the correct information (Model 2b, Table 5).

Table 6. Ordinal Logistic Regression Models Predicting Pro-Environmental Intentions

	1		2	
	Coefficient [95% CI]	*p*-value	Coefficient [95% CI]	*p*-value
Generational Frame (*Ref: No Frame*)	0.06 [-0.27, 0.40]	.360 [a]	0.06 [-0.28, 0.40]	.359 [a]
Shown OG Worry (*Ref: Not Shown*)	-0.09 [-0.43, 0.24]	.445	-0.72* [-1.40, -0.05]	.036
Underestimated OG Worry (*Ref: Not Underestimated*)			-1.04*** [-1.58, -0.50]	<.001
Underestimated + Shown OG Worry			0.90* [0.12, 1.68]	.024
Socio-Demographic Controls	Yes		Yes	
Participants	500		500	

*p <.05; ***p < .001. [a] One-tailed, given pre-registered directional hypothesis.
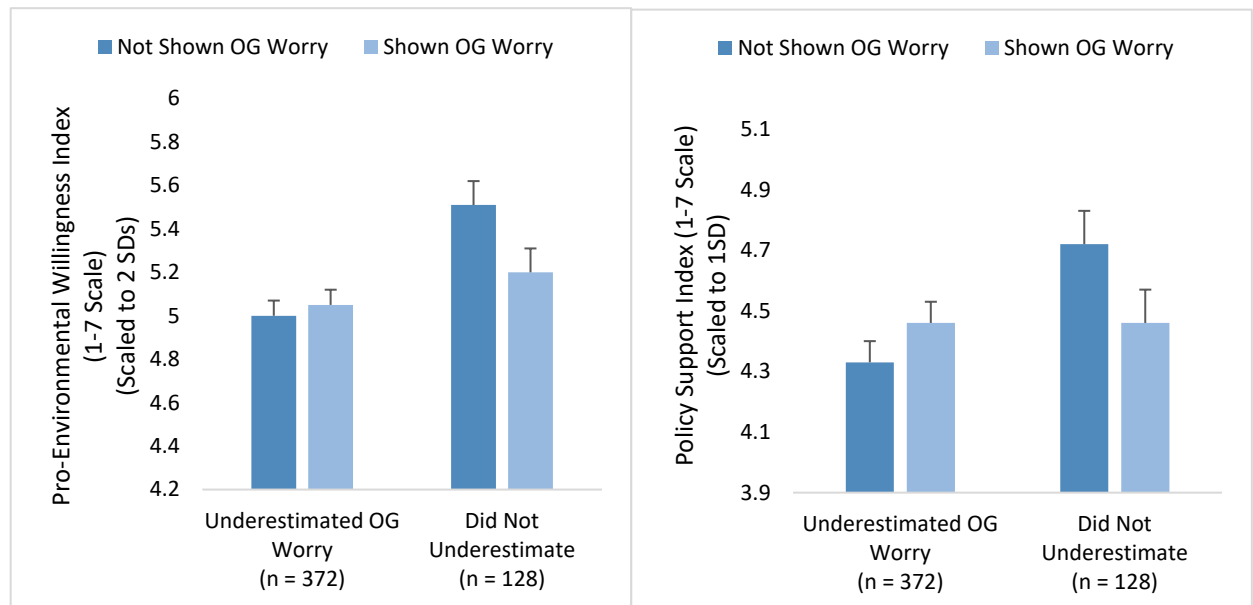
Figures 6a and 6b. Average pro-environmental willingness (left) and policy support (right) scores by whether OG worry was shown and had been previously underestimated. Error bars are the standard error of the mean.

3.3. Pro-Environmental Intentions

To test for effects on pro-environmental intentions, we created a willingness index by averaging responses across all behaviours (α = .73) and then categorising participants into low (4.5 or less; 24.2% of participants), moderate (4.6 to 5.6; 49.6%) and high (5.7 or above; 26.2%) willingness. Model 1 in Table 6 shows there was no effect of generational frame or seeing OG worry information. Model 2 presents an exploratory analysis testing for an interaction between underestimating older generations' worry and seeing the OG worry

estimate on future intentions. The model shows that the OG worry information diminished intentions to act pro-environmentally among the minority of those who overestimated older generations' worry, but had no significant effect on those who underestimated it (Figure 6a).

Table 7. Ordinal Regression Models Predicting Policy Support

	1		2	
	Coefficient [95% CI]	*p*-value	Coefficient [95% CI]	*p*-value
Generational Frame (*Ref: No Frame*)	0.31 [-0.02, 0.65]	.066	0.31 [-0.02, 0.65]	.067
Shown OG Worry (*Ref: Not Shown*)	0.05 [-0.28, 0.38]	.756	-0.30* [-0.95, 0.35]	.036
Underestimated OG Worry (*Ref: Not Underestimated*)			-0.52 [-1.05, 0.00]	.051
Underestimated + Shown OG Worry			0.50 [-0.26, 1.26]]	.199
Socio-Demographic Controls	Yes		Yes	
Participants	500		500	

*p <.05. One-tailed, given pre-registered directional hypothesis.

3.4 Policy Support

We created another index for policy support by averaging responses across all policies (α = .89) and then categorising participants into low (3.8 or less; 26.9% of participants), moderate (3.9 to 5.4; 50.3%) and high (5.5 or above; 22.8%) support. Model 1 in Table 7 shows that those who saw the generational frame were marginally more supportive of future climate policy than those who didn't (*M* = 4.53, *SD* = 1.3 vs. *M* = 4.38, *SD* = 1.3, respectively, *d* = 0.12). There was no main effect of seeing OG worry information. Model 2 presents the same exploratory analysis as before. The results show that those who did not underestimate worry and saw OG information were less supportive of policy than those who did not see the information, but the interaction coefficient for those who underestimated worry is non-significant. The pattern, however, is similar to the descriptives for the behaviour index (Figure 6b).

4. Discussion

The results show that many 16 to 24 year olds report that the impact of the climate crisis on future generations motivates them to protect the environment. Our study presents the first experimental test of framing climate communications in generational terms. The results show that highlighting generational differences in the causes and effects of climate change leads to higher levels of worry, compared to standard information on climate change (supporting H1). It does not enhance intentions to act more pro-environmentally in the future, but it may boost support for pro-climate policies (giving weak evidence for H2).

The results also show that generational framing does *not* lead to belief that older people are less worried, nor does it diminish belief in collective action (contra H3 and H4). However, a large majority (three in four) of young people underestimate the level of worry older people report. Confronting young people with this misperception boosts belief in collective climate action and, specifically, that older people are likely to play their part to tackle climate change (supporting H5a, H5b and H7). However, overestimators may be demotivated after seeing the correct information: they have lower intentions to act pro-environmentally in the future compared to other young people who overestimate worry but do not learn what older people report when asked (contra H6).

The implications of these findings are not straightforward and depend on policy aims. If communicators wish to increase worry among young people, framing climate change communications in generational terms (as many speeches do) is likely to be effective. Our findings suggest that doing so is unlikely to foster intergenerational conflict, but is also unlikely to motivate behaviour change. The benefit seems limited to a small increase in support for pro-climate policies.[9] However, if communicators wish to reduce worry among young people, for example to attempt to address eco-anxiety (Wu et al., 2020), speaking about climate change in neutral, non-generational terms is likely to help, without undermining youth belief in collective action or existing intentions to act pro-environmentally (although there may be some risk to support for some climate policies.)

Another consideration is the usefulness of correcting misperceptions about older people's level of worry. In countries such as Ireland, where concern for the climate is high, many

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[9] Further research is needed to identify which types of policies are affected. Exploratory analyses not reported here showed positive coefficients on all policies except those relating to household energy use (e.g. higher taxes on inefficient homes).

young people are likely to underestimate it. Doing so is associated with lower belief in collective action, but providing accurate information can help promote higher beliefs. However, if statistical information is shared – as in our experiment – the minority of overestimators who see this information are likely to reduce their intentions to act in pro-environmental ways. Hence a sensible approach for policy may be to communicate the level of concern in general terms. For example, communicating that most older adults are very worried about climate change may correct misperceptions among majority "underestimators" while remaining congruent with beliefs among the remaining minority.

Our aim was to test the effects of generational framing on youth views on climate change and the likelihood of climate action. One limitation of this approach is that we do not test how framing climate change as a generational issue affects older generations. It is not clear whether the current narrative is motivating older generations to "do better" or if it leads them to perceive heightened intergenerational conflict and to disengage from taking climate action (Masson & Fritsche, 2021). Further research is needed to allow for a holistic evaluation of this common climate change narrative on different audiences.

More broadly, this study emphasises the need for experimental tests of communications about climate change. The results show that while some effects align with reasonable expectations – for example that generational framing leads to higher levels of worry among young people – there are potential knock-on effects on other important psychological variables and for different subgroups of the population. This experiment presents a first step in assessing the potential effects of a common media narrative. From an eco-anxiety perspective, it's not clear that this narrative is the most helpful – particularly given minimal effects on motivating climate action.

This paper began with a characteristically incisive quote from Greta Thunberg, who has repeatedly highlighted the ironies embedded in the intergenerational politics of climate change. Yet our results might question how much the intergenerational framing of the crisis contributes to the "Greta Thunberg Effect" (Sabherwal et al., 2021). Perhaps, regardless of age or generation, it is how her contributions personalise and impose a narrative on an often abstract and technical subject that gives them force.

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