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Perceived responsibility towards future generations and environmental concern: Convergent evidence across multiple outcomes in a large, nationally representative sample

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ABSTRACT

A great number of social and environmental issues our society is facing today (e.g., climate change) necessitate action in the present in order to benefit future others. Perceptions of responsibility towards future generations have been shown to increase intergenerational prosociality and combat intertemporal discounting. However, the degree to which these findings are generalizable across samples and valid in the context of environmental issues remains unknown. We utilized data obtained from the Public Religion Research Institute to examine the association of perceived responsibility towards future generations with proenvironmental attitudes in a large and representative sample of the US population. Across a wide variety of proenvironmental outcomes and controlling for key demographic covariates (e.g., political ideology, religiosity), our results suggest that perceived responsibility towards future generations has a robust relationship with proenvironmental attitudes. Increasing and leveraging perceptions of responsibility towards future others may be a powerful tool for promoting intergenerational environmental concern and action.

A growing body of research has investigated intergenerational environmental decision making in an effort to inform and improve efforts to address major environmental issues such as climate change and habitat destruction. This research has highlighted that there are several factors that influence intergenerational environmental decision-making. These include cultural and personal values (Corner et al., 2014; Kasser, 2011), cognitive and affective heuristics (Hardisty et al., 2010; Markowitz et al., 2013), different social and moral norms (Stern et al., 1999), individual legacy motivations (Bang et al., 2017; Dickinson, 2009; Grolleau et al., 2020; Hurlstone et al., 2020; Wade-Benzoni et al., 2012, 2010; Zaval et al., 2015), as well as feelings of gratitude (Barnett et al., 2019; Noblet et al., 2015; masked for review; Watkins & Goodwin, 2019).

The long time-horizons involved in issues such as climate change, particularly with respect to the negative projected impacts on far future generations, represent one major barrier to ameliorative action by the present generation (Gardiner, 2006; Hornsey & Fielding, 2019). In part this is due to a well-described phenomenon in the behavioral and economics literature, namely, (hyperbolic) temporal discounting, namely the tendency to place less value on the future consequence of a phenomenon due to its increased temporal distance from the present. (Hardisty & Weber, 2009). In the present case, we are particularly focused on intergenerational discounting, that is, discounting of future benefits and harms that acrue to future others (ie., not to our future selves). Various psychological explanations for such discounting of future benefits (and thus the moral worthiness of present action to protect future others) have been proposed (Frederick et al., 2002). And yet, we know from various strands of research that people can and do make beneficient decisions on behalf of future others (for a review see Wade-Benzoni & Plunkett-Tost, 2009) and that certain factors make such action more likely (e.g., salience of legacy motives, Zaval et al., 2015; perceived overlap between present and future self, Hershfield, 2011; consideration of the future consequences of one's actions: Strathman et al., 1994). Recent theoretical and empirical work suggests another critical factor that may represent a powerful leverage point for promoting prosocial action across time: perceived responsibility to protect or act on behalf of future generations (Wade-Benzoni & Plunkett-Tost, 2009).

In a recent series of experiments, Watkins and Goodwin (2019) find that reflecting on sacrifices made by previous generations increased perceived moral obligation towards future generations. However, the link between increased perception of moral obligation towards future

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generations and pro-environmental attitudes or motivations only emerged in one out of the five studies reported, hinting at the potential absence of an association between moral obligation for future others and pro-environmental attitudes. Still, the research suggests that making a sense of responsibility towards future others salient at the time of decision-making might help promote intergenerational concern. Thus, although there is a link between a sense of obligation for future generations and prosociality, there is a lack of conclusive evidence for a relationship between perceived obligation to future others and pro-environmental attitudes (e.g., Watkins & Goodwin, 2019).

Given the lack of generalizable empirical research on perceived responsibility towards future generations and proenvironmental action, the current investigation had two primary goals. First, our aim was to use a large, nationally representative sample to conceptually replicate past work which finds that perceived responsibility (or alternatively obligation) towards future generations is associated with increased prosociality in intergenerational attitudes and decision-making (e.g., Barnett et al., 2019; Noblet et al., 2015; Watkins & Goodwin, 2019). Second, we sought to expand upon these findings by investigating a broad array of environmental outcomes to provide a more holistic picture of the effect that one's perceived responsibility for future others has on their environmental concern and action. We hypothesized that individuals who reported greater perceived responsibility for future generations would report elevated concern for the environment, even after controlling for key predictors of proenvironmental attitudes (e.g., religiosity, political ideology). To test this hypothesis, we used publicly available data collected via the Public Religion Research Institute (PRRI) in collaboration with the American Academy of Religion (AAR).

1. Methods

1.1. Participants

The Religion, Values and Climate Change Survey was developed and fielded by the PRRI and the AAR from September 18th until October 8^{t}, 2014. Detailed information regarding the survey, can be found at the PRRI website: https://www.prri.org/research/believers-sympathizers-skeptics-americans-conflicted-climate-change-environmental-policy-science/. A nationally representative sample of the American population consisting of 3022 participants was collected. From this, 2997 participants provided answers to the measures included in our analysis. The sample was nearly evenly split in terms of gender, with 1480 participants being male, and 1517 being female. In terms of race, 2229 participants were White, 375 where Black, 73 were Asian, 105 were of mixed race, 30 were Native American, 30 were Latino/Hispanic, and 155 gave no answer or reported being of some other race. The average age was 51.44 years ($SD = 18.97$).

1.2. Materials

Our aim was to be as inclusive as possible in an effort to avoid any bias in our selection. Thus, we searched the survey and consequently included all available items which matched our research questions and aims. We found one single-item measure which captured perceptions of responsibility towards future generations (our predictor variable). We then found 18 measures focusing on environmental outcomes. Of these, six focused on support for pro-environmental policies. Two captured endorsement of pro-environmental values and beliefs. Another two inquired about concern for climate change and global warming. Finally, eight items captured individual differences in belief in and acceptance of climate change and global warming. Four of these items were dichotomous.

The following demographic covariates were also available: political conservatism, importance of religion in one's life, age, race, gender, family income, and educational level. All of these measures were assessed with a single item each. Finally, a two-item measure of news consumption was included and retained for our analysis. For the sake of parsimony and to avoid repetition, given the large number of available measures, we provide a summary of all the variables included in the study, together with descriptive statistics, reliability estimates, and an example item for each measure in Table 1.

2. Results

2.1. Predictors of environmental concern: the role of perceived responsibility for future generations

All analyses were performed in SAS version 9.4. We first estimated bivariate (for linear outcomes) and biserial (for dichotomous outcomes) correlations. We then computed linear regressions for all continuous outcome measures, and logistic regressions for dichotomous outcome measures. We also regressed all measures of environmental concern on perceived responsibility towards future generations, political conservatism, the importance of religion in one's life, consumption of news, family income, education level, race, and gender. We included these measures as covariates in supplementary analyses because of extant research suggesting that they influence environmental concern (e.g., Klineberg et al., 1998; Pearson et al., 2016). For the raw correlations (see Table 2), perceived responsibility for future generations was significantly and positively correlated with every single outcome (*r*s ranging from 0.11 to 0.65, all ps $< .001$). Increased perceived responsibility for future generations was associated with more pro-environmental attitudes for every single outcome variable, controlling for all covariates: *b*s ranging from 0.12, to 0.55, all *p*s $< .001$. For a detailed look at these regressions, see Table 2. Results for family income, education level, race and gender are provided in Table S2 in the Supplementary Materials. Thus, with and without accounting for the association of relevant covariates, perceived responsibility for future generations was consistently associated with increased environmental concern.

2.2. Correlates of perceived responsibility for future others

The role of such perceived responsibility in combatting temporal discounting and promoting intergeneration environmental concern becomes even more important when one considers that it is mainly not or only weakly associated with measures that have been shown to negatively influence pro-environmental outcomes. In particular, increased perceived responsibility for future generations were weakly negatively correlated with political conservatism: $r = -.11$, $p < .001$, and weakly positively correlated with being male: $r = .10$, $p < .001$, and consumption of news: $r = .07$, $p < .001$. Further, no significant association was observed with income, education, or ethnicity/race (estimated by a biserial correlation).

3. Discussion

The current study establishes a meaningful, unique and robust relationship between perceptions of responsibility towards future others and proenvironmental policy preferences and concern. Across a wide diversity of outcome measures, and controlling for key socio-demographic variables known to correlate with proenvironmental orientations, we show that Americans who report stronger feelings of perceived responsibility towards future others are more engaged with and concerned about environmental issues, particularly climate change. The fact that this relationship emerged independent of political, religious and other key social identities reinforces the conclusion that such perceptions of responsibility may represent a key leverage point for promoting greater environmental issue engagement amongst a wide diversity of subgroups within the American public.

The present work both conceptually replicates past work as well as extends it in several important ways. First, we re-test extant work

Table 1
Detailed information about the measures included in the PRRI/AAR 2014 religion, values and climate change survey.

Measure	Items	Mean	SD	Cronbach's α	Range	Example item
Perceived responsibility for future generations	1	4.35	0.78	na	1–5	How important... living up to our responsibility to protect future generations?
Political Conservatism	1	3.18	1.05	na	1–5	In general, would you describe your political views as...? (very liberal - very conservative)
Importance of Religion	1	2.88	1.02	na	1–4	Which of the following comes closest to how you think about the place of religion in your life?
Following the news	2	3.01	0.85	0.58	1–4	How much do you enjoy keeping up with the news and current events?
Family Income	1	2.94	1.76	na	1–7	Last year, that is in 2013, what was your total family income from all sources, before taxes?
Education level	1	4.78	1.91	na	1–8	What is the highest level of school you have completed or the highest degree you have received?
Opposing construction of the Keystone XL pipeline	1	2.25	1.03	na	1–4	Do you oppose building the Keystone XL pipeline that would transport oil from Canada's oil sands region through the Midwest to refineries in Texas?
Supporting funding for renewable energy	1	2.79	1.03	na	1–4	Do you favor increasing federal funding for research on renewable energy such as wind, solar and hydrogen, even if it raises taxes?
Stricter limits on the amount of carbon dioxide	1	2.70	1.00	na	1–4	Do you favor stricter limits on the amount of carbon dioxide that power plants and other industrial facilities can release, even if it raises the prices of goods and services?
Fossil fuel companies should pay more taxes	1	2.48	0.99	na	1–4	Do you favor requiring companies that produce fossil fuels, such as coal, oil and natural gas to pay a tax even if it raises the cost of electricity?
Opposing the use of fracking	1	2.58	0.99	na	1–4	Do you oppose increased use of fracking, a drilling method that uses high-pressure water and chemicals to extract oil and natural gas from underground rock formations?
Support stricter limits on the amount of carbon dioxide that vehicles produce	1	2.77	0.99	na	1–4	Do you favor stricter limits on the amount of carbon dioxide that vehicles produce, even if it raises the price of cars?
Global warming will hurt people	3	2.81	0.95	0.85	1–4	Would you say global warming will cause People in the United States a great deal of harm, a moderate amount, only a little or none at all?
Protecting the environment as a personal value	3	4.20	0.70	0.74	1–5	Protecting the environment for the sake of… preventing human suffering and harm, protecting other species, taking care of the earth
Experiences of awe	4	3.87	0.82	0.72	1–4	How often do you Feel a deep sense of wonder about the universe?
Government efforts to address climate change	3	2.79	0.97	0.79	1–4	The U.S. government needs to do more to address the issue of climate change.
Global warming deserves more attention	1	2.52	1.07	na	1–4	The issue of global warming is getting more attention than it deserves. (reversed)
Climate change is a crisis	1	3.61	1.02	na	1–5	Would you say that climate change is best described as a crisis, a major problem but not a crisis, a minor problem, or is it not a problem at all?
Climate change creates environmental problems (version 1)	3	0.75	1.16	0.87	0–3	Do you believe that climate change is a major factor, a minor factor or not a factor responsible for causing: e.g., more extreme storms and hurricanes?
Climate change creates environmental problems (version 2)	3	0.68	1.05	0.79	0–3	Do you believe that climate change is a major factor, a minor factor or not a factor responsible for causing: e.g., conflicts and wars over scarce resources?
Climate change requires personal sacrifices	1	0.62	0.49	na	dich. (0–1)	To reduce the effects of climate change will we have to make major sacrifices or can technology solve the problem without requiring major sacrifices
Scientists agree that climate change is caused by humans	1	0.46	0.50	na	dich. (0–1)	Do scientists generally agree that the earth is getting warmer because of human activity?
Climate change is caused by humans	1	0.44	0.50	na	dich. (0–1)	Climate change is caused mostly by human activity such as burning fossil fuels
The earth's temperature is getting warmer	1	0.66	0.47	na	dich. (0–1)	Do you believe there is solid evidence that the average temperature on earth has been getting warmer over the past few decades, or not?

highlighting a positive association between perceived responsibility towards future others and pro-environmental attitudes in a larger and more representative sample of the US population relative to past work (masked for review; Watkins & Goodwin, 2019). Second, we provide evidence for this association among several different facets of pro-environmental attitudes (e.g., personal values, attitudes towards climate change, support/opposition to environmental policies). Third, we control for several key predictors of environmental attitudes and show that the association between perceived responsibility for future others and proenvironmental attitudes is robust to these controls. Finally, we show that perceived responsibility for future generations is relatively independent of key factors known from previous work to correlate negatively with environmental engagement, highlighting the potential importance of this construct in promoting diverse support for proenvironmental policies and actions. However, it is also important to acknowledge a key limitation of the current investigation, namely, the lack of any objective measure of intergenerational discounting. Because we utilized publicly available data, we were limited to the measures that were included in the original data collection. Thus, although we find evidence for a consistent positive association between perceived responsibility for future generations and pro-environmental attitudes, we cannot confidently conclude that the same association is true for intergenerational discounting (i.e., having to make tradeoffs of costs/benefits between the present and future generations).

4. Conclusion

Many environmental challenges require present generations to take costly action on behalf of future generations. Yet such intergenerational prosociality faces significant challenges, including people's tendency to discount future benefits of action relative to costs incurred sooner in time. The current results reveal a potential avenue to potentially help reduce such intertemporal discounting and promote intergenerational environmental concern, namely, perceptions of responsibility towards future generations. Such perceptions of responsibility are widely shared within American society and predictive of proenvironmental engagement regardless of political, religious and demographic identities. These results suggest that instilling a stronger sense of responsibility towards future generations could positively impact people's willingness to take costly action to protect future generations from environmental harms.

Table 2
Linear and bivariate correlations and unstandardized weights for the different environmental outcomes regressed on perceived responsibility for future generations while controlling for political conservatism, importance of religion, consumption of news, race, gender, age, family income, and education level.

Outcome measure	Perceived responsibility for future generations				Political Conservatism			Importance of Religion		
	R	*b*	*SE*	95% CI	*b*	*SE*	95% CI	*b*	*SE*	95% CI
Opposing construction of the Keystone XL pipeline	.17***	0.14***	0.04	.07, .22	−0.38***	0.03	-.44, −.32	−0.04	0.03	-.10, .02
Supporting funding for renewable energy	.21***	0.26***	0.04	.19, .33	−0.22***	0.03	-.27, −.16	−0.14***	0.03	-.20, −.08
Supporting stricter limits on the amount of carbon dioxide	.23***	0.28***	0.04	.21, .35	−0.19***	0.03	-.25, −.14	−0.14***	0.03	-.20, −.08
Requiring companies that produce fossil fuels to pay taxes even if it increases electricity costs	.16***	0.17***	0.04	.10, .24	0.17***	0.04	-.23, −.12	−0.10***	0.03	-.16, −.04
Opposing the use of fracking as a drilling method	.13***	0.14***	0.04	.06, .21	−0.19***	0.03	-.24, −.13	−0.09**	0.03	-.15, −.03
Support stricter limits on the amount of carbon dioxide that vehicles produce	.19***	0.21***	0.04	.14, .28	−0.22***	0.03	-.27, −.16	−0.04	0.03	-.10, .02
Protecting the environment as a personal value	.65***	0.55***	0.01	.53, .58	−0.07***	0.01	-.09, −.04	0.01	0.01	-.01, .04
Experience of awe	.20***	0.17***	0.02	.14, .21	<.01	0.02	-.03, .03	0.14***	0.02	.10, .17
Global warming will hurt people	.28***	0.28***	0.02	.24, .33	−0.24***	0.02	-.28, −.21	−0.04*	0.02	-.08, −.01
Government efforts to address climate change	.28***	0.30***	0.02	.25, .34	−0.28***	0.02	-.32, −.25	−0.11***	0.02	-.14, −.07
Climate change creates environmental problems (version 1)	.11***	0.12***	0.03	.06, .18	−0.17***	0.02	-.22, −.12	−0.05*	0.03	-.10, −.01
Climate change creates environmental problems (version 2)	.12***	0.15***	0.03	.09, .20	−0.13***	0.02	-.17, −.08	0.01	0.02	-.03, .06
Climate change is a crisis	.25***	0.25***	0.02	.20, .30	−0.28***	0.02	-.32, .24	−0.10***	0.02	-.14, −.06
Global warming deserves more attention as an issue	.18***	0.22***	0.04	.14, .29	−0.28***	0.03	-.34, −.22	−0.16***	0.03	-.22, −.10
Climate change requires personal sacrifices†	.15***	0.41***	0.06	.59, .75	−0.28***	0.05	1.20, 1.46	0.01	0.05	0.89, 1.10
Scientists agree that climate change is caused by humans†	.11***	0.19***	0.06	.74, .92	−0.48***	0.05	1.48, 1.78	−0.12**	0.05	1.03, 1.23
Climate change is caused by humans†	.17***	0.44***	0.06	.57, .73	−0.65***	0.05	1.75, 2.13	−0.24***	0.05	1.16, 1.41
There is solid evidence that the earth's temperature is getting warmer†	.15***	0.36***	0.06	.62, .78	−0.63***	0.05	1.69, 2.08	−0.16**	0.05	1.05, 1.30

Note: Given that the responses were not given to all measures equally, the *N* for each regression model is different. Results for age, family income education level, consumption of news, race and gender are presented in the Supplementary Materials. † Variable was dichotomous and thus biserial correlations and logistic regressions were computed. For these variable, 95% Wald Confidence Limits are reported; * $p < .05$, ** $p < .01$, *** $p < .001$.

Author statement

Stylianos Syropoulos: Conceptualization, Methodology, Software, Validation, Formal analysis, Visualization, Writing – Original Draft, Writing – Review & Editing, Visualization, **Ezra Markowitz:** Conceptualization, Writing – Review & Editing, Supervision.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jenvp.2021.101651.

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