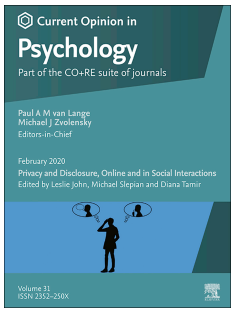
Journal Pre-proof



Ethics, Morality, and the Psychology of Climate Justice

Adam R. Pearson, Corinne G. Tsai, Susan Clayton

PII: S2352-250X(21)00027-0

DOI: https://doi.org/10.1016/j.copsyc.2021.03.001

Reference: COPSYC 1136

To appear in: *Current Opinion in Psychology*

Received Date: 9 December 2020

Revised Date: 26 February 2021

Accepted Date: 3 March 2021

Please cite this article as: Pearson AR, Tsai CG, Clayton S, Ethics, Morality, and the Psychology of Climate Justice, *Current Opinion in Psychology*, https://doi.org/10.1016/j.copsyc.2021.03.001.

Ethics, Morality, and the Psychology of Climate Justice

Adam R. Pearson[1], Corinne G. Tsai[2], and Susan Clayton[3]

1 Department of Psychological Science, Pomona College, Claremont, CA, USA

2 Department of Psychology, University of Cambridge, Cambridge, UK

3 Department of Psychology, College of Wooster, Wooster, OH, USA

Corresponding author:

Adam R. Pearson (adam.pearson@pomona.edu)

Declaration of interest: none

Abstract

Climate change is increasingly understood as a social justice issue by academics, policymakers, and the public, however, the nature of these perceptions, and their implications for cooperation and decision making, have only recently begun to receive empirical attention. We review emerging empirical work that suggests that morality and justice perceptions can serve as both a bridge and a barrier to cooperation around climate change, and highlight two critical areas for future development, identifying psychological processes that promote and impede climate vulnerability and enhance equity in the design and implementation of climate solutions. We argue that conceptualizing climate justice as a multidimensional process addressing both social and structural barriers can stimulate new psychological research and help align disparate approaches within the social sciences.

Keywords: Morality, climate justice, social psychology, procedural justice, distributive justice, climate adaptation

Ethics, Morality, and the Psychology of Climate Justice

In 2019, one of the strongest Atlantic hurricanes ever recorded struck the Bahamas, devastating communities throughout the island nation, and particularly poor neighborhoods populated by Haitian migrants, many of whom had fled the devastation of a 2010 earthquake in their home country. Hurricane Dorian struck two weeks before the largest grassroots protests in history – a youth-led movement fueled by demands for climate action, justice, and accountability to protect and preserve the planet for future generations. The climate protests of 2019 occurred in the wake of the Yellow Vest demonstrations in France, an unprecedented response to a fuel consumption tax to curb greenhouse gas emissions that sparked a national movement for economic justice.

These events highlight a few of the many ethical challenges climate change poses that are increasingly the focus of policymaking and public engagement [1]. Indeed, as of 2020, half of Americans now perceive climate change as a moral issue (vs. 38% in 2019), and over two-thirds of Americans indicate that climate change will harm the world's poor (67%), future generations (73%), and other species (73%) [2]. Similar trends have been documented in other countries, with majorities in France, the United Kingdom, Norway, and Germany viewing climate change as a moral issue, which is generally a stronger predictor of climate mitigation and adaptation policy support in these nations than perceptions that climate change will have negative effects on their home country [3].

Social scientists, humanists, and philosophers have identified a variety of ethical dimensions of climate change, as well as several unique features of the problem that may hinder our ability to respond ethically and cooperatively. Gardiner [4], for instance, characterizes the ethical dilemma of climate change as one shaped by the dispersion of causes and effects,

fragmentation and diffusion of responsibility, and the inadequacy of existing institutions and lack of an effective system of global governance. These elements together, create a "perfect moral storm" that fuels uncertainty and impedes collective action. In this review, we take stock of a growing body of research that explores people's moral intuitions about climate change and the role of fairness judgments in climate-related decision making and consider the implications of this work for advancing the psychological study of climate justice.

1. How and When is Climate Change Perceived as a Moral Issue?

A variety of factors can reduce recognition of the ethical and moral dimensions of climate change. Jamieson [5] describes a prototypical moral problem as one in which an identifiable perpetrator willfully harms an identifiable victim in close temporal and physical proximity. Because climate change does not fit within this typical mold, it may fail to evoke moral concerns that often prompt action [6,7]. Belief in natural (vs. human) causes, uncertainty about its causes and effects, low felt temporal or spatial proximity, and feelings of low efficacy or responsibility can similarly blunt moral intuitions about climate change and collective responses to it [8,9].

One route by which climate change may become moralized is through 'moral piggybacking'– the process of linking an issue to existing moral principles [10]. For instance, in a series of experiments, climate skeptics indicated stronger pro-environmental intentions when they thought addressing climate action would create a society where people are more compassionate [11]. Ideological convictions can also impact the moralization of climate beliefs. Feinberg and Willer [12] found that, compared to conservatives, liberals were more likely to view environmental issues in terms of moral principles of harm/care, which environmental organizations overwhelmingly use in persuasive messaging [8]. Policies that emphasize reducing inequality and protecting vulnerable populations may also be viewed as socially or politically

liberal, and thus may appeal more to those on the political left [13–15]. In contrast, "binding" moral appeals (to authority, purity, and loyalty) have been shown to bolster pro-climate beliefs and activism among conservatives, especially when such appeals stem from an ingroup source [16–18].

2. Climate as a Context for Justice

Philosophical perspectives suggest that many moral disagreements about what is fair revolve around three sometimes conflicting motives – maximizing welfare and prosperity, respecting autonomy, and affirming such shared virtues as collective sacrifice for a common good, sanctioning greed, or protecting the vulnerable. Each of these motives may be evoked by climate change and efforts to address it [19]. Due to reduced agricultural and economic productivity at warmer latitudes, climate change has decreased the wealth of the world's poorest and lowest-emitting nations by 25% since 1961 [20]. Its effects fall disproportionately on those who are least responsible for causing it. Within nations, women, racial and ethnic minorities, lower-income people, indigenous groups, and other vulnerable communities face a "double jeopardy" of both elevated exposure to climate hazards as well as lower capacity to adapt to that exposure [21,22][1].

Climate change can also interact with existing social and economic forces to fuel inequality. Analyzing over two decades of survey and demographic data, Carrico and colleagues [23] found that heat waves and drought lead families in Bangladesh to hasten the marriage of daughters and accept less desirable marriage proposals. Moreover, those who married during periods of drought married men with less education and who were more supportive of intimate partner violence. At the same time, climate adaptation and mitigation efforts can be viewed by some as threatening individual autonomy and prosperity. Consistent with this notion,

individualism and free-market beliefs have been found to be robust predictors of climate skepticism and policy opposition, and particularly of government regulations [24].

The diffuse spatial and temporal features of climate change also pose unique challenges for equitable decision-making. Disproportionate harms to future generations and other species evoke questions of intergenerational and ecological justice [14,25]. Inequities can also emerge in access to the benefits afforded by climate adaptation and mitigation. For instance, within the US, federal assistance to escape flooding and other climate-related disasters is more readily available to wealthy communities [26]. Similarly, policies designed to curb energy use, such as charging higher rates during peak demand, put disproportionate financial pressure on the elderly and disabled, who experience worse health outcomes as a consequence [27][2]. Thus, inequities can stem from the burdens of climate change, as well as from efforts to address it.

2.1 Antecedents of Climate Justice Perceptions

When determining whether a policy is fair, people often evaluate the outcome distribution[3]. Generally, people show aversion to inequitable distributions even when they are personally advantageous, and similar *inequity aversion* has been documented in climate policy preferences [28]. Moreover, in experiments examining Americans' support for climate mitigation policies, policy bundles that include measures designed to reduce inequality, such as increasing access to affordable housing or raising the minimum wage, draw greater bipartisan support than those that lack such reforms [29]. Nevertheless, intergroup biases can also shape perceptions of what outcome distribution is fair. For instance, in survey experiments, US and Chinese residents judged climate mitigation proposals that benefited their own country economically as more fair; however, merely labeling the parties "Country A" and "Country B" eliminated this bias [30].

Concerns about procedural fairness can also impact public support for climate action. Process fairness (e.g., respect and inclusion in decision making) signals that a group's perspective is valued. A review of studies in 15 nations found that both distributive and procedural fairness judgments predicted public support for carbon pricing measures, such as a carbon tax [31]. Moreover, people were more willing to accept these policies when they felt that they had adequate information about how revenues would be used and trusted those in charge of implementing them.

2.2 Consequences of Justice Perceptions for Cooperation and Decision Making

Behaviors that are deemed to have moral relevance are prescriptive, and moral emotions can serve to reinforce appropriate behaviors. Anger and gratitude result from the (im)moral behavior of others, while shame and guilt or pride are targeted toward one's own behaviors. In one study, a predisposition toward the moral emotion of gratitude was associated with a feeling of responsibility for future generations, which predicted pro-environmental policy support [32]. People also associate "green" behavior with positive emotions, suggesting self-approval for making a moral choice [33]. Pro-environmental behavior may sometimes result from virtue signaling, with people striving to indicate their moral worth to others through behaviors that express their pro-environmental values [34].

Morality and fairness judgments may also motivate collective action to address climate change. The social identity model of collective action [35] posits that moral beliefs (values, rights, and convictions) and identification with groups engaged with a social cause spur collective action through two primary routes: collective anger stemming from perceived injustice and efficacy beliefs. Longitudinal studies suggest that perceived injustice may play a stronger role than efficacy beliefs in galvanizing collective action among both advantaged and

disadvantaged groups [36]. Similarly, ratings of the fairness of climate policies have been found to be a stronger determinant of policy support than their perceived effectiveness [37]. Moral emotions such as collective guilt, an emotion that denotes felt responsibility, may also motivate collective action to address climate change. Rees and Bamberg [38], for instance, found that collective guilt and perceptions of collective efficacy enhanced motivations to join a neighborhood climate initiative.

Nevertheless, barriers to cooperation and resistance to climate policies may also emerge from how advantaged and disadvantaged groups perceive and respond to climate-related inequities. Advantaged groups are typically less supportive of environmental regulations, which may be viewed as threatening advantageous systems [14,39]. Existing levels of inequality and motivations to maintain social hierarchies can also interact to bolster resistance to climate policies. In a 25-nation study, those showing a stronger preference for group hierarchies and inequality were less likely to engage in pro-environmental civic actions and to donate to an environmental charity, and this relationship was stronger in nations with greater economic inequality [40]. Similar effects have been documented among climate negotiators: Although they report valuing equity generally, those in wealthier and higher per-capita emissions nations typically favor equity less in negotiations [41].

Cooperative barriers can also emerge from perceptions of disadvantage. Conspicuous inequality – a hallmark of rising global consumption patterns – can reduce cooperation by triggering social comparisons. In networked public goods games in which subjects gain or lose wealth, greater wealth visibility leads to lower levels of cooperation, greater inequality, and lower overall wealth accrual [42]. Inequality can also reduce communication needed for cooperation, thereby undermining trust and making collective action more difficult [43]. Threats

to health and safety evoked by climate change may further stifle collective action by inducing a scarcity mindset. Optimism about the future is one of the strongest predictors of adherence to prosocial norms in cross-national surveys, and awareness of the personal threat that climate change poses may weaken cooperation [44]. In one study, reading about climate-related threats to personal health or food security increased Americans' support for government action to mitigate climate change but decreased their personal willingness to invest time and resources on climate advocacy, compared to a control group [45].

Tendencies to discount future versus present harms (*temporal discounting*) and harms to those more socially distant (*social discounting*) can also reduce equity in resource allocation decisions [46]. Using a climate change public goods game, Hurlstone et al. [47] found that cooperation declined substantially when benefits accrued for future (vs. present) generations. However, activating people's drive to leave a positive legacy (e.g., by reminding participants about the prosocial acts of past generations) reduced intergenerational discounting and enhanced cooperation.

3. New Developments in the Psychological Study of Climate Justice

Social science perspectives within sociology, anthropology, and demography, increasingly conceptualize climate justice as a dynamic, multidimensional process that addresses social relations, such as power and status hierarchies, as well as structural conditions that fuel inequality between groups [48][4]. Complementing this approach is a growing focus among scholars and policymakers on justice at a more local level, addressing social drivers of vulnerability within nations (e.g., "just adaptation" [22,48,49]), as well as inequality in the opportunities afforded by climate adaptation and mitigation (e.g., "just transition" perspectives [50]). Psychological research in these areas can inform efforts to promote public understanding

of climate inequities and their causes and remedies, as well as help to align often disparate approaches within the social and behavioral sciences [51].

For instance, cross-national surveys show that people in both wealthier and poorer nations perceive a fundamental tradeoff between addressing environmental issues and reducing poverty and inequality [52]. However, perceptions of this tradeoff also vary across advantaged and disadvantaged groups within nations. Within the US, for example, racial and ethnic minority and lower-income Americans show greater awareness of social factors that exacerbate environmental harm, such as poverty and racism, than Whites and more affluent Americans [53]. These differing understandings of the social drivers of vulnerability may help to explain, in part, why climate policies that seek to reduce inequities may not resonate equally across groups [1,15,37]. At the same time, recognition of climate risks may not always promote climate resilient behavior, even among highly vulnerable populations. For instance, although smallholder farmers in Kenya show strong awareness of the threat that climate change poses to their livelihood, climate concern is a relatively weak predictor of their adoption of climate adaptation strategies. In contrast, concerns about food and financial security have been shown to be stronger predictors of climate resilient behavior [54]. Understanding what factors motivate people to adopt practices that will prepare them for climate change thus remains a critical avenue for future research.

Social psychological and structural barriers may also impede the access of disadvantaged groups to policymaking and oversight. Although people of color are disproportionately affected by climate change, and have a disproportionate stake in climate solutions, they have traditionally been excluded from decision making that might reduce these inequities [55–57]. One set of processes that may contribute these disparities are stereotypes about which groups are concerned

about the environment. Despite indicating high levels of concern about climate change in national surveys, minority and low-income Americans are misperceived as less concerned than Whites and more affluent Americans by a large segment of the US public [58]. Such misperceptions may lessen support for diversity and outreach initiatives to the extent policymakers and practitioners hold these views. Segregation and systemic racism can also fuel biases in decision making that further exacerbate inequities in environmental harm [59]. For instance, in survey experiments, White Americans judged identical Black (vs. White) neighborhoods as more "blighted" and industrial, and consequently, indicated less opposition to siting a new industrial facility near a Black relative to a White neighborhood in mock urban planning scenarios [60]. Whether similar processes might undermine equity in climate adaptation planning remains a critical question for future research.

People may also avoid taking corrective actions to reduce climate vulnerability, in part, due to an aversion to considering how environmental harms are distributed. In experiments, people were more willing to make monetary contributions to ensure equality when allocating environmental benefits (e.g., deciding where to site pollution-reducing technologies) versus harms (e.g., deciding where to site a new polluting facility) [61]. Although preliminary, these findings suggest that people may be more receptive to initiatives that emphasize equity in benefits (e.g., access to clean energy) than those that seek to reduce inequities in harms.

Compared to research on the assessment and communication of climate risks, insights about *how* to improve climate risk management decisions remain scant [62]. Structured decision making may help groups identify and balance key trade-offs between often conflicting economic, social, and environmental objectives. These approaches may help to organize the decision-making process so that informed dialogue can occur between policymakers and stakeholders,

including vulnerable and frontline communities, which may lead to more effective, inclusive, and equitable policies.

4. Conclusion

Understanding how different segments of the public perceive climate-related inequities and their causes is paramount, as such perceptions can impact public support for regional and national climate policies, as well as guide the priorities of policymakers [28,29,31]. Psychological research that illuminates when and why people fail to see climate inequities or may resist efforts to address them can inform efforts to promote public understanding of climate injustice, as well as help advance more integrative cross-disciplinary approaches to climate justice within the sciences.

References

1*. Gustafson A, Rosenthal SA, Ballew MT, Goldberg MH, Bergquist P, Kotcher JE, Maibach EW, Leiserowitz A: **The development of partisan polarization over the Green New Deal**. *Nat Clim Chang* 2019, **9**:940–944.

The authors explore the polarization of the Green New Deal over time by examining familiarity with and support for it during a four month period in which it rose to national attention. They show that what began as a less well-known and widely supported policy eventually became a polarized issue as support from Republicans rapidly declined.

2. Leiserowitz A, Maibach E, Rosenthal S, Kotcher J, Bergquist P, Ballew M, Goldberg M, Gustafson A, Wang X: *Climate Change in the American Mind: April 2020*. Yale University and George Mason University; 2020.

3. Doran R, Böhm G, Pfister H-R, Steentjes K, Pidgeon N: **Consequence evaluations and moral concerns about climate change: Insights from nationally representative surveys across four European countries**. *J Risk Res* 2019, **22**:610–626.

4. Gardiner SM: **A Perfect Moral Storm: Climate Change, Intergenerational Ethics and the Problem of Moral Corruption**. *Environ Values* 2006, **15**:397–413.

5. Jamieson D: **Climate Change, Responsibility, and Justice**. *Sci Eng Ethics* 2010, **16**:431–445.

6. Ferguson MA, Branscombe NR: **Collective guilt mediates the effect of beliefs about global warming on willingness to engage in mitigation behavior**. *J Environ Psychol* 2010, **30**:135–142.

7. Harth NS, Leach CW, Kessler T: **Guilt, anger, and pride about in-group environmental behaviour: Different emotions predict distinct intentions**. *J Environ Psychol* 2013,

34:18–26.

8. Markowitz EM, Shariff AF: **Climate change and moral judgement**. *Nat Clim Chang* 2012, **2**:243–247.

9**. Swim JK, Bloodhart B: **The intergroup foundations of climate change justice**. *Gr Process Intergr Relations* 2018, **21**:472–496.

The authors provide a novel perspective on climate change as an intergroup relations dilemma with justice implications. They discuss who is resonsible for and vulnerable to its effects, social psychological processes driving minimization of injustice, and how a lack of connection to disadvantaged groups drives minimization. They conclude with a discussion of potential solutions for addressing the minimzation of climate injustice.

10. Feinberg M, Willer R, Kovacheff C: **The activist's dilemma: Extreme protest actions reduce popular support for social movements.** *J Pers Soc Psychol* 2020, **119**:1086–1111.

11. Bain PG, Hornsey MJ, Bongiorno R, Jeffries C: **Promoting pro-environmental action in climate change deniers**. *Nat Clim Chang* 2012, **2**:600–603.

12. Feinberg M, Willer R: **The moral roots of environmental attitudes.** *Psychol Sci* 2013, **24**:56–62.

13. Clayton S, Koehn A, Grover E: **Making Sense of the Senseless: Identity, Justice, and the Framing of Environmental Crises**. *Soc Justice Res* 2013, **26**:301–319.

14. Clayton S, Kals E, Feygina I: **Justice and Environmental Sustainability**. In *Handbook of Social Justice Theory and Research*. Edited by Sabbagh C, Schmitt M. Springer New York; 2016:369–386.

15. Whitmarsh L, Corner A: **Tools for a new climate conversation: A mixed-methods study**

of language for public engagement across the political spectrum. *Glob Environ Chang* 2017, **42**:122–135.

16. Wolsko C, Ariceaga H, Seiden J: **Red, white, and blue enough to be green: Effects of moral framing on climate change attitudes and conservation behaviors**. *J Exp Soc Psychol* 2016, **65**:7–19.

17. Wolsko C: **Expanding the range of environmental values: Political orientation, moral foundations, and the common ingroup**. *J Environ Psychol* 2017, **51**:284–294.

18*. Hurst K, Stern MJ: **Messaging for environmental action: The role of moral framing and message source**. *J Environ Psychol* 2020, **68**:101394.

This article examines how the moral framing and the source of environmental messages influences the responses of liberals and conservatives. Messages with conservative moral appeals and a conservative message source were particularly effective among conservatives. Moreover, these messages did not alienate liberals, implying that such messaging may be better than many conventional communications for engaging both parties.

19. Sandel MJ: *Justice: What's the right thing to do?* Macmillan; 2010.

20*. Diffenbaugh NS, Burke M: **Global warming has increased global economic inequality**. *Proc Natl Acad Sci* 2019, **116**:9808–9813.

The authors provide evidence that global warming has already worsened economic inequality. Wealthier countries have experienced economic growth while poorer countries have experienced declines. Results indicate that transitioning to low-carbon fuel sources could not only offer poorer countries the main benefit of greater energy availability but also the secondary benefits of preventing further economic downturn caused by warming.

21. Morello-Frosch R, Shenassa ED: **The Environmental "Riskscape" and Social Inequality: Implicationsfor Explaining Maternal and Child Health Disparities**. *Environ Health Perspect* 2006, **114**:1150–1153.

22**. Thomas K, Hardy RD, Lazrus H, Mendez M, Orlove B, Rivera-Collazo I, Roberts JT, Rockman M, Warner BP, Winthrop R: **Explaining differential vulnerability to climate change: A social science review**. *Wiley Interdiscip Rev Clim Chang* 2019, **10**:e565.
In this qualitative review, the authors explore social determinants of climate vulnerability. Using an interdisciplinary social science framework, they evaluate the social components of vulnerability through four major themes: resource access, governance, culture, and knowledge. Their approach uncovers the reasons why disparities in vulnerability exist and various strategies to minimize it.

23*. Carrico AR, Donato KM, Best KB, Gilligan J: **Extreme weather and marriage among girls and women in Bangladesh**. *Glob Environ Chang* 2020, **65**:102160.
Survey and demographic data from 615 Bangladeshi households from 1989 to 2013 reveal that in the aftermath of a heat wave, girls and women are more likely to marry, and to do so with men from poorer households and who have less education. The authors suggest that many families agree to less desirable marriage proposals and expedite the marriage of their daughters in response to extreme climate impacts.

24. Ballew MT, Pearson AR, Goldberg MH, Rosenthal SA, Leiserowitz A: **Does socioeconomic status moderate the political divide on climate change? The roles of education, income, and individualism**. *Glob Environ Chang* 2020, **60**:102024.

25. Opotow S, Clayton S: **Green justice: Conceptions of fairness and the natural world**. *J Soc Issues* 1994, **50**:1–11.

26. Mach KJ, Kraan CM, Hino M, Siders AR, Johnston EM, Field CB: **Managed retreat through voluntary buyouts of flood-prone properties**. *Sci Adv* 2019, **5**:eaax8995.

27*. White L V., Sintov ND: **Health and financial impacts of demand-side response measures differ across sociodemographic groups**. *Nat Energy* 2020, **5**:50–60.

The authors show that demand side response (DSR) measures disproportionately affect the health and finances of vulnerable groups, with higher energy bills for elderly and disabled residents and worse health impacts for ethnic minorities and people with disabilities. The authors suggest that DSR design should carefully consider vulnerable groups and the injustices these groups face.

28*. Svenningsen LS: **Social preferences for distributive outcomes of climate policy**. *Clim Change* 2019, **157**:319–336.

A study that shows that distributive outcomes inform monetary decisions to support climate policy. In an online choice experiment using a real donation mechanism, inequity aversion and general altruism both impacted policy preferences. Implications are that understanding preferences for distributive outcomes can help determine the appropriate level for carbon taxation and create messaging about climate policies that build support.

29**. Bergquist P, Mildenberger M, Stokes LC: **Combining climate, economic, and social policy builds public support for climate action in the US**. *Environ Res Lett* 2020, **15**:054019.

Through conjoint survey experiments, the authors show that connecting climate policy to other economic and social policies (e.g., affordable housing) increases public support for climate action, especially among people of color. Additionally, they find that clean eletricity standards increase support for climate policy bundles. Bundling policies may be

an effective strategy for expanding climate coalitions.

30. Kriss PH, Loewenstein G, Wang X, Weber RA: **Behind the veil of ignorance: Self-serving bias in climate change negotiations**. *Judgm Decis Mak* 2011, **6**:602–615.

31*. Maestre-Andrés S, Drews S, van den Bergh J: **Perceived fairness and public acceptability of carbon pricing: A review of the literature**. *Clim Policy* 2019, **19**:1186–1204.

A comprehensive qualitative review of research on people's perceptions of the fairness of carbon pricing, including their views on personal, distributional, and procedural aspects, and how such perceptions drive policy acceptance. Findings suggest that people are concerned about distributional impacts of carbon pricing policies on poorer households and have a lack of trust in governmental oversight and use of revenue. Policy recommendations for expanding acceptance of carbon pricing are provided.

32*. Syropoulos S, Watkins HM, Shariff AF, Hodges SD, Markowitz EM: **The role of gratitude in motivating intergenerational environmental stewardship**. *J Environ Psychol* 2020, **72**:101517.

Four studies show that gratitude, but not feelings of indebtedness, predicts feelings of responsibility to future generations. This feeling of intergenerational responsibility consequently predicts greater concern about climate change, pro-environmental intentions, and policy support. The authors argue that environmental interventions aiming to overcome temporal discounting may be more persuasive by employing gratitude-based frames.

33. Venhoeven LA, Bolderdijk JW, Steg L: **Why going green feels good**. *J Environ Psychol* 2020, **71**:101492.

34*. Vesely S, Klöckner CA, Brick C: **Pro-environmental behavior as a signal of cooperativeness: Evidence from a social dilemma experiment**. *J Environ Psychol* 2020, **67**:101362.

The authors investigate how pro-environmental behavior may signal cooperativeness. People who act pro-environmentally are expected to be more cooperative, favored as interaction partners, and receive higher levels of cooperation from others. Although pro-environmental people reap these personal benefits, they are not any more cooperative than less pro-environmental people.

35. van Zomeren M, Kutlaca M, Turner-Zwinkels F: **Integrating who "we" are with what "we" (Will not) stand for: A further extension of the social identity model of collective action**. *Eur Rev Soc Psychol* 2018, **29**:122–160.

36. Thomas EF, Zubielevitch E, Sibley CG, Osborne D: **Testing the social identity model of collective action longitudinally and across structurally disadvantaged and advantaged groups**. *Personal Soc Psychol Bull* 2020, **46**:823–838.

37*. Clayton S: **The role of perceived justice, political ideology, and individual or collective framing in support for environmental policies**. *Soc Justice Res* 2018, **31**:219–237.

This study investigates the impact of perceived justice on attitudes toward environmental policies varying in type of impact (ecological or societal) and level of focus (individual or collective). Perceptions of the fairness of a given policy and endorsement of environmental justice statements both predicted policy acceptance. Notably, perceived fairness better predicted policy acceptance than perceived effectiveness.

38. Rees JH, Bamberg S: **Climate protection needs societal change: Determinants of intention to participate in collective climate action**. *Eur J Soc Psychol* 2014, **44**:466–

473.

39. Hennes EP, Ruisch BC, Feygina I, Monteiro CA, Jost JT: **Motivated Recall in the Service of the Economic System: The Case of Anthropogenic Climate Change**. *J Exp Psychol Gen* 2016, **145**:755–771.

40**. Milfont TL, Bain PG, Kashima Y, Corral-Verdugo V, Pasquali C, Johansson LO, Guan Y, Gouveia V V., Garðarsdóttir RB, Doron G, et al.: **On the relation between social dominance orientation and environmentalism: A 25-nation study**. *Soc Psychol Personal Sci* 2018, **9**:802–814.

One of the first large-scale, cross-national studies to explore the association between social dominance orientation (SDO) and climate mitigation behavior. The authors find that people higher in SDO are less likely to partake in pro-environmental actions but country-level factors influence this relationship: the relationship is stronger in societies with more inequality, less affluence and lower standard of living, and weaker environmental standards, which may afford more environmental exploitation by those who favor inequality.

41. Lange A, Vogt C, Ziegler A: **On the importance of equity in international climate policy: An empirical analysis**. *Energy Econ* 2007, **29**:545–562.

42. Nishi A, Shirado H, Rand DG, Christakis NA: **Inequality and visibility of wealth in experimental social networks**. *Nature* 2015, **526**:426–429.

43. Tavoni A, Dannenberg A, Kallis G, Löschel A: **Inequality, communication, and the avoidance of disastrous climate change in a public goods game**. *Proc Natl Acad Sci U S A* 2011, **108**:11825–11829.

44. Sheetal A, Feng Z, Savani K: **Using machine learning to generate novel hypotheses:**

Increasing optimism about COVID-19 makes people less willing to justify unethical behaviors. *Psychol Sci* 2020, **31**:1222–1235.

45*. Levine AS, Kline R: **A new approach for evaluating climate change communication**. *Clim Change* 2017, **142**:301–309.

Using a combination of field and survey experiments, exploring responses to two common frames related to cimate change risks, the authors show that climate messages can have divergent effects on attitudes and behavior. They find that messages conveying threats to personal health or food security can heighten people's concern about climate change; yet reduce personal activism.

46. Wade-Benzoni KA: **Legacy motivations & the psychology of intergenerational decisions**. *Curr Opin Psychol* 2019, **26**:19–22.

47**. Hurlstone MJ, Price A, Wang S, Leviston Z, Walker I: **Activating the legacy motive mitigates intergenerational discounting in the climate game**. *Glob Environ Chang* 2020, **60**:102008.

This article investigates intergenerational discounting, or the tendency to fulfill smaller benefits for the present self in lieu of larger benefits for future generations, in a climate change public goods game. Discounting lowered people's cooperation with future generations. However, activating a legacy motive diminished discounting, suggesting that legacy-promoting messaging may be an effective strategy to increase climate action.

48**. Malloy JT, Ashcraft CM: **A framework for implementing socially just climate adaptation**. *Clim Change* 2020, **160**:1–14.

The authors outline three propositions for implementing just climate adaptation. These propositions focus on the need to include vulernable groups as full participants in decision

making, to acknowledge the causes of systemic injustice in adaptation framing, and to evaluate implementation incrementally. They propose a framework for assessing whether just adaptation is occurring.

49. Schlosberg D, Collins LB: **From environmental to climate justice: climate change and the discourse of environmental justice**. *Wiley Interdiscip Rev Clim Chang* 2014, **5**:359–374.

50. Carley S, Konisky DM: **The justice and equity implications of the clean energy transition**. *Nat Energy* 2020, **5**:569–577.

51. Dietz T, Whitley CT: **Environmentalism, norms, and identity**. *Proc Natl Acad Sci* 2018, **115**:12334–12336.

52*. Bain PG, Kroonenberg PM, Johansson LO, Milfont TL, Crimston CR, Kurz T, Bushina E, Calligaro C, Demarque C, Guan Y, et al.: **Public views of the Sustainable Development Goals across countries**. *Nat Sustain* 2019, **2**:819–825.

Through surveys in both economically developed and developing countries, the authors explore lay perceptions of environmental, social, and economic sustainability. They identify a tension in perceptions between environmental and social sustainability and between these two types of sustainability and economic sustainability. Their findings provide insights into how to effectively communicate about different sustainable development goals and address perceived tradeoffs in these goals.

53*. Song H, Lewis NA, Ballew MT, Bravo M, Davydova J, Gao HO, Garcia RJ, Hiltner S, Naiman SM, Pearson AR, et al.: **What counts as an "environmental" issue? Differences in issue conceptualization by race, ethnicity, and socioeconomic status**. *J Environ Psychol* 2020, **68**:101404.

A study that examines whether Americans' lay perceptions of what is considered an "environmental" issue vary as a function of race, ethnicity, and social class. Racial/ethnic minorities and lower-income respondents viewed "human-oriented" issues like poverty and racism as more "environmental" compared to White and higher income respondents and environmental justice perceptions partially accounted for these differences.

54**. Waldman KB, Attari SZ, Gower DB, Giroux SA, Caylor KK, Evans TP: **The salience of climate change in farmer decision-making within smallholder semi-arid agroecosystems**. *Clim Change* 2019, **156**:527–543.

The authors examine climate adaptation strategies among smallholder farmers in Kenya and their motivations for adopting these practices. While almost all of the farmers acknoweldged how climate change may threaten their livelihoods, concerns about food and economic insecurity were stronger predictors of their adoption of such strategies compared to climate concerns. They suggest that climate perceptions may not necessarily drive climate adaptive behavior and that a greater understanding of what other risks motivate climate preparedness is critically needed.

55. Bernard RE, Cooperdock EHG: **No progress on diversity in 40 years**. *Nat Geosci* 2018, **11**:292–295.

56. Pearson AR, Schuldt JP: **Facing the diversity crisis in climate science**. *Nat Clim Chang* 2014, **4**:1039–1042.

57. Pearson AR, Schuldt JP: **A diversity science approach to climate change**. In *Psychology and Climate Change: Human Perceptions, Impacts, and Responses*. Edited by Clayton S, Manning C. Elsevier; 2018:95–124.

58**. Pearson AR, Schuldt JP, Romero-Canyas R, Ballew MT, Larson-Konar D: **Diverse**

segments of the US public underestimate the environmental concerns of minority and low-income Americans. *Proc Natl Acad Sci* 2018, **115**:12429–12434.

In a nationally representative survey experiment, the authors find that groups most vulnerable to climate change, including racial and ethnic minority and lower-income Americans, who indicate high levels of environmental concern, are paradoxically perceived as least concerned by a large segment of the US public. These perceptions were associated with widely shared stereotypes of environmentalists as White, middle class, and highly-educated, and, in an embedded randomized experiment, were sensitive to levels of diversity portrayed in environmental organizational messaging.

59. Schell CJ, Dyson K, Fuentes TL, Roches S Des, Harris NC, Miller DS, Woelfle-Erskine CA, Lambert MR: **The ecological and evolutionary consequences of systemic racism in urban environments**. *Science (80-)* 2020, **369**:eaay4497.

60. Bonam CM, Bergsieker HB, Eberhardt JL, Bonam CM, Bergsieker HB, Eberhardt JL: **Polluting Black Space**. *J Exp Psychol Gen* 2016, **145**:1561–1582.

61**. Makov T, Newman GE, Zauberman G: **Inconsistent allocations of harms versus benefits may exacerbate environmental inequality**. *Proc Natl Acad Sci* 2020, **117**:8820–8824.

Five studies explore people's preferences for the allocation of environmental harms and benefits and reveal that people have lower preferences for increasing equality when allocating harms compared to benefits. The authors argue that this phenomenon may be the result of a tension between the perceived unfairness of the act of imposing harms and the fairness essential to the act of expanding equality. These findings suggest the possibility that environmental justice may be better received if framed in terms of

allocating benefits rather than harms.

62*. Árvai J, Gregory R: **Beyond choice architecture: A building code for structuring climate risk management decisions**. *Behav Public Policy* 2020: 1-20.

Using real-world case studies of energy system transitions and adaptation to sea-level rise, the authors illustrate the value of adopting more deliberative and structured modes of decision making for climate risk management. This type of decision making involves the articulation of objectives, a thoughtful consideration of key trade-offs, deliberations on the alignment between priorities and various risk management options, and structure for the inclusion of stakeholders.

63. McLaren DP: **Whose climate and whose ethics? Conceptions of justice in solar geoengineering modelling**. *Energy Res Soc Sci* 2018, **44**:209–221.

64. Cushing L, Blaustein-Rejto D, Wander M, Pastor M, Sadd J, Zhu A, Morello-Frosch R: **Carbon trading, co-pollutants, and environmental equity: Evidence from California's cap-and-trade program (2011–2015)**. *PLOS Med* 2018, **15**:e1002604-undefined.

Footnotes

[1] For instance, less affluent communities may show greater vulnerability because they lack the resources and/or infrastructure to mobilize resources (i.e., adaptive capacity [22]).

[2] Additional inequities may emerge from technological (e.g., geoengineering [63]) and market-based (e.g., cap-and-trade [64]) approaches to climate mitigation that further burden or fail to benefit disadvantaged communities and poorer nations.

[3] Whereas distributional justice is focused on the distribution of burdens and benefits across groups, procedural justice refers to equitable and inclusive decision-making procedures [14,48,50]. Although other types of justice, such as recognition justice – the acknowledgement of harm or exclusion from decision making – and restorative and retributive justice may also inform fairness judgments, here we focus on distributional and procedural justice, which comprise the bulk of empirical work, to date.

[4] Although inclusive of procedural justice (e.g., processes that enhance the recognition and agency of vulnerable and marginalized communities), conceptualizing justice as a multidimensional process recognizes that justice is a dynamic state shaped by broader social forces that can fuel inequities in both procedures and outcomes [22]. These include social drivers of vulnerability (e.g., racism) that can also impede access to the benefits of climate solutions. Understanding how and when people respond to these and other barriers to justice remain key questions for psychological research.

Ethics, Morality, and the Psychology of Climate Justice

Adam R. Pearson, Corinne G. Tsai, and Susan Clayton

Declaration of interest: none

CRediT authorship contribution statement

Adam Pearson: Conceptualization, Investigation, Writing - original draft, Writing - review & editing. Corinne Tsai: Conceptualization, Investigation, Writing - review & editing. Susan Clayton: Conceptualization, Writing - review & editing.