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Research on climate change in social psychology publications: A systematic review

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There is a strong scientific consensus that anthropogenic climate change is happening and that its impacts can put both ecological and human systems in jeopardy. Social psychology, the scientific study of human behaviours in their social and cultural settings, is an important tool for understanding how humans interpret and respond to climate change. In this article, we offered a systematic review of the social psychological literature of climate change. We sampled 130 studies on climate change or global warming from 80 articles published in journals indexed under the “Psychology, social” category of *Journal Citation Reports*. Based on this sample, we observe that social psychologists have produced an impressive canon of research on this pressing topic, the strengths of which include diversity of research designs, outcome variables, and theoretical angles. However, there are some gaps in this literature, including weak presence of authors and data from non-Western, developing, and nondemocratic societies, lack of cross-cultural comparisons, reliance on young and Amazon MTurk samples, lack of attention to some crucial outcome variables, and overemphasis on intrapersonal and intrapsychic processes. We recommend that future social psychological research on climate change needs to broaden geographical and demographic representation, examine study outcomes other than mitigation behaviour, and adopt more “social” theoretical perspectives. We also offer suggestions as to how these needs can be addressed.

Keywords: climate change, global warming, review, social psychology.

Climate Change and Social Psychology

There is a strong scientific consensus that anthropogenic climate change is happening (Cook et al., 2013). Continued global warming will increase the frequency, pervasiveness, and intensity of extreme events, putting both ecological and human systems in jeopardy (International Panel on Climate Change, 2018). Climate change also entails slower, less dramatic, but highly impactful changes in the underlying climatic conditions such as heat and precipitation, within which our societies are constructed.

These changes in the geophysical climate have significant implications for human social behaviour, and thus for social psychology. One of the principal messages of social psychology has consistently been that external forces are more important influences on individuals than is typically recognised by the layperson. Although psychologists have mostly focused on social aspects of the situation, such as other people and salient social roles and expectations, the physical environment clearly has

the potential for a direct effect on behaviour as well as effects moderated by social constructions of that environment. Additionally, climate change has become part of our social context: Social interactions affect both our perceptions of climate change and are affected by our experiences of climate change (Geiger & Swim, 2016; Whitmarsh & Capstick, 2018).

Although the climate has already changed and will continue to change regardless of future human behaviour, human actions will still determine the degree of warming—ranging from substantial (1.5°C) to catastrophic (as much as 4–5°C if current behaviour remains unchanged; International Panel on Climate Change, 2014). The reduction of carbon emissions and adaptation to climate risks and other greenhouse gases necessitate behavioural changes by actors at all levels (e.g., individual citizens, communities, businesses, governments). Engineers and climate scientists are needed to inform us about the actions that can reduce greenhouse gas emissions, but social science is needed to explain the forces that motivate, or inhibit, such actions on the part of individuals and groups. Businesses and governments may seem like the most important actors, but individuals and their behavioural choices still play a significant role (Nielsen et al., 2020).

Social psychologists’ expertise in understanding the predictors of behaviour, especially the relationship

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between knowledge, attitudes, values, and behaviour, is fundamental to this topic. A great deal of social psychological research has focused on the sources of environmental concern and the factors that can increase the strength of the relationship between concern and pro-environmental behaviour. Social psychologists have also described nonattitudinal variables that affect behaviour, such as social norms (which influence attitudes as well as having a direct effect on behaviour) and incentives (which may backfire by undercutting intrinsic motivation). Understanding climate change is neither necessary nor relevant as a precursor to sustainable behaviour, but it is certainly relevant. Perceptions of climate change, and the risks that it poses, have emerged as an important source of variability in environmental concern and pro-environmental behaviour. Social psychological studies on group identity and polarisation help to understand why political partisanship is an important predictor of accepting the reality of climate change in a number of countries. Research on risk perception has pointed to the importance of temporal orientation and psychological distance in inhibiting attention to, and concern about, the impacts of climate change.

It is too late for societal action to completely mitigate climate change. Because it cannot be avoided, researchers have begun to turn their attention to understanding its impacts and the possibilities for adaptation (Clayton, 2020). Behavioural adaptation might include planning ahead for events like floods or wildfire, for example, by flood-proofing one's house or being ready to evacuate. It could also include planting trees to provide shade in the hot summers, modifying agricultural practices, and even changing the ways in which a person interacts with the natural world (e.g., skiing or fishing). In terms of social psychological processes, decisions about adaptive behaviour are probably similar to decisions about mitigating behaviours, but more research is needed in this area.

Similarly, there is still relatively little research on the potential impacts of climate change on social behaviour and psychosocial wellbeing, although attention to this topic is growing (e.g., Carleton & Hsiang, 2016; Ojala, 2013; J. Wang *et al.*, 2020). Given the well-known influence of heat on aggression (Miles-Novelo & Anderson, 2019), there is every reason to expect that those impacts will be significant: reductions in positive mood, increases in interpersonal hostility and aggression, and decreases in altruism. There may be other influences on interpersonal interaction as well, such as when cultural traditions and practices tie social interactions to the natural environment (MacDonald *et al.*, 2013).

Climate change represents a grave threat to human civilisation, and a significant and ongoing change to the physical and social context we all live in. Social psychology, the scientific study of human behaviour in their

social and cultural settings, is an important tool for understanding and responding to its impacts. How has social psychology been meeting this challenge? In the following, we present a systematic review of social psychological research related to climate change to characterize trends as well as identify possible gaps in the research coverage.

Method

We sampled studies with relevance to climate change or global warming from publications in social psychological journals.¹ This sampling method allowed us to take advantage of the triangulation among the authors, reviewers, and editors. That is, when a climate-change-related study was published in a social psychological journal, we can safely assume that it has social psychological substance, both because the authors chose to submit it to a social psychological journal in the first place and because the reviewers and editors chose to accept it to be published in the journal. This method has been used in other reviews or bibliometric analyses of social psychological publications (Chester & Lasko, 2019; Haslam & Kashima, 2010; Lovakov & Agadullina, 2021).

We acknowledge that there might be studies on the topic of climate change or global warming with social psychological substance that were published in nonsocial psychological journals such as journals in other psychology subfields (e.g., *Journal of Environmental Psychology*) or interdisciplinary journals (e.g., *Nature Climate Change*). Our sample did not include these potentially relevant publications. We will return to this issue in the general discussion.²

We defined social psychological journals as the 63 journals that were indexed under "Psychology, social" category in *Journal Citation Reports 2019*, Web of Science. This definition has been used by other researchers (Haslam & Kashima, 2010; Lovakov & Agadullina, 2021). We performed a search within each journal on

¹Exhaustively reviewing the whole population of relevant publications (i.e., social psychology publications on climate change or global warming) is not feasible, as this population cannot be discretely defined. Intuitively, it appears reasonable to consider all publications with mentions of "climate change" or "global warming" and "social psychology/psychological" as our target population. However, it is very likely that some relevant publications with social psychological substance (e.g., a focus on social norms and mitigation behaviour) may not explicitly mention "social psychology/psychological." For this reason, it is technically not possible to identify every single relevant publication in this unspecified population.

²It should be noted that even if we want to include these publications in our sample, we inevitably will face a difficult situation wherein we need to consider every single potentially relevant article in these nonsocial psychological journals and assess whether it is or is not social psychological. In this situation, we cannot rely anymore on the triangulation among the authors, reviewers, and editors, and we would need to formulate our own judgement. We consider the method we used to be valid and less susceptible to subjectivity biases.

the *PsycInfo* database (on 3 June 2020) using the search term “climate change OR global warming” in the TX field.³ We did the search for all publication years and with no other limits. The searches returned 123 articles in total.

The first author read all 123 articles and identified 80 articles reporting original data analysis with relevance to climate change or global warming. The other 43 articles were excluded from further analysis for either of the following reasons. First, the article did not present any original empirical work. This is the case when the article was an editorial, erratum, commentary, author response, introduction to a special issue, book review, discussion paper, or review paper. Second, the topic of the article was irrelevant to climate change or global warming. In these cases, the term “climate change” or “global warming” was just mentioned in passing.

Among the 80 articles, 150 studies in total were reported (Pilot studies were excluded.) Notably, 20 studies from four of the articles were not related to climate change, global warming, or any environmental issue. These four articles investigated some general social psychological processes, and climate change or global warming was used in only some of the studies as the context wherein these processes took place. Accordingly, we removed these 20 studies.

A research assistant with a master’s degree in psychology then coded each of the remaining 130 studies in terms of its sample size, age of participants, country of origin of participants or data, and sampling method. The first author cross-checked the coding. The first author also identified the main phenomenon of interest and theoretical angle for each article as well as the major research design of each study.

Table 1 lists the details of these 80 articles and 130 studies. For these studies, we have the following observations.

Results

Observations Regarding Research Design

Among the 130 studies, nine studies were qualitative, involving primarily analyses of text (e.g., news reports, debates in parliament, transcripts of interviews, speeches, responses to open-ended survey questions; Caillaud & Flick, 2013; Caillaud et al., 2012; Callaghan & Augoustinos, 2013; Culley et al., 2010; Kurz et al., 2010; Leviston et al., 2014; Sapiains et al., 2016, Study 1; Woods et al., 2018). The other 121 studies were

quantitative. Among these quantitative studies, 61 were experimental or quasi-experimental. The remaining 60 were correlational in nature; four of these correlational studies were longitudinal (Rees et al., 2018, Studies 1–2; Stanley, Wilson, Sibley, and Milfont, 2017, Study 3; Stanley, Wilson, & Milfont, 2017), two presented country-level analyses (McKinney & Fulkerson, 2015; Milfont et al., 2013, Study 2), and one presented multi-level analyses (Liu & Sibley, 2012).

In sum, the quantitative approach is predominant in social psychology publications regarding climate change. Analyses were almost always focused on some sorts of comparison of individuals; comparison at the country level was rare, and multilevel analyses were uncommon. There was almost an equal split in terms of the use of correlational and experimental designs. Longitudinal designs were used in only a handful of studies.

Observations Regarding Authors

We then examined the regional distribution of the authors of the studies. For each of the 80 articles, we coded the country of the corresponding author’s affiliation (or first author when the corresponding author was not identifiable). Information regarding the author’s country of origin was not available and therefore not considered.

Table 2 lists the countries. In all but eight of the 80 articles, the corresponding author was affiliated with an institution from a Western country.⁴ All listed countries, Western or not, are highly developed countries with a high literacy rate and national income; they all have “very high” (≥ 80) Human Development Index scores (United Nations Development Programme, 2020). All of these countries, except Singapore, have a democratic regime, as reflected in their Polity5 scores in 2018 (Marshall & Gurr, 2020). The most dominant country was the United States, associated with over one third (36.25%) of the articles. The other countries associated with at least 5% of the articles include Australia (13.75%), United Kingdom (10.00%), New Zealand (8.75%), Italy (6.25%), and Germany (5.00%).

In sum, the dominance of Western, educated, industrialised, rich, and democratic (WEIRD) countries (Henrich et al., 2010) among the authors of the reviewed studies was remarkable. Such dominance is in line with previous

⁴We use the label “Western” for the convenience in relating our findings to two previous widely cited analyses regarding the geographical representation of behavioural and psychological research (Arnett, 2008; Henrich et al., 2010). Following the definition in these two analyses, we use the word “Western” to refer to countries in Northern and Western Europe and English-speaking countries. Specifically, for Northern and Western Europe, we referred to the geographic region codes of the United Nations Statistics Division (n.d.). For English-speaking countries outside Northern and Western Europe, we referred to the United States, Canada, New Zealand, and Australia.

³According to the APA *PsycInfo* Guide (APA, n.d.), TX refers to “All Text,” meaning that the search engine would automatically search all fields. We believe that a search using TX as the field should be most comprehensive and inclusive.

Table 1
Details of 80 Articles and 130 Studies on Climate Change or Global Warming in Social Psychology Journals

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
Quantitative studies							
<i>Analysis of Social Issues and Public Policy</i>							
Jylhä & Hellmer (2020)	Right-wing populism and climate change denial: The roles of exclusionary and anti-egalitarian preferences, conservative ideology, and antestablishment attitudes	Sweden	2	Study 1: Range = 18–88; $M = 29.3$ Study 2: Range = 18–80; $M = 27.6$	Study 1: Sweden Study 2: Sweden	Study 1: Students from university Study 2: Students from university	Study 1: Correlational Study 2: Correlational
Liu & Sibley (2012)	Hope for the future? Understanding self-sacrifice among young citizens of the world in the face of global warming	New Zealand	1	Range unidentifiable; $M = 22.12$	34 countries [†]	Existing data (the World History Survey, with university students from different countries)	Correlational (multilevel)
Sibley & Kurz (2013)	A model of climate belief profiles: How much does it matter if people question human causation?	New Zealand	1	Range unidentifiable; $M = 47.74$	New Zealand	Existing data (the 2009 New Zealand Attitudes and Values Study, with New Zealanders randomly selected from the 2009 New Zealand electoral roll)	Correlational
<i>Asian Journal of Social Psychology</i>							
M.-F. Chen (2015)	An examination of the value-belief-norm theory model in predicting proenvironmental behaviour in Taiwan	Taiwan	1	Over 20 years; participants aged 60 years and over was the minority (12.42%) whereas those in the 30- to 49-year age group was the majority (42.14%)	Taiwan	National survey, with stratified sampling	Correlational
Leung & Koh (2019)	Understanding pro-environmental intentions by integrating insights from social mobility, cosmopolitanism, and social dominance	Singapore	1	Range unidentifiable; $M = 22.4$	Singapore	Students from university	Correlational
Xue <i>et al.</i> (2016)	Cultural worldviews and climate change: A view from China	Australia	1	Range = 18–75; $M = 37.47$	China	Residents of Beijing recruited through a research agency (Qualtrics)	Correlational
<i>Basic and Applied Social Psychology</i>							
Rees <i>et al.</i> (2018)	Breaking the habit: On the highly habitualized nature of meat consumption and implementation intentions as one effective way of reducing it	Germany	3	Study 1: Range unidentifiable; $M = 26.5$ Study 2: Unidentifiable Study 3: Range unidentifiable; $M = 26.5$	Study 1: Germany Study 2: Germany Study 3: Germany	Study 1: Students from university Study 2: Students from university Study 3: Students from university	Study 1: Correlational (longitudinal) Study 2: Correlational (longitudinal) Study 3: Experimental
<i>British Journal of Social Psychology</i>							

Table 1 (continued)

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
Bury et al. (2020)	Against the odds: Hope as an antecedent of support for climate change action	Australia	2	Study 1: Range unidentifiable; $M = 33.94$ Study 2: Range unidentifiable; $M = 35.65$	Study 1: Australia Study 2: Australia	Study 1: Australian residents recruited through advertisements on social media and community classifieds websites Study 2: Australian citizens (undergraduate students; research agency [SurveyMonkey])	Study 1: Correlational Study 2: Correlational
Sparks et al. (2010)	Pro-environmental actions, climate change, and defensiveness: Do self-affirmations make a difference to people's motives and beliefs about making a difference?	United Kingdom	2	Study 1: Range = 18–28; $M = 20.04$ Study 2: Range = 17–58; $M = 22.76$	Study 1: United Kingdom Study 2: United States	Study 1: Students from university Study 2: University students and others	Study 1: Experimental Study 2: Experimental
<i>European Journal of Social Psychology</i>							
Berlotti & Catellani (2014)	Effects of message framing in policy communication on climate change	Italy	2	Study 1: Range unidentifiable; $M = 24.4$ Study 2: Range unidentifiable; $M = 23.62$	Study 1: Unidentifiable Study 2: Unidentifiable	Study 1: Students from university Study 2: University students and others	Study 1: Experimental Study 2: Experimental
Berlotti & Catellani (2015)	Agreement with climate change policies: Framing the future and national versus supranational identity	Italy	1	Unidentifiable	Italy	Existing data (the ITANES survey, with a representative sample of Italian voters)	Experimental
Cheung et al. (2014)	On attitudes towards humanity and climate change: The effects of humanity esteem and self-transcendence values on environmental concerns	United Kingdom	2	Study 1: Range = 18–75; $M = 36.13$ Study 2: Range = 18–76; $M = 35.71$	Study 1: United States Study 2: United States	Study 1: MTurk Study 2: MTurk	Study 1: Experimental Study 2: Experimental
Guy et al. (2014)	Investigating the effects of knowledge and ideology on climate change beliefs	Australia	1	Range = 18–86; $M = 44$	Australia	Australian public recruited through a research agency	Correlational
Masson & Fritsche (2014)	Adherence to climate change-related ingroup norms: Do dimensions of group identification matter?	Germany	2	Study 1: Range = 18–41; $M = 25.14$ Study 2: Range = 19–35; $M = 24.14$	Study 1: Germany Study 2: Germany	Study 1: Participants from university Study 2: Participants from university	Study 1: Experimental Study 2: Experimental
Panno et al. (2015)	Cognitive reappraisal and proenvironmental behaviour: The role of global climate change perception	Italy	2	Study 1: Range = 19–40; $M = 23$ Study 2: Range = 18–75; $M = 35$	Study 1: Italy Study 2: Italy	Study 1: Students from university Study 2: Public recruited in public areas and main train station	Study 1: Correlational Study 2: Correlational
Rees & Bamberg (2014)	Climate protection needs societal change: Determinants of intention to participate in collective climate action	Germany	1	Range unidentifiable; $M = 31.28$	Germany	Employees and students from university; students' social network	Correlational

Table 1 (continued)

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
van der Linden (2014)	On the relationship between personal experience, affect and risk perception: The case of climate change	United States	1	Range = 18–65, with a modal age bracket of 35–44	United Kingdom	National sample recruited through a research agency, quota sample	Correlational
Walker et al. (2015)	Responses to a worsening environment: Relative deprivation mediates between place attachments and behaviour	Australia	1	<24: 6.9%; 25–34: 18%; 35–44: 16.3%; 45–54: 16.7%; 55–64: 18.1%; 65–74: 18.3%; 75+: 5.8%	Australia	Australian public recruited through an online panel	Correlational
Group process and intergroup relations							
Barth et al. (2018)	Closing ranks: Ingroup norm conformity as a subtle response to threatening climate change	Germany	3	Study 1: Range unidentifiable; $M = 23.08$ Study 2: Range unidentifiable; $M = 23.22$ Study 3: Range unidentifiable; $M = 22.93$ Unidentifiable	Study 1: Germany Study 2: Germany Study 3: Unidentifiable	Study 1: Students from university Study 2: Participants on the campus of a German University Study 3: Unidentifiable A nationally representative survey	Study 1: Experimental Study 2: Experimental Study 3: Experimental
Bolsen & Druckman (2018)	Do partisanship and politicization undermine the impact of a scientific consensus message about climate change?	United States	1	Unidentifiable	United States		Experimental
Lalor et al. (2018)	Compensation and consistency effects in pro-environmental behaviour: The moderating role of majority and minority support for pro-environmental values	Switzerland	3	Study 1: Range = 21–74; $M = 34.5$ Study 2: Range = 17–62; $M = 24.3$ Study 3: Range = 18–67; $M = 24.94$	Study 1: United States Study 2: Switzerland Study 3: Switzerland	Study 1: MTurk Study 2: Students from a Swiss University Study 3: Students from a Swiss University	Study 1: Experimental Study 2: Experimental Study 3: Experimental
Swim & Geiger (2018)	The gendered nature of stereotypes about climate change opinion groups	United States	1	Range = 18–86; $M = 33$	United States	MTurk, students from university	Experimental
Uhl et al. (2018)	Undesirable effects of threatening climate change information: A cross-cultural study	Austria	1	Austria: Range unidentifiable; $M = 24.8$ Argentina: Range unidentifiable; $M = 28$	Austria, Argentina	Recruited via social networks and university mailing lists	Experimental
Vainio et al. (2014)	System justification and the perception of food risks	Finland	2	Study 1: Unidentifiable Study 2: Range unidentifiable; $M = 24$	Study 1: Finland Study 2: Finland	Study 1: Existing data (the Eurobarometer 73.5) Study 2: Students from universities	Study 1: Correlational Study 2: Correlational
<i>Journal of Applied Social Psychology</i>							
Barnett et al. (2019)	Politics, concern for future generations, and the environment: Generativity mediates political conservatism and environmental attitudes	United States	2	Study 1: Range = 18–29; $M = 20.47$ Study 2: Range = 18–29; $M = 20.54$	Study 1: United States Study 2: United States	Study 1: Students from university Study 2: Students from university	Study 1: Correlational Study 2: Correlational
Clarke et al. (2019)	Mitigation system threat partially mediates the effects of right-wing ideologies on climate change beliefs	Australia	1	Range = 19–70; $M = 34.7$	United States	MTurk	Correlational

Table 1 (continued)

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
Eiser et al. (1995)	Global changes and local accidents: Consistency in attributions for environmental effects	United Kingdom	1	Range unidentifiable; $M = 37.7$	United Kingdom	Vacationers on four beaches on the south coast of Devon and Cornwall	Correlational
Goldberg et al. (2019)	The role of anchoring in judgments about expert consensus	United States	1	Range unidentifiable; $M = 34$ (MTurk), 41 (TurkPrime), 57 (Facebook)	Unidentifiable	MTurk, TurkPrime, Facebook	Experimental
Meijnders et al. (2001)	Communications about environmental risks and risk-reducing behavior: The impact of fear on information processing	Netherlands	1	Range unidentifiable; $M = 53.27$	Unidentifiable	Unidentifiable	Experimental
Milfont et al. (2012)	The climate change dilemma: Examining the association between parental status and political party support	New Zealand	1	Range = 16–83; $M = 28.4$	New Zealand	New Zealand citizens from Auckland	Correlational
Sapiains et al. (2016)	Individual responses to climate change: Framing effects on pro-environmental behaviors	Chile	1 (Study 2)	Range = over 18; M unidentifiable	Australia	Australian residents living in Brisbane, recruited via posters in public buildings and Internet advertisements	Experimental
<i>Journal of Experimental Social Psychology</i>							
Eom et al. (2018)	Social class, control, and action: Socioeconomic status differences in antecedents of support for pro-environmental action	United States	4	Study 1: Range = 18 or older; The M th age group was between 45 and 49 Study 2: Range = adults; $M = 34.25$ Study 3: Range = adults; $M = 33.02$ Study 4: Range unidentifiable; $M = 20$	Study 1: United States Study 2: United States Study 3: United States Study 4: United States	Study 1: Existing data (the American National Election Studies (ANES) 2016) Study 2: MTurk Study 3: MTurk Study 4: Students from university	Study 1: Correlational Study 2: Correlational Study 3: Experimental Study 4: Correlational
Sacchi et al. (2016)	Myopic about climate change: Cognitive style, psychological distance, and environmentalism	Italy	2	Study 1: Range = 18–62; $M = 28.75$ Study 2: Range unidentifiable; $M = 22.87$	Study 1: Italy Study 2: Italy	Study 1: Students from university Study 2: Students from university	Study 1: Correlational Study 2: Experimental
Wolsko et al. (2016)	Red, white, and blue enough to be green: Effects of moral framing on climate change attitudes and conservation behaviors	United States	3	Study 1: Range unidentifiable; $M = 31.63$ Study 2: Range unidentifiable; $M = 36.27$ Study 3: Range unidentifiable; $M = 32.08$	Study 1: United States Study 2: Unidentifiable Study 3: Unidentifiable	Study 1: Students from community college Study 2: MTurk Study 3: MTurk	Study 1: Experimental Study 2: Experimental Study 3: Experimental

Table 1 (continued)

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
<i>Journal of Personality and Social Psychology</i>							
Campbell and Kay (2014)	Solution aversion: On the relation between ideology and motivated disbelief	United Kingdom	3 (Studies 1–3)	Study 1: Range unidentifiable; $M = 44.31$ Study 2: Range unidentifiable; $M = 35.06$ Study 3: Range unidentifiable; $M = 31.64$ Unidentifiable	Study 1: United States Study 2: United States Study 3: United States	Study 1: Research agency (Qualtrics) Study 2: MTurk Study 3: MTurk	Study 1: Correlational Study 2: Experimental Study 3: Experimental
Maglio & Polman (2016)	Revising probability estimates: Why increasing likelihood means increasing impact	Canada	1 (Study 5)	Unidentifiable	Unidentifiable	Students from university	Experimental
Risen & Critcher (2011)	Visceral fit: While in a visceral state, associated states of the world seem more likely	United States	7	Study 1: Unidentifiable Study 2: Unidentifiable Study 3: Unidentifiable Study 4: Unidentifiable Study 5: Unidentifiable Study 6a: Unidentifiable Study 6b: Unidentifiable	Study 1: United States Study 2: United States Study 3: United States Study 4: United States Study 5: United States Study 6a: United States Study 6b: United States	Study 1: Students from university Study 2: Students from university Study 3: Students from university Study 4: Students from university Study 5: Students from university Study 6a: Students from university Study 6b: Students from university	Study 1: Correlational Study 2: Experimental Study 3: Experimental Study 4: Experimental Study 5: Experimental Study 6a: Experimental Study 6b: Experimental
Rothschild et al. (2012)	A dual-motive model of scapegoating: Displacing blame to reduce guilt or increase control	United States	3	Study 1: Range = 18–55; M unidentifiable Study 2: Range = 18–25; M unidentifiable Study 3: Range 18–25; M unidentifiable	Study 1: United States Study 2: United States Study 3: United States	Study 1: Participants on a Midwestern university campus Study 2: Students from university Study 3: Students from university	Study 1: Experimental Study 2: Experimental Study 3: Experimental
<i>Journal of Social Issues</i>							
Leviston & Uren (2020)	Overestimating one's "green" behavior: Better-than-average bias may function to reduce perceived personal threat from climate change	Australia	1	<24: 7.3%; 25–34: 15.7%; 35–44: 16%; 45–54: 16.7%; 55–64: 20.3%; 65–74: 19%; 75+: 5%	Australia	Representative sample recruited from an online survey panel managed by The Online Research Unit	Correlational

Table 1 (continued)

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
Panno et al. (2019)	Attitudes towards Trump policies and climate change: The key roles of aversion to wealth redistribution and political interest	Italy	1	Range = 18–90, $M = 50.13$	United States	Existing data (the ANES 2016 Time Series Study)	Correlational
Swim & Becker (2012)	Country contexts and individuals' climate change mitigating behaviors: A comparison of U.S. vs. German individuals' efforts to reduce energy use	United States	1	United States: Range = 18–29; $M = 19.23$ Germany: Range = 18–58; $M = 23.66$	United States, Germany	Students from college (United States), students from college and convenience sample (Germany)	Correlational
<i>Journal of Social Psychology</i>							
X. Wang (2018)	The role of attitudinal motivations and collective efficacy on Chinese consumers' intentions to engage in personal behaviors to mitigate climate change	United States	1	Range unidentifiable; $M = 28.8$	China	Data collected with a panel provided by sojump.com	Correlational
<i>Personality and Individual Differences</i>							
Häkkinen & Akrami (2014)	Ideology and climate change denial	Sweden	2	Study 1: Range = 18–61; $M = 25.8$ Study 2: Unidentifiable	Study 1: Unidentifiable Study 2: Unidentifiable	Study 1: Online recruitment on a website, announcements on notice boards Study 2: Online recruitment on a website MTurk	Study 1: Correlational Study 2: Experimental
Jessami & Harris (2018)	Personality, politics, and denial: Tolerance of ambiguity, political orientation and disbelief in climate change	United States	1	Range = 19–75; $M = 37.08$	United States	MTurk	Correlational
Jylhä & Akrami (2015)	Social dominance orientation and climate change denial: The role of dominance and system justification	Sweden	1	Range = 18–72; $M = 28.45$	Sweden	Online recruitment by announcement on a webpage, notice boards, face-to-face invitation	Correlational
Jylhä et al. (2016)	Denial of anthropogenic climate change: Social dominance orientation helps explain the conservative male effect in Brazil and Sweden	New Zealand	1	Brazil: Range unidentifiable; $M = 29.7$ Sweden: Range unidentifiable; $M = 28.45$	Brazil, Sweden	Online questionnaires sent via e-mail, online social networks, notice boards, face-to-face invitation	Correlational
Liem & Martini (2015)	Young people's responses to environmental issues: Exploring the roles of adaptability and personality	Australia	1	Range unidentifiable; $M = 14.51$	Australia	Students from high schools	Correlational
Odea et al. (2018)	Social vigilantism and the extremity, superiority, and defense of attitudes toward climate change	United States	2	Study 1: Range unidentifiable; $M = 36.63$ Study 2: Range unidentifiable; $M = 36.43$	Study 1: United States Study 2: United States	Study 1: MTurk Study 2: MTurk	Study 1: Correlational Study 2: Experimental

Table 1 (continued)

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
Stanley, Wilson, Sibley, & Milfont. (2017)	Dimensions of social dominance and their associations with environmentalism	New Zealand	3	Study 1: Range unidentifiable; $M = 48.09$ Study 2: Unidentifiable Study 3: Range unidentifiable; $M = 18.7$	Study 1: New Zealand Study 2: New Zealand Study 3: New Zealand	Study 1: Existing data (the 2009 New Zealand Attitudes and Values Study) Study 2: Students from university Study 3: Students from university	Study 1: Correlational Study 2: Correlational Study 3: Correlational (longitudinal)
Stanley, Wilson, & Milfont. (2017)	Exploring short-term longitudinal effects of right-wing authoritarianism and social dominance orientation on environmentalism	New Zealand	1	Range unidentifiable. $M = 18.7$	New Zealand	Students from university	Correlational (longitudinal)
van der Linden (2015)	The conspiracy-effect: Exposure to conspiracy theories (about global warming) decreases prosocial behavior and science acceptance	United States	1	Range = 18-65, with modal age bracket = 25-44	United States	MTurk	Experimental
<i>Personality and Social Psychology Bulletin</i>							
Bain et al. (2013)	Collective futures: How projections about the future of society are related to actions and attitudes supporting social change	Australia	1 (Study 1)	Range unidentifiable. $M = 40.13$	Australia	Australia community sample	Correlational
Feygina et al. (2010)	System justification, the denial of global warming, and the possibility of "system-sanctioned change"	United States	3	Study 1: Range unidentifiable; $M = 19.1$ Study 2: Unidentifiable Study 3: Unidentifiable	Study 1: United States Study 2: United States Study 3: United States	Study 1: Students from university Study 2: Students from university Study 3: Students from university	Study 1: Correlational Study 2: Correlational Study 3: Experimental

Table 1 (continued)

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
Lifshin et al. (2016)	It's the end of the world and I feel fine: Soul belief and perceptions of end-of-the-world scenarios	United States	2 (Studies 4 and 5)	Study 4: Range unidentified; $M = 18.67$ Study 5: Range unidentified; $M = 19.02$	Study 4: United States Study 5: United States	Study 4: Students from university Study 5: Students from university	Study 4: Experimental Study 5: Experimental
Milfont et al. (2013)	Environmental consequences of the desire to dominate and be superior	New Zealand	4	Study 1: Range = over 18; $M = 48$ Study 2: Unidentifiable Study 3: Range = 16–51; $M = 20$ Study 4: Range unidentified; $M = 50.71$	Study 1: New Zealand Study 2: 27 countries [‡] Study 3: New Zealand Study 4: New Zealand	Study 1: Existing data (the New Zealand Attitudes and Values Study 2009) Study 2: Existing country-level data (SDO data from a previous study; country-level environmentalism based on five indices) Study 3: Students from university Study 4: Advertisements - n newspaper	Study 1: Correlational Study 2: Correlational (country level) Study 3: Correlational Study 4: Correlational
Ruijens et al. (2018)	Not all skepticism is equal: Exploring the ideological antecedents of science acceptance and rejection	Netherlands	3	Study 1: Range unidentified; $M = 37.43$ Study 2: Range unidentified; $M = 48.08$ Study 3: Range unidentified; $M = 35.8$	Study 1: United States Study 2: United States Study 3: United States	Study 1: MTurk Study 2: Existing data (the International Social Survey Programme: Environment III, US data) Study 3: MTurk	Study 1: Correlational Study 2: Correlational Study 3: Correlational
<i>Political Psychology</i> Bayes et al. (2020)	When and how different motives can drive motivated political reasoning	United States	1	18–24: 4.33%; 25–34: 14.77%; 35–50: 33.25%; 51–65: 32.79%; 65+: 14.87% Canada: Range = 17–51; $M = 20.53$ United States (1): Range = 18–77; $M = 37.48$ United States (2): Range = 19–74; $M = 35.61$ Range = 18–24: 7.2%; 25–54: 59.6%; 54+: 33.33%	United States	Research agency (Bovitz co.)	Experimental
Choma et al. (2020)	Right-wing ideology as a predictor of collective action: A test across four political issue domains	Canada	1		Canada, United States	Students from university (Canada), MTurk (United States)	Correlational
Jones & Song (2014)	Making sense of climate change: How story frames shape cognition	United States	1		United States	Research agency (Survey Sampling International)	Experimental

Table 1 (continued)

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
Nai <i>et al.</i> (2017)	Anxiety, sophistication, and resistance to persuasion: Evidence from a quasi-experimental survey on global climate change	Australia	1	Range unidentified; $M = 48.45$ (derived from year of birth)	Switzerland	Swiss citizens living in the French-speaking area of Switzerland	Quasi-experimental
<i>Social Behaviour and Personality</i>							
Tonn & Conrad (2007)	Thinking about the future: A psychological analysis	United States	1	Range = 13–83; $M = 40$	United States	Online web-based survey	Correlational
<i>Social Cognition</i>							
Bashir <i>et al.</i> (2014)	The time for action is now: Subjective temporal proximity enhances pursuit of remote-future goals	Canada	2	Study 1: Range unidentified; $M = 18.77$ Study 2: Range unidentified; $M = 19.18$ Range = 18–68; $M = 33$	Study 1: Unidentifiable Study 2: Unidentifiable	Study 1: Students from university Study 2: Students from university	Study 1: Experimental Study 2: Experimental
Hennes <i>et al.</i> (2012)	Not all ideologies are created equal: Epistemic, existential, and relational needs predict system-justifying attitudes	United States	1	Range = 18–68; $M = 33$	United States	MTurk	Correlational
Schuldt & Roh (2014)	Of accessibility and applicability: How heat-related cues affect belief in "global warming" versus "climate change"	United States	2	Study 1: Range unidentified; $M = 21.05$ Study 2: Range unidentified; $M = 19.62$	Study 1: United States Study 2: United States	Study 1: Passerby on a university campus Study 2: Students from university	Study 1: Experimental Study 2: Experimental
<i>Social Influence</i>							
Nolan <i>et al.</i> (2011)	Normative messages promoting energy conservation will be underestimated by experts ... unless you show them the data	United States	2	Study 1: Range = 23–65; $M = 39.4$ Study 2: Range = 21–73; $M = 44.46$	Study 1: United Arab Emirates, United States Study 2: United States	Study 1: Energy experts recruited through energy-related companies, an energy conservation listserv, and an energy conference Study 2: Attendees of a talk at an energy and sustainable living festival	Study 1: Correlational Study 2: Experimental
<i>Social Justice Research</i>							
Becker & Sparks (2016)	Neither fair nor unchangeable but part of the natural order: Orientations towards inequality in the face of criticism of the economic system	United Kingdom	1	Range = 18–65; $M = 24.15$	United Kingdom	Contacts of the first author, and contacts of those contacts	Experimental
Clayton (2018)	The role of perceived justice, political ideology, and individual or collective framing in support for environmental policies	United States	1	Unidentifiable	United States	MTurk	Experimental

Table 1 (continued)

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
Clayton et al. (2013)	Making sense of the senseless: Identity, justice, and the framing of environmental crises	United States	2	Study 1: Unidentifiable Study 2: Unidentifiable	Study 1: United States Study 2: United States	Study 1: MTurk Study 2: MTurk	Study 1: Experimental Study 2: Experimental
Dreyer & Walker (2013)	Acceptance and support of the Australian carbon policy	United States	1	Range = 18–47; <i>Mdn</i> = 46	Australia	Recruited from a research-only panel	Correlational
McKinney & Fuikerson (2015)	Gender equality and climate justice: A cross-national analysis	United States	1	Unidentifiable	150 countries [§]	Existing country-level data (Global Footprint Network, World Bank, and previous studies)	Correlational (country level)
<i>Social Psychological and Personality Science</i>							
Chapman & Lickel (2016)	Climate change and disasters: How framing affects justifications for giving or withholding aid to disaster victims	United States	1	Range unidentifiable; <i>M</i> = 36.79	United States	MTurk	Experimental
Ehret et al. (2018)	Partisan barriers to bipartisanship: Understanding climate policy polarization	United States	2	Study 1: Range unidentifiable; <i>M</i> = 39.3 Study 2: Range unidentifiable; <i>M</i> = 40.31	Study 1: United States Study 2: United States	Study 1: Turk Prime Study 2: Turk Prime	Study 1: Experimental Study 2: Experimental
Poojien et al. (2013)	Promoting or jeopardizing lighter carbon footprints? Self-affirmation can polarize environmental orientations	United Kingdom	1	Range = 18–48; <i>M</i> = 22.32	United Kingdom	Students from university	Experimental
<i>Qualitative Studies</i>							
<i>British Journal of Social Psychology</i>							
Kurz et al. (2010)	Contesting the 'national interest' and maintaining 'our lifestyle': A discursive analysis of political rhetoric around climate change	United Kingdom	1	n.a.	Australia	Public speeches, television and radio media interviews, official political party media releases, and transcripts of debates in both houses of the Australian Parliament	Discursive analysis
<i>European Journal of Social Psychology</i>							
Leviston et al. (2014)	Imagining climate change: The role of implicit associations and affective psychological distancing in climate change responses	Australia	2	Study 1: <24: 5.2%; 25–34: 14%; 35–44: 16.6%; 45–54: 20.7%; 55–64: 22.1%; 65–74: 17.4%; 75–84: 3.8%; 85+: 0.3%. Study 2: <24: 19.5%; 25–34: 9.8%; 35–44: 4.9%; 45–54: 24.4%; 55–64: 14.6%; 65+: 26.8%	Study 1: Australia Study 2: Australia	Study 1: Australian public recruited through an online panel Study 2: Participants from four workshops conducted in Perth	Study 1: Coding Study 2: Thematic analysis

Table 1 (continued)

Authors	Article Title	Country of Corresponding Author's Affiliation	No. of Studies	Participant Age	Country of Origin of Participants or Data	Sampling Method	Research Design
<i>Journal of Community and Applied Social Psychology</i>							
Sapstains et al. (2016)	Individual responses to climate change: Framing effects on proenvironmental behaviors	Chile	1 (Study 1)	Range = 18–70; <i>M</i> unidentifiable	Australia	Australian residents recruited by a professional agency	Inductive coding
<i>Journal of Community and Applied Social Psychology</i>							
Caillaud et al. (2012)	The social representations of the ball climate conference in the French and German media	France	1	n.a.	France, Germany	Press reports on the U.N. climate conference held in Bali in 2007 by media in France and Germany	Triangulated designs
Culley et al. (2010)	Media framing of proposed nuclear reactors: An analysis of print media	United States	1	n.a.	United States	Articles in the Atlanta Journal-Constitution (AJC) and the Augusta Chronicle (AC)	Content analysis
Woods et al. (2018)	Moral (dis)engagement with anthropogenic climate change in online comments on newspaper articles	United Kingdom	1	n.a.	United Kingdom	U.K. national newspapers in Lexis Nexis database	Thematic analysis
<i>Revue Internationale de Psychologie Sociale</i>							
Caillaud & Fleck (2013)	New meanings for old habits? Representations of climate change in France and Germany	France	1	Range = 28–40; <i>M</i> unidentifiable	France, Germany	Interviews and focus groups with public from related professional fields (e.g., the medical field) with purposive sampling	Triangulated designs
Callaghan & Augoustinos (2013)	Reified versus consensual knowledge as rhetorical resources for debating climate change	Australia	1	n.a.	Australia	Interview records with two prominent Australian climate scientists	Critical discourse analysis

Note. †The 34 countries were Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Burundi, Canada, China, Colombia, Congo, Fiji, Germany, Hungary, India, Indonesia, Italy, Japan, Malaysia, Mexico, Netherlands, Norway, Pakistan, Peru, Philippines, Portugal, Russia, South Korea, Spain, Singapore, Switzerland, Taiwan, Tunisia, and United States.

‡The 27 countries were Australia, Belgium, Canada, China, France, Germany, Hungary, India, Israel, Italy, Japan, Lebanon, Mexico, Netherlands, New Zealand, Pakistan, Poland, Romania, Russia, Serbia & Montenegro, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, and United States.

§The 150 countries were Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Azerbaijan, Bangladesh, Belarus, Belgium, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Congo, Congo (Dem. Rep.), Costa Rica, Côte d'Ivoire, Croatia, Cuba, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Eritrea, Estonia, Ethiopia, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Haiti, Honduras, Hungary, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea (Democratic People's Rep), Korea (Republic of), Kuwait, Kyrgyzstan, Lao People's Dem. Rep., Latvia, Lebanon, Lesotho, Liberia, Libyan Arab Jamahiriyah, Lithuania, Macedonia, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, Somalia, South Africa, Spain, Sri Lanka, Sudan, Switzerland, Syrian Arab Republic, Tajikistan, Tanzania (United Republic of), Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, Viet Nam, Yemen, Zambia, and Zimbabwe.

Table 2
Frequency Counts Regarding Country of Corresponding Author's Affiliation

Country	Frequency	% (Of 80 Articles)
United States	29	36.25
Australia	11	13.75
United Kingdom	8	10.00
New Zealand	7	8.75
Italy	5	6.25
Germany	4	5.00
Canada	3	3.75
Sweden	3	3.75
France	2	1.25
Netherlands	2	2.50
Austria	1	1.25
Chile	1	1.25
Finland	1	1.25
Singapore	1	1.25
Switzerland	1	1.25
Taiwan	1	1.25

observations regarding psychological research in general (Arnett, 2008).

Observations Regarding Participants and Sources of Data

We then examined the country of origin of participants or data. Among the 130 studies, relevant information was unidentifiable or unreported in 12 studies. Among the remaining 118 studies, some reported only where the studies were conducted (e.g., university campus) without detailing the country of origin of the participants. We simplified our coding by assuming that all participants in each of these studies came from the country where the study was conducted. Some studies reported only the country of origin of the majority group among the participants. We simplified our coding by counting this country only. With these simplifications, based on our coding of the 118 studies, we had the following observations.

Dominance of data from WEIRD countries. Among the 118 studies, almost all of them (109 studies, 92.37%) involved samples or data from Western, educated, wealthy, and democratic countries. As in the case of authors, the United States again dominated the pool. Among the 118 studies, half of them (60 studies, 50.85%) involved samples or data collected from the United States. Viewed from a different angle, among the 118 studies, only 2 studies (1.69%) involved samples from Africa, only 5 (4.24%) involved samples from Latin America and the Caribbean, and only 8 (6.78%)

involved samples from Asia.⁵ Some of the data or samples from these regions came from less developed countries (countries with medium or low Human Development Index scores, such as Pakistan and Congo) or countries with nondemocratic regimes (e.g., China, Turkey). Still, given the small number of these samples, relative to the whole pool of reviewed studies, the dominance of samples and data from WEIRD countries was obvious.

Lack of cross-cultural research. Among the 118 studies, only 10 studies (8.47%) involved samples or data from more than one country. Seven of these studies involved only two countries, and the other three were large-scale comparisons involving a large set of countries. Overall, cross-cultural research was lacking.

Within the seven two-country studies, only three involved a non-Western country and a Western country (Argentina and Austria: Uhl et al., 2018; Brazil and Sweden: Jylhä et al., 2016; United Arab Emirates and the United States: Nolan et al., 2011, Study 1), and the other four involved two Western countries (Canada and the United States: Choma et al., 2020; France and Germany: Caillaud et al., 2012; Caillaud & Flick, 2013; Germany and the United States: Swim & Becker, 2012). Notably, all of the countries involved in these studies, Western or not, are relatively educated and wealthy; they have “high” (.70–.79) or “very high” ($\geq .80$) Human Development Index scores (United Nations Development Programme, 2020, n.d.). They also have democratic regimes (Marshall & Gurr, 2020). In sum, comparison of samples from WERID versus those from non-WEIRD countries was not found in these seven studies.

Also notable is that Choma et al. (2020) combined the participants from Canada and the United States into a pooled sample, and no comparison between the two countries was performed. Nolan et al. (2011, Study 1) used a small sample with only two energy experts from United Arab Emirates and 27 from the United States; in the analysis, all experts were pooled into one sample. In other words, these two studies did not present any truly cross-cultural comparison.

Within the three large-scale comparisons, two involved country-level comparisons; in other words, country-level data and indices were used in the analyses. Milfont et al. (2013, Study 2) compared 27 countries and examined the association between social dominance orientation and attitudes toward human–environment relationships. McKinney and Fulkerson (2015) compared 150 countries and examined the link between gender

⁵For the definitions of Africa, Latin America and the Caribbean, and Asia, we referred to the geographic region codes of the United Nations Statistics Division (n.d.).

equality and climate footprints. The other large-scale comparison by Liu and Sibley (2012) involved 34 countries. With multilevel analyses, this study showed that perceptions of the importance of climate change predicted willingness to make sacrifices to protect the environment more strongly in nations with a higher Human Development Index. These three large-scale comparisons, though small in number, did involve both WEIRD and non-WEIRD countries.

Reliance on student samples and young participants. Among the 119 quantitative studies with individuals as the unit of analysis, the data collection or sampling methods were identifiable for 117 studies. Among them, over 40% (51 studies, 43.59%) exclusively or partly used students as participants.

Among these 119 studies, information regarding the age of the participants was identifiable for 100 studies. It is noteworthy that the way age was reported varied hugely across the studies. Age range, age distribution, mean age, modal age or age group, and median age or age group were reported either alone or in some combination. In most cases, the mean, modal, or median age or age group fell into young to middle adulthood.⁶

Reliance on Amazon Mturk. Amazon MTurk was another major source of participants. Among the 117 studies with individuals as the unit of analysis and for which the data collection or sampling methods were identifiable, one fifth of them (24 studies, 20.00%) exclusively or partly involved Amazon MTurk participants.

In conclusion, what we observed regarding participants and sources of data largely corroborates with recent observations in other areas of psychology or psychological research in general. First, participants were drawn almost entirely from Western, developed, and democratic societies, to the exclusion of other regions, developing countries, and societies with nondemocratic regimes (Henrich *et al.*, 2010; Rad *et al.*, 2018). Second, the research focused narrowly on data collected from the United States (Arnett, 2008; Thalmayer *et al.*, 2020). Third, cross-cultural comparisons are still scarce (Tam & Milfont, 2020; Thalmayer *et al.*, 2020). Fourth, there is an overreliance of student participants or educated and young participants (Henrich *et al.*, 2010). Last, but not least, there has been a reliance of Amazon MTurk data, a trend referred to as “Mturkification” (Anderson *et al.*, 2019).

Observations Regarding Research Topics

We then examined the topics commonly seen in social psychology publications regarding climate change or global warming. In addition to reading the 80 articles in detail, we also performed a text analysis of the abstracts of the 80 articles in order to identify the common topics or phenomena of interest. Specifically, we used the “Phrases” function of *WordStat8* to identify the most frequently used phrases (with at least two words and five words at maximum) in these abstracts. Figure 1 shows the phrases with appearance in at least three abstracts. We removed the phrases “climate change” and “global warming” (or related phrases such as “anthropogenic climate change” and “issue of climate change”) from these figures, as all of the articles were already deemed to be relevant to climate change or global warming. We also removed those phrases that did not reveal the contents or substance of the article (e.g., “results suggest,” “present research,” “higher levels,” “practical implications,” “higher levels”).

Major outcome variables. From this analysis, we were able to identify the following clusters of outcomes examined in the 80 articles.

Climate change beliefs. The first cluster refers to studies that examined climate change beliefs as the outcome variable. Climate change beliefs can be broadly conceptualised as the cognitions people hold regarding the issue of climate change. They can be comprehensively measured with multiple components. For instance, Guy *et al.* (2014) measured climate change beliefs with a 13-item measure capturing whether participants believed that climate change was occurring, whether it was caused by human activities, and whether it carried negative consequences for humans and the environment. In some studies, the scope of climate change beliefs was narrower or more focused, wherein a specific belief regarding climate change was measured. For instance, both Goldberg *et al.* (2019) and van der Linden (2015) examined people’s perception of scientific agreement or consensus on human-caused climate change as an outcome variable.

Notably, a cluster of studies focused on the flip side of climate change beliefs, which was referred to as “climate change denial” (Clarke *et al.*, 2019; Häkkinen & Akrami, 2014; Jylhä & Akrami, 2015; Jylhä *et al.*, 2016; Jylhä & Hellmer, 2020; Panno *et al.*, 2019; 2017 Stanley, Wilson, & Milfont, 2017), “climate change skepticism” (Panno *et al.*, 2019; Rutjens *et al.*, 2018), or “climate change disbelief” (Campbell & Kay, 2014; Jessani & Harris, 2018). Again, this flip side of climate change beliefs has multiple components. For instance,

⁶Following the recommended age classification by United Nations (1982), we define young adulthood as 15–24 years, and middle adulthood as 25–44 years.

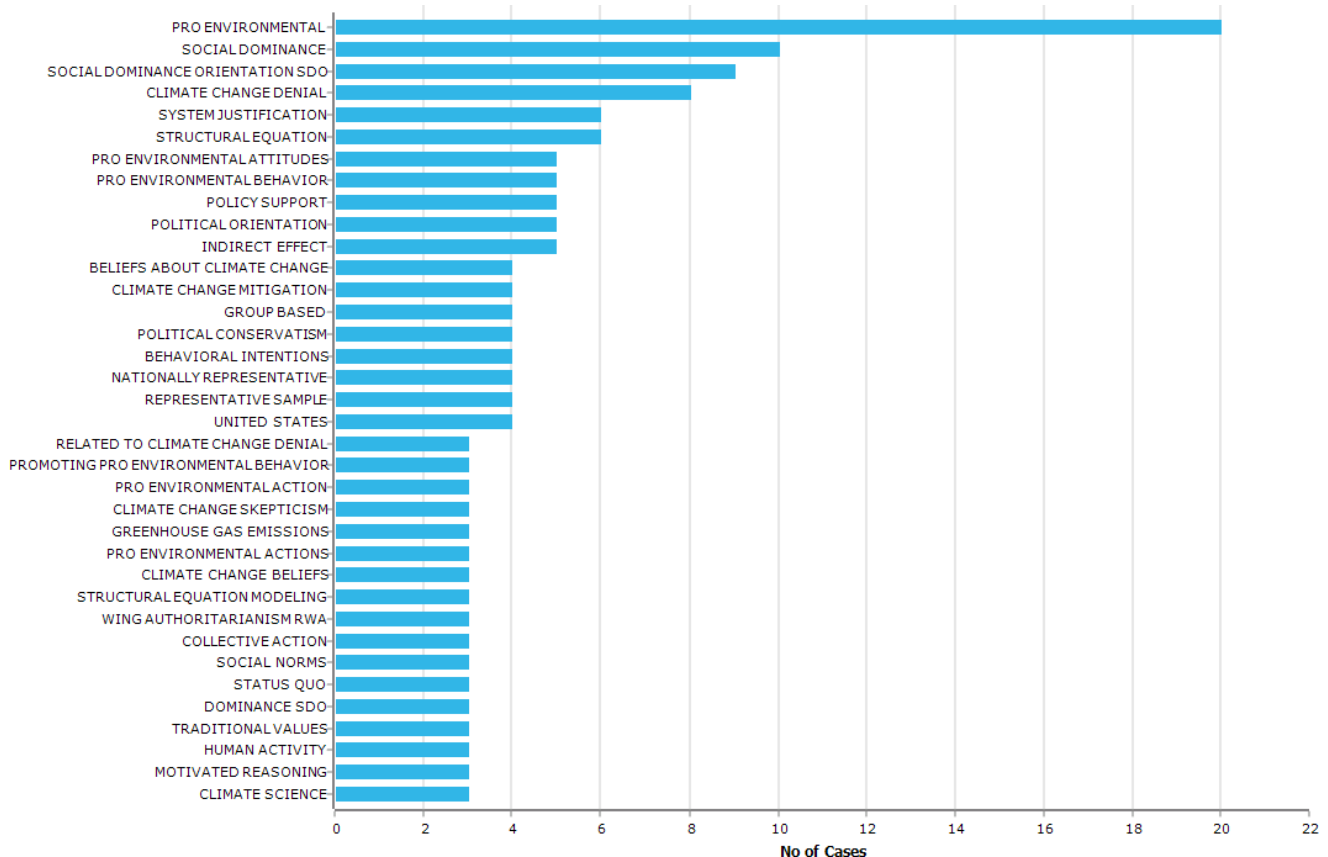


Figure 1 Distribution of most frequently used phrases in abstracts of the 80 articles. *Note.* The acronyms SDO (social dominance orientation) and RWA (right-wing authoritarianism) were used as in the abstracts of the 80 articles. They stand for social dominance orientation and right-wing authoritarianism, respectively. [Colour figure can be viewed at wileyonlinelibrary.com]

Clarke et al. (2019) examined the mediating mechanisms behind the linkage between right-wing ideologies and four types of climate change denial: existence denial, human cause denial, impact denial, and climate science denial.

Affect and risk perception. The second cluster refers to risk perception and affective responses in relation to climate change as a whole or specific climate-related events (e.g., flooding). In some of these studies, participants were asked to indicate their feelings toward climate events. For example, Leviston et al. (2014, Study 2) asked participants to identify images that they perceived to be most closely associated with climate change and then report their feelings about them. They observed that different climate change images were associated with different affective contents.

In other studies, participants were asked to estimate the likelihood of climate change or climate events happening either globally or locally, or to report how much risk to these events they personally faced. For example, Risen and Critcher (2011, Study 5) hypothesised that

people would judge events associated with their current visceral experience as more likely. With an experimental manipulation of visceral experience, they observed that participants who experienced thirst reported more pessimistic forecasts of drought and desertification. In one study, both affect and risk perception were measured: van der Linden (2014) observed that participants' personal experience of climate change was predictive of their risk perception and negative affect, and risk perception and negative affect mutually reinforced each other.

Private-sphere climate action. Another major cluster of outcomes examined in the 80 articles was behaviour in people's private sphere of life. Researchers used slightly varying labels (e.g., action vs. behaviour, pro-environmental vs. mitigation), but essentially, these studies were interested in what drives people's performance of behaviours that benefit the environment or harm the environment less and/or behaviour that can help reduce emissions and mitigate climate change. Typically, researchers collected data with respect to a set of behaviours in different domains (e.g., residential energy use,

recycling, transport, product purchase) and combined them into an aggregate index. For instance, Xue *et al.* (2016) examined the association between cultural worldviews, climate change risk perceptions, and how often participants performed 20 climate change mitigation actions. Notably, some studies measured intentions, not actual performance, of proenvironmental behaviour (Masson & Fritsche, 2014; Sacchi *et al.*, 2016). Also noteworthy is that a few articles focused on a specific domain of proenvironmental behaviour rather than proenvironmental behaviours in general, such as meat consumption in Rees *et al.* (2018) and energy use in Swim and Becker (2012).

Collective action and policy support. Most of the studies with proenvironmental behaviour as the outcome variable focused on those actions that happen in people's personal life (Rees *et al.*, 2018; X. Wang, 2018). Nevertheless, it is notable that some studies were focused on behaviours that are aimed at broader, more systematic changes in society, such as collective action and policy support.

A few studies considered collective action as the outcome of interest. Choma *et al.* (2020) considered a range of collective action (e.g., donating to environmental charities, signing petitions, organising events) and asked participants to indicate their willingness to take part in this action. Other studies focused on a specific type of collective action. For instance, Rees and Bamberg (2014) focused on a specific form of collective action: participating in a neighborhood-based climate initiative. Milfont *et al.* (2012) focused on participants' voting intention with respect to different political parties in New Zealand. Collective action differs from private-sphere climate action in the sense that it is aimed at changing the action by other people and key decision-makers in society (e.g., the government, businesses) through persuasion, pressuring, or lobbying.

Some other studies treated people's support for pro-climate policies as the outcome variable. Policy support was measured either narrowly with respect to a single policy or comprehensively with a range of policies. For the former, for example, Dreyer and Walker (2013) focused on carbon tax in Australia, and Bertolotti and Catellani (2015) focused on national investment in renewable energy sources. For the latter, for example, Xue *et al.* (2016) measured policy support with an index based on five policies, and Clayton (2018) similarly used an index based on various policy types (e.g., taxes, subsidies, prohibitions).

Notably, some studies measured more than one type of proenvironmental behaviour. In addition to policy support, Xue *et al.* (2016) measured private-sphere climate action. The study by Walker *et al.* (2015) was apparently the most comprehensive among the studies

reviewed here; they measured personal mitigation behaviour, collective climate action, and policy support. With multiple measures of proenvironmental behaviour, researchers were able to pin down the variations in terms of what predicts personal behaviour, collective action, and policy support, respectively (Walker *et al.*, 2015).

Major theoretical angles. The analysis also allowed us to identify the theoretical angles researchers adopted in these articles to predict or explain the outcome variables discussed earlier.

Sociopolitical processes. The most frequently seen theoretical focus in the reviewed articles was the sociopolitical processes behind people's disbelief or denial of climate change and their inaction. Several perspectives were adopted to understand these processes. The most common perspective is to consider the role of ideologies behind people's responses to climate change. The ideological variables used included political orientation and conservatism (Barnett *et al.*, 2019; Häkkinen & Akrami, 2014; Jessani & Harris, 2018; Rutjens *et al.*, 2018), right-wing populism (Jylhä & Hellmer, 2020), cultural worldviews such as individualism and egalitarianism (Guy *et al.*, 2014; Xue *et al.*, 2016), and conspiracy theories (van der Linden, 2015). In a few studies, ideologies were operationalised in terms of political partisanship (Bolsen & Druckman, 2018; Ehret *et al.*, 2018). Notably, the most predominant ideological variable in this pool of research is social dominance orientation and its close associate, right-wing authoritarianism (Clarke *et al.*, 2019; Häkkinen & Akrami, 2014; Jylhä & Akrami, 2015; Jylhä *et al.*, 2016; Leung & Koh, 2019; Milfont *et al.*, 2013; Stanley, Wilson, & Milfont, 2017; Stanley, Wilson, Sibley, & Milfont, 2017). A general conclusion from these studies is that some people deny the existence of the problem of climate change and hence display inaction partly because the solutions needed to address the problem conflict with the values and ideologies these people hold (i.e., solution aversion; Campbell & Kay, 2014).

Another widely used perspective in the understanding of the sociopolitical processes behind climate change responses is the system justification theory (Feygina *et al.*, 2010). Viewed from this theory, humans' denial and inaction in response to climate change are driven by the motivational tendency to defend and justify the status quo in society. This theory was adopted in several studies (Becker & Sparks, 2016; Feygina *et al.*, 2010; Hennes *et al.*, 2012; Jylhä & Akrami, 2015; Panno *et al.*, 2019; Vainio *et al.*, 2014).

Persuasion processes. Another major theoretical focus in the reviewed articles was to understand the

effectiveness of different persuasion strategies in motivating beliefs in climate change, pro-climate attitudes, and climate action. Some of these studies focused on identifying the message frames that are more effective (Bertolotti & Catellani, 2014). For example, Sapiains et al. (2016, Study 2) compared the effect of four different frames (e.g., identity, conservation, economic prosperity, and climate change) on behavioural intentions. Meijnders et al. (2001) examined the effectiveness of different doses of fear appeal in a persuasive message about energy-conserving light bulbs. Most of these studies acknowledged that there would likely be a Message \times Person interaction (Nai et al., 2017). That is, a persuasive message is expected to be more effective when its contents resonate with the audience's motivations (Bayes et al., 2020). For example, Chapman and Lickel (2016) observed that climate change skeptics' responses to a message about a famine caused by severe droughts depended on whether or not the message attributed the droughts to climate change. Wolsko et al. (2016) found that conservatives, but not liberals, responded in a more proenvironmental manner after reading a message with a binding moral frame, wherein protecting the environment was emphasised on the moral grounds of obedience, purity, and patriotism.

Group-related processes. Another major theoretical focus in the reviewed articles was to explicate the group-related processes underlying human responses to climate change. Most of these studies referred to the influence of group norms. Some of these studies also considered the interplay between group norms and group identity. For example, Masson and Fritsche (2014) observed that individuals' behaviour adhered more strongly to climate-related group norms when these individuals had stronger self-investment in the group; the other dimension of group identity—self-definition—did not bear this effect, however. A different relationship between identity and norms was examined by Rees and Bamberg (2014). These researchers observed that perceived behavioural norms in the neighbourhood, along with collective efficacy and group-based emotions, predicted intention to participate in a community-based climate initiative. Moreover, perceived behavioural norms mediated the effect of identification with the neighbourhood on such intention.

One study took a different angle in the understanding of norms. Nolan et al. (2011) examined how normative energy-related messages were perceived by energy experts. They observed that, generally speaking, energy experts tended to underestimate the potency of normative messages in motivating energy-saving behaviour. Nolan et al. therefore concluded that psychologists have more to do in terms of giving psychology

away to people who can use it to make positive changes in society.

A few other studies examined a different set of group-related processes. Two studies examined how people might respond to climate change with group-defensive behaviours. Uhl et al. (2018) argued that climate change information may represent existential threat, and people therefore may respond to it with symbolic defensive behaviour instead of mitigation behaviour. They observed that reading about climate change could trigger derogation of the outgroup (in the form of ethnocentrism), but ingroup affirmation can buffer against this effect. A similar reasoning was offered by Barth et al. (2018). One central theme of these studies is that climate change is perceived as threatening. The researchers further theorised that because ingroups can provide extended primary control, when threatened by climate change, people may show increased conformity with ingroup norms (even for norms of radical behaviour) and group-defensive behaviour (in the form of derogating group members who exhibited behaviours that harmed the group).

Worth mentioning is a study by Swim and Geiger (2018), which examined how opinion groups in the context of climate change are perceived. These researchers observed that people tended to associate different climate opinion groups with different stereotypic traits, and the valence of such association was moderated by people's personal opinion regarding climate change. Notably, little research was conducted to understand how people respond to climate change through the lens of intergroup dynamics.

Other processes. A few studies considered the justice-related issues behind human responses to climate change (Clayton, 2018; Clayton et al., 2013; McKinney & Fulkerson, 2015; Walker et al., 2015). Several studies examined people's subjective or psychological distance from climate change (Bashir et al., 2014; Leviston et al., 2014; Sacchi et al., 2016). Several studies situated people's responses to climate change in terms of how they viewed future generations and the future world (Bain et al., 2013; Barnett et al., 2019; Tonn & Conrad, 2007). In addition to the themes already mentioned, the remaining studies showed a variety of theoretical frameworks.

Climate change discourse. As reported earlier, nine studies were qualitative. Most of these studies concerned the discourse about climate change, but they differed in terms of the domain of the texts analysed. Five of the studies focused on the general public. Woods et al. (2018) used a thematic analysis of 300 online comments to British newspaper articles on climate change and observed that moral disengagement through denial of the

problem of climate change was widespread. Caillaud and Flick (2013) conducted interviews and focus groups in France and Germany to understand people's knowledge and representations regarding climate change. Sapiains *et al.* (2016, Study 1) conducted focus groups in Brisbane, Australia to explore different frames people used when thinking about climate change. Leviston *et al.* (2014, Studies 1 & 2) used multiple methods to examine affective content in people's associations with climate change. Two studies examined how climate change and related issues were discussed in the media. Specifically, Caillaud *et al.* (2012) analysed how the issue of climate change and the Bali climate conference were represented in the French and German media. Culley *et al.* (2010) analysed the coverage of proposed nuclear reactors in the editorials and news articles from two local newspapers in Georgia, the United States.

The remaining two studies focused on more specific groups. Kurz *et al.* (2010) focused on the political discourse. These researchers analysed the rhetoric (in the forms of transcripts of parliamentary debate and statements broadcast in the media) produced by politicians from major political parties in Australia during the period between the release of the Intergovernmental Panel on Climate Change report and the national election. Callaghan and Augoustinos (2013) focused on scientists' opinions. Specifically, they analysed interviews with two prominent Australian scientists who had opposing views on climate change and regularly spoke about the issue, plus newspaper articles written by other scientists who held competing views.

General Discussion

The systematic review reported earlier allows us to holistically assess the social psychological literature of climate change. There are certainly some areas of strength in this literature, such as its diversity of research designs, outcome variables, and theoretical angles. However, we should also be conscious of what areas have been overlooked. In the following, we summarize three major gaps in this literature and discuss directions for future research.

Before moving to the discussion, we reiterate that our review covers a sample comprised of climate-change-related studies that were published in social psychological journals. This sampling method is valid in terms of ascertaining the social psychological substance of the reviewed research as it takes advantage of the triangulation among authors, reviewers, and editors. However, the representativeness of our sample is difficult to determine. As acknowledged earlier, relevant publications in non-social-psychological journals were not sampled. If these publications for some reasons are systematically more

rigorous than those we sampled, they perhaps do not suffer from the problems we have identified, and our observations in this review would have overestimated the severity of these problems. When reading the following discussion, readers should bear this caveat in mind.

Need To Expand Geographical and Demographic Representation

As noted in the Observations Regarding Authors section and the Observations Regarding Participants and Sources of Data section, in terms of both authorship and sources of data, the social psychological literature of climate change is predominately associated with WEIRD societies. With few exceptions, social psychological research on this topic was conducted by authors affiliated with institutions and used data collected from Western, developed, and democratic societies. This trend is nothing new; in fact, it characterises psychological and behavioural research in general (Henrich *et al.*, 2010; Thalmayer *et al.*, 2020). A related issue is the lack of cross-cultural research in this literature.

These observations possibly reflect two issues about psychological research in general. First, there are more research resources (e.g., funding, training) in WEIRD societies. As a result, there are naturally more psychological research outputs from these countries. Second, as Arnett (2008) observed, the essential philosophy underlying psychology was and remains to be an emphasis on identifying universals. That is, if psychological processes are assumed to be universal, then a narrow geographical representation and hence a neglect of cultural contexts would not be seen as a problem. Another potential interpretation for the dominance of WEIRD societies in the reviewed literature concerns the topic of climate change specifically: It is possible that climate change is a more relevant issue or a more contentious issue in WEIRD countries and therefore attracts more research attention. It is beyond our scope in this article to verify which explanation holds true. Nevertheless, regardless of the explanation, we recognise a need for theories that understand how humans respond to climate change as a function of not only individual-level processes but also the influence of sociocultural contexts (Tam, 2020; Tam & Milfont, 2020), as recent studies have already revealed substantial variations across societies and cultures regarding people's responses to environmental problems (Chan & Tam, 2021; Milfont & Markowitz, 2016; Tam & Chan, 2017).

Many have already made a call for expanding the geographical and demographic representation of psychological and behavioural research (Arnett, 2008; Henrich *et al.*, 2010). We echo this call, especially given that climate change is a global problem that concerns people

from every corner of the planet. We reckon that in addition to using data from a more representative sample of regions and cultures, researchers should consider both between-region/culture and within-region/culture comparisons.

Another issue we have identified concerns about the heavy reliance on student participants and MTurk samples. Again, this issue applies to other areas of psychology as well (Anderson et al., 2019; Henrich et al., 2010). There have been a number of discussions regarding the opportunities and perils of the increasing use of MTurk participants. On one hand, findings have shown that MTurk participants could be more representative of the United States population than standard online samples or college-student samples (Buhrmester et al., 2011) and more attentive to instructions than traditional student subject-pool participants (Hauser & Schwarz, 2016). On the other hand, the lack of naïvety of MTurk participants is concerning; findings have shown that MTurk workers are less naïve and more dishonest compared to other crowdsourcing platforms (Peer et al., 2017). The most alarming issue is that the increasing prevalence of MTurk studies, which are relatively inexpensive and found to be generally short in terms of duration, may crowd out more time-consuming offline studies (Anderson et al., 2019). Researchers interested in the topic of climate change should be mindful of the possibility that with increasing reliance on MTurk samples, we risk losing investigations that address important questions and require complicated research designs and in-depth analyses (e.g., field experiments, interventions, longitudinal studies).

A related notable observation regarding sampling is that most of the reviewed studies focused on laypeople. Research on special groups such as climate activists (Boucher et al., 2021), climate scientists (Callaghan & Augoustinos, 2013), and political and industry leaders are lacking despite their self-evident importance in the issue of climate change. Investigations into the potential variations across different sectors (e.g., age groups, socioeconomic classes, occupational groups) within a population are also mostly missing. We believe that the social psychology of climate change will benefit from casting a wider net in terms of the demographic backgrounds of research participants.

Widening the geographical and demographic representation in social psychology research on climate change is not exclusively researchers' responsibility. Science is supported by multiple institutions (e.g., universities, funding agencies, professional associations, publishers), and researchers respond to the normative practices and behavioural rules in these institutions. Thus, we also encourage institutional changes (Brady et al., 2018). Some examples of such changes include journals

requiring authors to explicitly discuss the cultural and demographic representativeness of their data (Arnett, 2008) and incentivising contributions with an explicit cultural perspective with such instruments as "diversity badges" (Rad et al., 2018).

Need for Outcomes Other Than Climate Change Mitigation

It is impressive that social psychologists have already investigated a wide array of climate-change-related outcome variables, as reported in the Major outcome variables section. These variables range from cognitions (e.g., climate change beliefs) to affect (e.g., feelings toward climate events) to behaviour (e.g., proenvironmental behaviour).

In terms of behavioural responses to climate change, the reviewed studies primarily focused on behaviour that is enacted privately and individually (i.e., private-sphere climate action). Collective action in the political realm was also studied, though to a lesser degree. Remarkably, climate action that happens in other domains of life was largely unexplored. Social psychologists should bear in mind that individuals' environmental behaviour is not always consistent across different life contexts. For example, people who adopt a range of proenvironmental behaviour at home may or may not show similar behaviour when they travel on holidays (Barr et al., 2010). Additionally, people tend to show mixed patterns of environmental behaviour across their home space, workplace, and public space (H. Chen et al., 2017). Future social psychological research using climate action as the outcome variable should take into consideration its intricacy. The now-classic typology of environmentally significant behaviour by Stern (2000) is a key reference in this regard.

Another issue regarding the reviewed studies is the predominant focus on climate change mitigation and lack of attention to adaptation. Some of the negative impacts of climate change have already happened. Thus, reducing or protecting people from such impacts is critically important (Reser & Swim, 2011). The potential contribution of social psychology to the understanding of climate change adaptation has been recognised (Bechtoldt et al., 2020; Clayton, 2020). However, none of the reviewed studies explicitly investigated adaptation behaviour. Relatedly, how climate change impacts individuals and communities was also largely unexplored in the reviewed social psychological literature. The multitude of such impacts has been elaborated elsewhere (Doherty & Clayton, 2011; Evans, 2019). People's physical health and mental wellbeing may suffer from climatic events. Moreover, there are many other impacts that are not directly related to health but fall into the

typical scope of social psychological research, such as social interactions, aggression, intergroup conflicts, and cultural change (Adger *et al.*, 2013; Evans, 2019). In sum, this lack of empirical attention to climate change adaptation and climate change impacts is obviously a gap within the social psychological literature of climate change that needs to be filled.

Need for More “Social” Theoretical Perspectives

The psychological understanding of climate change and other environmental issues has been criticised by some for being dominated by individualistic perspectives (Ferguson *et al.*, 2016; van Zomeren, 2014). That is, existing theories tend to focus on subjective and intrapsychic processes. To a large extent, this criticism applies to the reviewed social psychological literature as well. It is true that social psychologists have paid attention to not only such processes that are intrapersonal or intrapsychic (e.g., persuasion, personality, values) but also those that are sociopolitical and group-related (e.g., norms, social identity), as reported in the Major theoretical angles section. It is also true that they have considered not only personal behaviour but also collective action as outcome variables. However, it is noteworthy that in actual research operationalisations, the focal psychological processes and outcome variables were very often reduced to either a dispositional factor (e.g., political ideology, group identification) measured by an individual respondent's self-report or an experimental manipulation that was short-lived and experienced alone (e.g., reading a norm-based message).

Obviously, processes that truly happen between individuals and among members of a group were rarely studied. For example, we found no research in social psychology journals dedicated to how individuals share or communicate climate-change-related information with each other or how climate-change-related attitudinal or behavioural norms evolve among members of a group or community over time. There was also a lack of attention to mutual influences among family members, friends and peers, coworkers, schoolmates, neighbours, and so on, or how people in these different kinds of relationships jointly cope with the impacts of climate change. In this regard, we concur with the suggestion by Batel *et al.* (2016) that social psychologists interested in climate change and other environmental issues need to expand their theoretical scope by considering the perspectives of evolving social relationships, social representations, and social practices. Recent contributions in critical psychology should also be considered (Adams, 2021).

We also encourage social psychologists to integrate insights from socioecological psychology into their

climate-change-related investigations. Social psychologists are no stranger to the powerful force of situations and contexts but are typically interested in people's perception or construal of situations and contexts. Socioecological psychology is aimed to reintroduce the objectivist perspective to psychological theorisation. It reminds us of the role played by objective social and physical environments in human thinking, feeling, and behaviours (Oishi, 2014). In fact, climate change research in the area of environmental psychology and other social sciences has long-recognised the significance of objective contexts in people's responses to environmental problems. For example, the objective problem and subjective value theory in political science research highlights that people's environmental concern may stem from their personal experience of objective environmental problems (Inglehart, 1995). Findings have shown that objective indicators of national vulnerability to climate change impacts can predict not only people's environmental concern and climate action but also stringency of a country's climate policy (Givens & Jorgenson, 2011; Hao & Shao, 2021). A recent article by Tam (2020) revealed that while people's motivations (e.g., postmaterialist values) matter in whether they would engage in climate activism, the size of the effect of motivations depends on the objective political contexts of a country (e.g., democracy, density of environmental nongovernmental organisations). Based on these examples, we argue that in future research, social psychologists should pay attention to not only subjective, intrapsychic processes but also to the significance of objective contexts. In such research, multilevel theories and data analyses will be useful (Tam & Milfont, 2020).

Concluding Remarks

With this systematic review, we offer our assessment of the social psychological literature of climate change. We applaud our peers for the impressive canon of research they have produced on this pressing topic. We also want to raise awareness of the three major issues we have identified and offer our suggestions on how these issues can be addressed in future research. Due to limited space, we cannot elaborate on the many other issues that we have identified, such as lack of qualitative investigations, attention to digital data, and studies on climate change discourse in the general public. We refer readers to related discussions (Clayton *et al.*, 2015; Clayton & Manning, 2018; Fielding *et al.*, 2014).

Climate change is an epic global challenge facing humanity. Our fight against it requires behavioural change and social change. For this reason, social psychology can make a difference. We call upon social psychologists to continue their engagement with this issue and to contribute conceptual and empirical tools that can

increase our chance of surviving the challenge of climate change.

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Data availability statement

Data sharing is not applicable to this article as no original data sets were generated or analysed.

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- *Items marked with an asterisk denote the 80 articles reviewed and listed in Table 1.
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